Summer 2023

Effects of a Self-Monitoring Tracking System Combined With Blended Learning Intervention Time on Students' Self-Regulated Learning Skills And Academic Performance

Jennifer E. Augustine

EFFECTS OF A SELF-MONITORING TRACKING SYSTEM COMBINED WITH BLENDED LEARNING INTERVENTION TIME ON STUDENTS' SELF-REGULATED LEARNING SKILLS AND ACADEMIC PERFORMANCE

by

Jennifer E. Augustine

Bachelor of Arts
University of Florida, 2015

Master of Arts
University of South Carolina, 2018

Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Education in

Educational Practice & Innovation

College of Education

University of South Carolina

2023

Accepted by:

Fatih Ari, Major Professor

Tammi D. Kolski, Major Professor

Ismahan Arslan-Ari, Committee Member

Michael Grant, Committee Member

Anna Clifford, Committee Member

Ann Vail, Dean of the Graduate School

DEDICATION

First, I would like to dedicate this work to my husband, Matthew, who never doubted me for a second and backed me through my most challenging and stressful times. Also, to my dad, who began calling me Dr. Augustine well before I had earned the title and has always ended most of our phone calls with, “You know I’m proud of you, right?” Additionally, to Dr. Elizabeth Florence, my friend and colleague who gave me the confidence to begin my doctoral work and was always a text away for assistance and reassurance. Finally, I dedicate this work to my grandma, Dianne, for always supporting me and believing in me during her lifetime. I wouldn’t be half the student or woman I have become without her.

ACKNOWLEDGEMENTS

I would like to thank Dr. Tammi Kolski for her tireless effort in guiding me through my dissertation and being one of my biggest fans throughout my work. Her work and support allowed the hardest years of my doctoral program to be ones that were full of joy rather than existential dread. I would also like to thank Dr. Fatih Ari for his help in being a critical eye during the design and analysis of my study.

ABSTRACT

The purpose of this action research was to evaluate the effects of the implementation of blended learning combined with a self-monitoring achievement system on students' self-regulated learning (SRL) skills and academic performance in an eighth-grade English language arts classroom. SRL has been linked to higher academic achievement and success in and out of school. However, many students lack SRL skills, especially at the middle school level. This study addressed three research questions in order to better understand how students' SRL skills and academic performance could be improved: (1) How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?, (2) How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?, and (3) How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?. This study sought to implement and evaluate an intervention using a researcher-developed Self-Monitoring Tracking System (SMTS) in combination with blended learning in order to improve students' SRL skills and encourage them to perform at higher academic levels. Students tracked their academic performance using the SMTS and were then provided with blended learning intervention time. Study participants were 45 eighth-grade students in

an English language arts class within Branch Middle School, in Southeast Minnesota. Quantitative data collection was collected from the Motivated Strategies for Learning Questionnaire, Student Engagement and Experience Inventory, course grades, number of missing assignments, and frequency of reassessment and extension. Qualitative data included focus group interviews and open-ended student responses. Findings revealed that the intervention did not have a positive impact on students' SRL skills. However, the intervention did have a positive impact on students' performance on coursework and their experiences in the class. Answers to the research questions, themes, and the value of the intervention for future use in middle school classrooms is discussed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ELO ..... Essential Learning Objective

LFM ..... Learning for Mastery

MSLQ ..... Motivated Strategies for Learning Questionnaire

MTSS ..... Multi-tiered Systems of Support

PLC ..... Professional Learning Community

SEEI ..... Student Engagement & Experience Inventory

SMTS ..... Self-monitoring tracking system

SRL ..... Self-regulated learning

CHAPTER 1

INTRODUCTION

National Context

Public schools in America are filled with students of different backgrounds and academic abilities. While this is a beautiful reflection of the diversity that exists in America, it has also created challenges for schools across the country that have failed to meet the needs of their diverse student populations at both high and low academic ability levels. This problem led to the passage of the No Child Left Behind (NCLB) in 2002 and later to the Every Student Succeeds Act (ESSA) in 2015. Although both of these acts were designed to assist low-income and special education students, they underscore the need to address students varied educational needs in order for them to succeed in school and in their adult lives (U.S. Department of Education, 2020). Government policy that focuses on students of lower academic abilities also highlights the need for educational practices that consider students of higher academic abilities as well, both groups of students are deserving of instruction that meets their specific needs. The practice of differentiated instruction has been promoted by practitioners and policymakers as a way to ensure all students are mastering the required content and has become a baseline expectation for educators across the country (Dixon, Yssel, McConnell, & Hardin, 2014; Tomlinson, 2008).

However, educators often find that the parameters of class time and large class sizes do not afford enough in-class time to address these diverse needs and that reaching

students at varying levels is difficult to put into practice (Altemueller & Lindquist, 2017; Engel, Heinz, & Sonntag, 2017). Furthermore, educators are tasked with preparing students for life beyond school as part of the College and Career Ready Standards, which were designed to give students the higher-order skills that students need to think critically, solve real-world problems, and be successful in the 21st century and beyond (Mishkind, 2014). This means that educators need to make instruction accessible for varying academic abilities but also help students to build the skills that they will need to be lifelong learners and be successful in their adult lives.

For this to happen, students need to possess self-regulated learning (SRL) skills, which assist them in actively participating in the learning process and engaging metacognitively (Zimmerman, 1986, as cited in Broadbent, 2017). SRL has three distinct components, including metacognitive strategies such as planning; management of effort such as time management, effort regulation, peer learning, and help-seeking; and cognitive strategies such as rehearsal, elaboration, organization, and critical thinking (Pintrich, Smith, Garcia, & McKeachie, 1991, as cited in Broadbent, 2017). SRL skills are crucial to students finding success in school and in professional life (Uz & Uzun, 2018; What Works Clearing House, 2017; Zhu, Au, & Yates, 2016). Additionally, students with more highly developed SRL skills have a greater potential for high school graduation (Meyers, Pignault, & Houssemand, 2013).

Although research has shown SRL skills to have a positive impact on student learning, these skills are not often explicitly taught or reinforced. To add on to this, traditional lecture-style instruction creates a teacher-regulated environment that does not position students to use and grow their own SRL skills, as these environments position

students to be more passive in their learning, and self-regulation occurs when students are behaviorally, cognitively, metacognitively, and motivationally involved in their own learning (Zimmerman, 2011). Classes in which students learn the exact same way at the exact same pace do not leave room for students to expand their SRL skills and do not effectively reach different academic abilities (Zimmerman, 2002). Several studies have shown that the use of blended learning can improve students' SRL skills (Boekaerts, Pintrich, & Zeider, 2000; Broadbent, 2017; Pilling-Cormick & Garrison, 2007; Tsai, 2011; Uz & Uzun, 2018; Van Laer & Elen, 2017; Zhu et al., 2016) and create a learning environment that is more flexible and can accommodate for learners of varying abilities and backgrounds (Brodersen & Melluzzo, 2017; Kleber, 2015). In combination, SRL skills and blended learning create an environment in which students can develop skills and navigate content in a way that is in line with their interests and academic abilities, allowing them to achieve at a level that is closer to their individual potential.

Connecting SRL skills to blended learning as a means to cater to varying academic abilities and backgrounds has not been extensively studied. The existing research instead focuses on interventions for either students of low academic ability or gifted and talented students, but not both, despite the fact that both groups are underachieving when it comes to their individual potential (George, 2012). Additionally, there is little research regarding the systematic use of blended learning that encourages students to review content and skills they did not understand and then reassess, as well as to extend learning beyond grade level if they understand content and skills more quickly than their peers. Classrooms will continue to be filled with diverse learners and class sizes are not likely to be reduced so dramatically that addressing these varying academic

abilities will become an easy task. In order to meet the needs of current and future students, more research needs to be done to identify specific strategies that can improve students' SRL skills. A blended learning strategy can become a method by which students are given the opportunity to learn in a self-paced manner while promoting mastery of content and skills for the greatest number of students possible.

Local Context

The school in which I conducted this study is located in Southeast Minnesota. The town has a population of about 5,700, with 96.3% of the population identifying as white, 2.3% identifying as Asian, 0.4% identifying as Hispanic or Latino, and 1.2% identifying as two or more races (United States Census Bureau, 2019). Only 3.5% of the population is foreign-born, and only 3.7% of the population speaks a language other than English at home (United States Census Bureau, 2019). The median value of owner-occupied housing units between 2014 and 2018 was $199,600 and 87.8% of these housing units were owner-occupied (United States Census Bureau, 2019). 96.6% of homes have a computer and 88.4% have a broadband internet subscription (United States Census Bureau, 2019). Of persons 25 years of age or more, 97.4% have a high school diploma, and 43.7% hold a bachelor's degree or higher (United States Census Bureau, 2019).

The city is serviced by a single school district and contains early learning programs, two elementary schools (grades K-2 and 3-5), one middle school (grades 6-8), and one high school (grades 9-12). Total enrollment for the district is 2,114, with 91.3% of students identifying as white, 3.1% identifying as Hispanic or Latino, 1.8% identifying as Asian, 0.7% identifying as African American, 0.2% identifying as American Indian, and 2.8% identifying as two or more races ([redacted] Public Schools, 2020). 10.5% of

students are enrolled in the free and reduced lunch program, 10.5% receive special education services, and 0.4% are homeless ([redacted] Public Schools, 2020). The racial and socioeconomic demographics of the city are vastly different from those that initiatives like NCLB and ESSA targeted, which makes this city a unique location for an intervention that targets underachieving students.

Many students that do not live in the district boundaries choose open enrollment in order to attend Branch Public Schools. The state of Minnesota allows students to enroll in public schools that are outside of their residence without a tuition charge (Reinhardt, 2017). Since this policy was adopted, the Branch school district has seen an increase in open-enrolled students each school year (Reinhardt, 2017).

One of the reasons for this trend may be the unique educational practices that the district has put in place. Branch Public Schools uses a standards-referenced grading system. The district promotes the use of this system because it provides teachers with direct feedback on how students are performing in various areas and allows for better differentiation of instruction to meet students' needs ([redacted] Public Schools, 2020). This particular grading system does not use standard letter grades but rather numerical scores ranging from 1-4, where 1 refers to "cannot complete without teacher support, 2 refers to "can complete with some teacher support", 3 refers to "can complete independently", and 4 refers to "extends skill or knowledge beyond grade level". Students are scored on their performance on individual standards, which is designed to allow teachers to provide specific interventions when students are struggling in a certain area or have shown the need for more advanced material. In line with a state initiative, Multi-tiered Systems of Supports (MTSS), the goal of standards-referenced grading in Branch schools is to

provide all students with evidence-based instruction in order for all students to achieve proficiency in skills and content (Minnesota Department of Education, 2020). This grading system is also set up to allow for high-achieving students to move beyond grade-level content if they are progressing at a pace that is faster than their peers.

Despite the vision behind both the standards-referenced grading system and MTSS, the reality at the middle school is that large numbers of students were not reaching the grade-level score of 3 and were not reviewing content and reassessing in order to attain this score. Additionally, few students who were capable of higher-level academic work attempted the level 4 score. In my own class during the same academic year, only about 4% of students regularly attempted a level 4 score, despite the fact that a much higher percentage of my students were capable of this higher level of work. Although there are systems in place to support students in reassessing and extending their content knowledge and skills, students were not frequently doing either of these things, and a large number of students were not reaching proficiency and are underachieving at their individual potential, underscoring the need for an intervention that focuses on all academic ability levels and attempts to help students build their SRL skills.

Statement of Problem

Eighth-grade students at Branch Middle School in Southeast Minnesota lack SRL skills in English language arts and therefore are not taking re-assessment opportunities or are not extending themselves to their academic potential.

Purpose Statement

The purpose of this action research was to evaluate the effects of the implementation of blended learning interventions combined with a self-monitoring

achievement system on students' SRL skills and academic performance in an eighth-grade English language arts classroom at Branch Middle School.

Research Questions

The following research questions will guide this study.

1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?

Statement of Research Subjectivities and Positionality

For the duration of this study, I was a middle school teacher working in a rural town in southeast Minnesota. However, I am a middle-class white female from a suburban area in South Carolina, which has a vastly different cultural and socioeconomic landscape. I decided to pursue a graduate degree in educational technology because I saw it as a viable way to improve my effectiveness as a classroom teacher, especially as more and more classrooms adopt technology as a way to enhance or facilitate learning (Alexiou-Ray, Wilson, Wright, & Peirano, 2003). My core belief about educational technology is that it should be used as a tool to enhance learning or to solve an educational problem that is difficult to solve using traditional methods (Januszewski &

Molenda, 2008). My desire to advance my skills with educational technology partially stemmed from observing educators using technology as a replacement for instructional strategies rather than as an extension of them. I do not believe that the end goal of educational technology should be to reproduce teaching methods that are already in use. It is my belief that educational technology should be a tool to open doors to new teaching methods and practices.

Because of my beliefs about educational technology, I chose to work from the pragmatic research paradigm because it is centered on solving problems and going about research in a way that is most practical and helpful to the researcher. I specifically identified with the facets of early pragmatism, which support "working hypotheses, rules of thumb, and even well-proven instruments are open to revision under appropriate circumstances" (Hickman, 2007, p. 53). The research that I conducted was aimed at being useful to myself as an educator but also to my students, and this aspect of pragmatism allowed me to be flexible as a researcher in my search for a solution that could solve my particular problem in my particular setting (Hickman, 2007).

My positionality within my research was as an insider because I was studying my own teaching practice (Herr & Anderson, 2005). I applied an educational intervention and collected data within my own classroom in order to assess the effectiveness of the intervention. Even though this research model followed a traditional research setup, I did not act as an outside observer, and instead had a personal stake in the outcome of my study (Herr & Anderson, 2005). Additionally, as an action researcher, I had a responsibility to the research participants (my students), which impacted how I went about the research process (Zeni, 1998). It was my responsibility as a teacher to deliver

instruction to students in a way that will benefit them, and this undoubtedly changed my treatment of the intervention both in the creation and in the delivery stage. At the same time, I was also positioned as an outsider in relation to some of my students on the basis of race, sex, and/or socioeconomic status, which are differences that cannot be ignored (Peshkin, 1988). Although the majority of my students were white, I had students who were different from me racially, and many of my students came from a rural area and lower socioeconomic status than I am personally familiar with.

The most important action I needed to take in order to negotiate my positionality within my research context was to reflect on my own subjectivities and positionalities and to explicitly acknowledge these throughout the entire research process and in the final research report (Herr & Anderson, 2005; Peshkin, 1988). As Peshkin (1988) states, "one's subjectivity is like a garment that cannot be removed" (p. 17). Rather than trying to remove my garments of subjectivity and positionality, I needed to closely examine each and provide an explanation of them to both my research participants and to other stakeholders. Regarding my student participants, I needed to be upfront and honest with them about the purpose of my research and my vested interest in finding an educational intervention that would solve a problem of practice. This is something that I also needed to communicate with other stakeholders about, as such a vested interest could have potentially led me to put a positive spin on my data in order to support the intervention that I created (Herr & Anderson, 2005). One way to negotiate this aspect of my positionality was to have designated stakeholders review my research along the way or even observe my classroom as a form of an audit. I also needed to address the issue of the teacher-student power dynamic and make it clear both in words and in actions that my

participants would not receive academic or behavioral consequences or rewards as a result of their involvement, or non-involvement, in the study.

Finally, my personal values, experiences, and biases may have affected my research in both positive and negative ways. As a student that was served by the gifted and talented department throughout my K-12 education, I understand the need to provide instruction that matches the academic ability levels of individual students. At the same time, my experience teaching underachieving students has helped me to see that these students also need support in the areas of self-regulated learning skills in order to help them learn more independently and experience greater academic success. The combination of my personal and professional experiences and beliefs has set me up to create the best research intervention possible for my students. At the same time, because I have always been a high-achieving student and have had a high level of support in my academic endeavors, it may have been more difficult for me to understand and empathize with my under-achieving students, which could have negatively impacted my intervention and my interpretation of data. Additionally, my expertise in the field of teaching is not well developed. I had little experience in the classroom as a fifth-year classroom teacher at the time of this study, which could have resulted in me believing that my intervention was novel when it actually was not. Continually reflecting upon these aspects of myself was necessary in order to bolster the possible positive effects and minimize the possible negative effects.

Definition of Terms

Academic Performance: In this study, academic performance was used to refer to students' course grades in English language arts. These course grades provided what Barnes (2015) refers to as a story reflecting students' knowledge base and growth. Students received a score on each assignment that they completed during class, which communicated both to the students and to the teacher how students were understanding the current learning content and skills (Tomlinson & Moon, 2013). Academic performance was determined primarily through assessments that students completed in the context of the classroom. For the purpose of this study, assessment was defined as both formative and summative assessments that were tied to specific learning goals, as Marzano (2007) suggests. Because this study was examining students' skills and abilities with specific content and at short intervals of time, the term academic performance was used to delineate this difference. As this study sought to investigate how the intervention affected students' academic performance, students' grades on class assignments, both formative and summative, were collected in order to provide a "story" of how students were performing in my class. The grading system used in this intervention was a standards-based grading system, which can have a positive impact on learning outcomes and student motivation (Holder, 2015).

Blended Learning: Blended learning is the use of educational technology that allows students to learn at varying times, places, and paces via a hybrid of traditional and online teaching methods (Brodersen & Melluzzo, 2017; Fisher, Perenyi, & Birdthistle, 2021; Means, Toyama, Murphy, Bakia, & Jones, 2009; Melton, Graf, & Chopak-Foss, 2009; Truitt & Ku, 2018; Van Laer & Elen, 2017). Blended learning can take several forms, but

for the purposes of this research, it was defined by four characteristics: learning materials being made available online, face-to-face time being reserved for active learning, collaboration occurring between students, and assignments being submitted and returned online (Sockalingam, 2013). Blended learning can allow students to learn at different levels and become active participants in the learning process (Banerjee, 2011; Brodersen & Melluzzo, 2017; Fazal, Panzano, & Luk, 2020; Maeng, 2016; Picciano, 2009; Stevens, 2016; Swan et al., 2015). During the intervention time, students received different blended learning activities based on their specific academic needs. Additionally, blended learning was leveraged as a strategy to help students develop their self-regulated learning skills.

This positive relationship between blended learning environments and students' academic performance was the main reason that a blended learning intervention using principles of flipped learning was chosen for the intervention being used. Another main reason for choosing these learning environments is that they allow for smoother differentiation than traditional teaching models, which was an important part of the intervention as students were performing at different levels at different times.

Intervention Time: Because students existed at varying academic levels within one classroom, intervention time was used to address these differences and provide students with the supports necessary to influence their individual academic growth. An intervention is a system designed to match instruction to the learners' specific abilities (Dijkstra, Walraven, Mooij, Ton, & Kirschner, 2017). One class period per week was reserved for delivering specific interventions to students in order to assist them with

content or skills that they did not grasp during the original lesson or to give the students that were ready an above-grade-level challenge.

Reassessment and Extension: In this action research, reassessment and extension referred to students moving through different levels of learning after a baseline assessment. Branch Middle School uses a standards-referenced grading system in which students are graded on their progress within specific standards and learning objectives. Students were scored from 1-4, where 1 refers to "cannot complete without teacher support, 2 refers to "can complete with some teacher support", 3 refers to "can complete independently", and 4 refers to "extends skill or knowledge beyond grade level". Students were expected to review material and reassess if they did not earn a 3 on their first attempt at a task. Students that earned a 3 were encouraged to extend their learning and work with their teacher to earn a 4. This model follows some of the tenets of the mastery learning approach, in that the goal is for students to earn a 3 or master each of the standards. Additionally, students were provided with multiple opportunities to reassess and extend on assignments and were provided with alternative learning activities as needed, which aligns with the major tenets of mastery learning (Anderson 1976; Bloom, 1971; Caroll 1963; Ee, Yoeh, Boo, & Boulter, 2018; Morphew, Silva, Herman, & West, 2020; Palardy, 1987; Slavin, 1987). The mastery learning approach accounts for students learning at varying levels and paces and accommodates this diversity by providing extra support for students who are not progressing through content as quickly as their peers (Changeiywo, Wambugu, & Wachanga, 2011). This extra support was meant to encourage a student to reassess and demonstrate that they understood the specific standard and could move on to new content. Students that learned at a faster pace

were expected to use the time to extend their learning and work on an extension activity in order to move beyond grade-level expectations.

Self-Monitoring Tracking System: The self-monitoring tracking system (SMTS) was a digital document that students used to keep track of their progress on assessments in class. Effective learning requires that students make use of SRL skills to make adjustments and act on those adjustments (Martin et al., 2003). A major part of this process involves self-monitoring and tracking achievement. In this study, students self-monitored and tracked their progress on assignments in the class, including any reassessment and extension that they attempted. The SMTS was developed by this researcher based on common understandings of self-monitoring and tracking. Zimmerman (2002) defines monitoring as the action students take when they keep track of their performance and note signs of progress as they continue with their learning. Marzano (2007) more explicitly defines tracking as the act of visually charting progress over time.

Self-Regulated Learning: SRL involves the learner being an active participant in the learning process and being engaged metacognitively (Zimmerman, 1986, as cited in Broadbent, 2017). Other components that are included under the conceptual framework of SRL are the cognitive, metacognitive, behavioral, motivational, and emotional/affective components of learning (Panadero, 2017). Within each of these components are various skills and strategies that can be understood as a "toolkit" that allows learners to most effectively interact with learning content and experiences (Newman, 2002; Winne, 1996). For this research, Pintrich's (2000) model of SRL was used. Unlike other SRL authors, Pintrich's research on SRL and his subsequent models of

SRL have a heavy focus on the relationship between SRL and motivation (Pintrich, Marx, & Boyle, 1993; Pintrich, 2000). Pintrich's (2000) model divides SRL into four phases: (1) forethought, planning, and activation, (2) monitoring, (3) control, and (4) reaction and reflection. Each phase has four different regulation areas, including cognition, motivation/affect, behavior, and context. Specific SRL skills include metacognitive strategies for planning, monitoring, and modifying cognition, management and control of effort on classroom tasks, and cognitive strategies used to learn, remember, and understand learning material (Pintrich & DeGroot, 1990).

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this action research was to evaluate the effects of the implementation of weekly blended learning interventions combined with a self-monitoring achievement system on students' SRL skills and academic performance in an eighth-grade English language arts classroom at Branch Middle School.

Research Questions

The following research questions guided this study:

1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?

In order to find a potential solution to the problem of middle school students having underdeveloped self-regulated learning skills and not reaching their full academic

potential, this action research study investigated an intervention designed to boost self-regulated learning skills as well as academic performance.

To conduct this literature review, the variables and constructs involved in the study are first identified and isolated. These include: blended learning, assessment, reassessment and extension, differentiation, self-regulated learning, academic performance, tracking and self-monitoring, and the SMTS. For each of these variables and constructs, except for reassessment and extension and the SMTS, a search was conducted to locate both foundational literature and current studies that sought to measure or define the variables. Reassessment and extension and the SMTS are both original components of the study environment and/or the intervention being used, so they were not included in the literature search. The keywords used correspond to the variables and constructs including: blended learning, assessment, differentiation, SRL, academic performance, tracking, and self-monitoring. Additionally, some of these keywords were combined in order to locate literature detailing connections between them. These combinations include: blended learning and assessment, blended learning and SRL, blended learning and differentiation, blended learning and self-monitoring, SRL and self-monitoring, SRL and tracking, and SRL and differentiation.

This chapter is organized into two main sections: (1) theoretical background, and (2) background of intervention components. In the theoretical background section, (a) cognitivism, and (b) self-regulated learning will be defined and their relevance to this study will be explained. In the background of the intervention components section, the following elements will be defined and discussed: (a) blended and flipped learning, (b)

assessment, (c) mastery learning, and (d) tracking and self-monitoring. The connection between these sections and the intervention created for this study will be outlined.

Theoretical Background

In the following section, the theoretical backing of this study will be examined and discussed, including the cognitivism perspective from which this study was designed, and self-regulated learning, which is the primary variable of this study.

Cognitivism

This section will focus on the learning theory of cognitivism. Definitions of the learning theory will first be presented. Then, the relationship between cognitivism and the intervention being used in this study will be discussed and explained.

Cognitivism is a learning theory that evolved out of behaviorism around the 1920s and began to make its mark in educational psychology around the 1950s (Harasim, 2012; Yilmaz, 2011). While behaviorists focused solely on observable behaviors, cognitivists shifted attention to the "importance of the mind in making sense of the material world" (Harasim, 2012, p. 12). The behaviorist view of the learner as passive was replaced by the cognitivist view of the learner as an active participant in the acquisition of knowledge (Woolfolk, 2015).

Cognitivists look to observable behaviors to deduce what is going on inside the subject's mind (Gage & Berliner, 1988; Yilmaz, 2011). Proponents of cognitivism viewed the mind as a computer, and they recognized that mental processes are taking place and are required for learning and knowledge retention (Harasim, 2012; Yilmaz, 2011). Learning, according to cognitivists, is not just a response that learners have to environmental cues. Although these cues are still important, the way the learner interacts

with these cues is equally important (Ertmer & Newby, 1993). Additionally, cognitivists are interested in how learners process environmental cues, and learners' thoughts, attitudes, beliefs, and values also have importance in understanding the learning process.

Cognitivism places special attention on how knowledge is acquired, processed, stored, retrieved, and activated throughout various phases of the learning process (Anderson, Reder, & Simon, 1997; Ertmer & Newby, 1993). Additionally, cognitivism recognizes that mental processes can be both taught and learned and that people do not always respond to environmental stimuli in the same way, as their mental processes can vary from one to the next (Anderson et al., 1997; Matlin, 1994). Because of this, cognitivism is a better fit when dealing with more complicated learning tasks.

While the aforementioned tenets of cognitivism are generally agreed upon, the field of cognitivism has expanded since its conception such that there is no single definition of cognitivism that is accepted by all cognitivist theorists. The following paragraphs will address various offshoots of cognitive theories of learning.

Information processing theories exist under the umbrella of cognitivism and largely deal with how learners interact with environmental events, encode information to be learned, relate that information to existing information in their memory, store new knowledge, and retrieve it when needed (Shuell, 1986). Information processing theories commonly use a computer information processing analogy to describe the functions of cognition. Receiving new information is viewed as input, storing information is viewed as coding, and retrieving that information when directed to do so is viewed as output (Shuell, 1986). This understanding of cognitivism is best applied to learning situations in which students need to learn and recall specific information.

Another subset of cognitivism is cognitive load theory, which begins with the presumption that learners can only process a certain amount of information at one time because of the limits of perception, attention, and working memory (Schunk, 2012). The focus of cognitive load theory is to help learners efficiently transfer information from short-term to long-term memory in order to bypass the limitations of information storage in short-term memory (Sweller, 2011). To reduce cognitive load, instructors can use schema and scaffolding.

SRL, similar to other theories of cognitivism, places students as active participants in the learning process. Participation involves showing initiative, perseverance, and adaptive skills while working through instruction (Zimmerman, 2011). SRL theories assume that students can personally improve their ability to learn by selectively using metacognitive and motivational strategies that students can create for themselves learning environments that will most benefit their personal learning process, and that students play a large role in deciding the type and the amount of instruction they need (Zimmerman, 2011). Under SRL theories, attention is focused on the mental processes of the student and how the student chooses to guide his or her own learning experiences.

Self-Regulated Learning

I have chosen to focus on SRL skills in this study because these are the skills that I have observed students most severely lacking in my experience in the classroom. Especially under a grading system where learning is conceptualized as ongoing and students are expected to reassess and extend on learning material throughout the year, these skills are extremely important. When students possess well-developed SRL skills,

they typically perform better in school (Pape, Zimmerman, & Pajares, 2002). Past studies have shown that SRL and its various components are among important differences between successful students and low-achieving students (Borkowski & Thorpe, 1994). Overall, self-regulation, self-efficacy, and test anxiety are large predictors of student performance (Pintrich & De Groot, 1990). Students with more developed SRL skills tend to have higher academic performance and make improvements from formative to summative assessments (Broadbent, Sharman, Panadero, & Fuller-Tysziewicz, 2021; Chang, 2005; Zhu et al., 2016). Additionally, students with more developed SRL skills have greater confidence in their abilities and are more challengeable (Chang, 2005).

In the following section, SRL will be defined. Additionally, various components of SRL skills will be laid out, teaching methods used to develop SRL skills will be discussed, and the relationship between SRL skills and the cognitivism learning theory will be examined. Research methods used to measure SRL skills will be presented at the end of the section.

Self-regulated learning definition. SRL is a conceptual framework that includes the cognitive, metacognitive, behavioral, motivational, and emotional/affective components of learning (Panadero, 2017). SRL first started to be distinguished from metacognition by researchers such as Zimmerman (1986) and Pintrich, Marx, & Boyle (1993) (as cited in Panadero, 2017). SRL can be thought of as a "toolkit" of tactics and strategies that allow learners to engage with instruction and adapt in order to most effectively learn in varying situations (Newman, 2002; Winne, 1996). SRL skills are broadly defined as the skills that learners use to plan, set goals, and utilize various strategies to achieve those goals (Broadbent et al., 2021; Zimmerman, 2000). Another

leading definition of SRL is proposed by Pintrich and DeGroot (1990) and is based on previous work by Corno (1986) and Zimmerman and Martinez-Pons (1986). Pintrich and DeGroot (1990) point to three important components of SRL, including strategies for planning, monitoring, and modifying cognition; managing and controlling effort on academic tasks; and the actual strategies that students utilize to learn, remember, and understand the learning material.

These three components were expanded on in Pintrich's (2000) model of SRL. Pintrich's (2000) model features four phases of SRL: (1) forethought, planning, and activation, (2) monitoring, (3) control, and (4) reaction and reflection (Pintrich, 2000). Each phase has four different regulation areas, including cognition, motivation/affect, behavior, and context (Pintrich, 2000).

Self-regulated learning models. In this section, different models of SRL will be presented, including Zimmerman's (2000) model, Boekaerts's (1988) model, Winne and Hadwin's (1998) model, and Pintrich's (2000) model. For the purpose of this study, Pintrich's (2000) model will be used.

A prevalent understanding of SRL is based on Zimmerman's (2000) model which defines students with SRL skills as being cognitively, motivationally, and behaviorally active participants. Zimmerman was one of the first researchers to publish about SRL and attempt to explain the factors that influence SRL, with his first publication on SRL in 1986 (Panadero, 2017). Zimmerman developed and published three models of SRL, but the second model he developed, the cyclical phases model, is what he is most known for (Panadero, 2017). Zimmerman's (2000) model contains three phases: forethought, performance, and self-reflection. In the forethought phase, students analyze the task, set

goals for themselves, plan how to reach the goals, and begin to activate learning strategies (Zimmerman, 2000). In the performance phase, students do the task. During this phase, they also monitor their own progress and use various self-control strategies in order to keep them on track to set their goals and stay motivated (Panadero, 2017). In the self-reflection phase, students assess their own performance on the task and provide reasoning for their successes or failures (Panadero, 2017).

Boekaerts was another early contributor to the SRL field, with a contribution to SRL literature in 1988. Boekaerts' (1988) work with SRL was more focused on the role that goals play in SRL (Beokaerts, 1988). Like Zimmerman, Boekaerts also developed more than one SRL model. The first model divided self-regulation into six components: (1) domain-specific knowledge and skills, (2) cognitive strategies, (3) cognitive self-regulatory strategies, (4) motivational beliefs and theories of mind, (5) motivation strategies, and (6) motivational self-regulatory strategies (Boekaerts, 1988). Boekaerts later developed the Adaptable Learning Model, which later evolved into the Dual-Processing Self-Regulation model (Boekaerts, 2011). This SRL model puts emphasis on emotions, as it supposes that there are three different purposes for SRL: (1) expanding knowledge and skills, (2) preventing threat to the self and loss of well-being, and (3) protecting one's commitment to the learning activity (Boekaerts, 2011). These purposes for SRL are related to two different processing modes: a mastery or learning mode, and a coping or well-being mode, which underscores the importance that positive and negative emotions can play in SRL (Boekaerts, 2011).

In 2011, Winne and Hadwin developed an SRL model that leans heavily on the metacognitive perspective (Panadero, 2017). This model was based on previous work by

Winne in the late 1990s. According to the Winne (2011) model, SRL facilitates studying across four phases that are linked together. The four phases are task definition, in which students generate an understanding of the task to be completed; goal setting and planning, in which students form goals and create a plan to achieve those goals; enacting study tactics and strategies, in which students complete actions necessary to achieve their goals; and metacognitively adapting studying, in which students complete the task and make long-term adjustments to their motivations, beliefs, and strategies for future learning and task completion (Winne, 2011). This model strongly roots all four phases in cognitive activities and explains how students use cognitive processing while planning, performing, and evaluating tasks (Panadero, 2017).

The final SRL model discussed in this section is that of Pintrich (2000), which is one of the most widely used models of SRL, second to Zimmerman's (2000) model (Panadero, 2017). Pintrich's work on SRL focuses on the relationship between motivation and SRL (Pintrich et al., 1993). In Pintrich's (2000) SRL model, four phases of SRL are identified: (1) forethought, planning, and activation, (2) monitoring, (3) control, and (4) reaction and reflection. Each phase has four different regulation areas, including cognition, motivation/affect, behavior, and context. These four areas make Pintrich's (2000) model one of the more comprehensive models of SRL, as it does not narrow its focus towards mainly cognitive or mainly behavioral areas as other models do. Additionally, Pintrich's (2000) model of SRL is tied to his original questionnaire, the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1993), which is widely used in current research (Roth, Ogrin, & Schmitz, 2016). Because of the broadness of Pintrich's (2000) model and the common use of the MSLQ in research

focused on SRL, Pintrich's (2000) model of SRL and his MSLQ was used to guide this study.

Self-regulated learning and cognitivism. Focusing on SRL is in line with the cognitivism learning theory, which was chosen as the theoretical framework for this study. Most models of SRL stem directly from cognitivism thinking. Cognitivism places emphasis on mental processes and how learners interact with learning material. One of these mental processes is goal setting, which is an important aspect of SRL skills (Ertmer & Newby, 1993; Kitsantas, Reiser, & Doster, 2004; Zimmerman, 2002). Cognitivism also emphasizes that the environment plays a large role in facilitating learning, which is related to findings that students' self-monitoring typically increases as task importance increases (Ertmer & Newby, 1993; Lan, 2005). Under the cognitivism learning theory, the focus is put on how students receive, organize, store, and retrieve information from the mind (Ertmer & Newby, 1993). Similarly, SRL skills are heavily tied to metacognition and the awareness of one's own thinking and mental processes (Zimmerman, 2002).

Self-regulated learning research methods. In past studies, quantitative measures have commonly been used to assess SRL skills, and quantitative self-reports questionnaires are one of the most common methods of measuring SRL (Wolter & Won, 2018). Data such as grades, grade point average, and emotion regulation measured using quantitative scales were typically collected (Barber, Bagsby, Grawitch, & Buerck, 2011). There are several research studies using quantitative measures to assess SRL in the literature. They are outlined in Table 2.1. In addition to these measures, tallying of

learning strategies can also be used to quantitatively assess SRL (Wilson & Narayan, 2016).

Table 2.1 *Self-Regulated Learning Quantitative Measures*

Measure	Description	Citations
Motivated Strategies for Learning Questionnaire (MSLQ)	This instrument contains two primary sections: a motivation section and a learning strategies section. The learning strategies section contains three types of scales: cognitive, metacognitive, and resource management. There are two versions of the MSLQ, one that is intended for use with higher education students (Pintrich et al., 1993), and one that is intended for use with high school students (Pintrich & DeGroot, 1990).	Broadbent et al., 2021; Chang, 2005; Pintrich & DeGroot, 1990; Pintrich et al., 1993
Students' Motivation Questionnaire (SMOQ)	The SMOQ is a 28-item self-report survey. Each item is constructed using a 5-point Likert scale. The questions for this survey are based on the ARCS model of motivation. This instrument has a reliability coefficient of 0.76 (Changeiywo et al.).	Changeiywo et al., 2011
Self-Regulation Trait Questionnaire	This instrument was developed based on Zimmerman's model of self-regulation. The questionnaire consists of 32 Likert-scale questions and seeks to measure metacognition and motivation. There are two subscales within these dimensions: planning and self-monitoring under the metacognition dimension, and effort and self-efficacy under the motivation dimension (Herl, O'Neil, Chung, & Schacter, 1999).	Designed by O'Neil and Herl (1998, as cited in Ghanizadeh, 2017)
MOOC Online Self-regulated Learning Questionnaire (MOSLQ)	This instrument is a 19-item scale with a 5-point Likert scale. Dimensions of the MOSLQ include goal setting, task strategies, time management, environment structuring, help seeking, and self-evaluation (Onah, Pang, & Sinclair, 2020).	Onah et al., 2020

Measure	Description	Citations
Self-Directed Learning Readiness Scale	This instrument was developed specifically for nursing education contexts. It is comprised of 42 items and contains three subscales: self-management, desire for learning, and self-control (Fisher, King, & Tague, 2001).	Fisher et al., 2001

Qualitative measures have also been used to assess SRL, which typically take the form of student interviews to assess students' self-monitoring (Lan, 2005; Zimmerman & Martinez-Pons, 1990). Lan (2005) utilized three open-ended questions to learn more about students' learning and study strategies. The questions used were: (1) "How do you know when you are ready for the classes?", (2) "How do you know when you are ready for the quiz?", and (3) "How do you know you are ready for the final exam?". Zimmerman and Martinez-Pons (1986) utilized a structured interview to obtain qualitative data regarding students' SRL strategy use. During the interview, students had eight different learning contexts described to them and were asked to provide strategies that they would use in each context. An example of one of these questions reads: "Assume your teacher is discussing with your class the history of the civil rights movement. Your teacher says that you will be tested on the topic the next day. Do you have a method that you would use to help you learn and remember the information being discussed? What if you are having trouble understanding or remembering the information discussed in class?" (Zimmerman & Martinez-Pons, 1990). Another common qualitative method to assess SRL is think-aloud protocols, in which participants verbalize their thought processes and what they are doing while completing a task (Greene, Deekens, Copeland, & Yu, 2018). Using think-aloud protocols has given researchers more detailed

insight into learners' decision making, as well as their cognitive and metacognitive processes (Azevedo, 2005; Fox, 2009; Schellings & Broekkamp, 2011)

In some studies, mixed methods were used to assess students' SRL (Onah et al., 2020; Zhu et al., 2016). In the Onah et al. (2020) study, quantitative results were first obtained using the MOOC Online Self-Regulated Learning Questionnaire (MOSLQ). Then, focus group interviews were conducted to capture more in-depth information about students' SRL strategy use (Onah et al., 2020). The Zhu et al. (2016) study utilized several data sources, including a quantitative questionnaire survey on the participants' self-control and self-regulated learning that was given at the beginning of the study. During the study, researchers collected qualitative data consisting of weekly reports about the participants' course experiences, and their contributions to the online forums. At the end of the study, researchers collected quantitative course grades (Zhu et al., 2016).

Direct self-regulated learning instruction. Direct SRL instruction occurs when teachers explicitly teach and explain SRL strategies to students, how to use those strategies, and what individual skills are connected to those strategies (Chamot, 2018; Zimmerman, 2008). Best practice for explicitly teaching SRL skills involves (a) introducing the SRL strategy by defining it and modeling it, (b) explaining why the strategy works, (c) explaining how the strategy can be useful in other contexts, and (d) providing opportunities for students to perfect the strategy via practice (Kiewra, 2002; Pressley & Woloshyn, 1995). Explicit teaching of critical thinking skills and SRL skills is related to better academic performance and completion of school (Ghanizadeh, 2017; Kistner et al., 2010; Meyers et al., 2013). Additionally, past studies have found that direct and explicit teaching of SRL skills and strategies is more successful in helping students

become self-regulative (Dignath & Büttner, 2018; Levy, 1996; Paris & Paris, 2001; Schunk & Ertmer, 2005).

Other impacts on self-regulated learning. Pass-fail grading can foster better SRL skills than traditional grading (White & Fantone, 2010). Pass-fail grading systems can lower competition and support collaboration, as well as foster intrinsic motivation, all of which are important factors of self-regulated learning (White & Fantone, 2010). Other learning environments that have been shown to promote SRL growth are self-directed learning, team-based learning, and problem-based learning environments (Lin, 2019; Loyens, Magda, & Rikers, 2008; Pilling-Cormick & Garrison, 2007).

Background of Intervention Components

The intervention that was created for this study involves both blended learning intervention time and the researcher-created SMTS. Several teaching and learning strategies were drawn from in order to create this intervention, including (1) blended learning, (2) assessment, (3) mastery learning, and (4) tracking and self-monitoring. In the following section, each of these components will be defined and their relation to the intervention will be explained.

Blended Learning

Blended learning is understood to be an instructional model "in which instruction occurs through a combination of face-to-face instruction and online learning" (Brodersen & Melluzzo, 2017, p. 3). Graham (2006) refers to the online portion of blended learning as "computer-mediated instruction", which illustrates the flexibility of the blended learning model to be adapted into various educational settings. The conception of the blended learning environment as a hybrid between face-to-face and online instruction is

ubiquitous throughout the literature (Fisher et al., 2021; Means et al., 2009; Melton et al., 2009; Van Laer & Elen, 2017). A key component of blended learning is that the online portion of the course becomes a natural extension of the physical class environment (Falconer & Littlejohn, 2007; Fisher et al., 2021). Because of this, blended learning formats allow instructors to reap the benefits and convenience of online environments without losing the social and in-person contact that can be a large part of the educational process (Banerjee, 2011; Melton et al., 2009).

In the existing literature, blended learning models can take various forms, and range from mimicking face-to-face instruction in which students are progressing through the same material at the same pace to offering students the ability to work at different paces or allowing for differentiated instruction and activities (Brodersen & Melluzzo, 2017). As technology has become more advanced, the definition of blended learning has come to encompass the use of adaptive technology to offer more personalized instruction (Fazal et al., 2020). However, blended learning includes a wide range of technologies and usages and therefore does not have any single specific definition when it comes to specific technology utilization (Van Laer & Elen, 2017). Oliver and Trigwell (2005) provide an even more flexible definition of blended learning, asserting that to be considered "blended" the learning environment needs to have two or more different aspects that are being mixed. Aspects that can be mixed are: the actual environment (online or face-to-face); media; context; theories of learning; learning objectives; and learning pedagogies (Oliver & Trigwell, 2005). Watson (2008) posits that blended learning can be conceived of as a spectrum, with one extreme end of the spectrum requiring students to complete all or most learning activities online, and the other end of

the spectrum requiring most of the learning to occur within the classroom with the integration of online resources. Other researchers have conceptualized blended learning as a model in which students access digital components within the classroom space (Cakir & Bichelmeyer, 2016; Hong, Hwang, Tai, & Kuo, 2016; Jou, Lin, & Wu 2016; Smith & Suzuki, 2015).

With or without the use of formal adaptive technology and regardless of how specifically technology is incorporated into the blended learning environment, many researchers have identified blended learning as a viable way to more easily incorporate differentiation and more personalized learning options via varied content, activities, or assessments (Banerjee, 2011; Brodersen & Melluzzo, 2017; Fazal et al., 2020; Maeng, 2016; Picciano, 2009; Stevens, 2016; Swan et al., 2015).

For the purposes of this study, blended learning referred to instruction that was delivered to students via online modules, which took place within the face-to-face classroom space. This aspect of the definition aligns with Falconer and Littlejohn's (2007) and Garrison and Vaughan's (2008) conception of the blended learning environment as a seamless ebb and flow between the physical and digital space, allowing for the instructor to enhance existing teaching practices by using the most convenient elements of both online and face-to-face instruction. Facilitating blended learning experiences within the classroom space aligns with the spectrum proposed by Watson (2008), is supported by the flexible definition of blended learning that Oliver and Trigwell (2005) provide, and is reflected in previous scholarship (Cakir & Bichelmeyer, 2016; Hong et al., 2016; Jou et al., 2016; Smith & Suzuki, 2015).

Blended learning and academic performance. A variable studied by many educational researchers is student learning and academic performance. In this section, the impact of blended learning environments on student learning and academic performance will be discussed, followed by a discussion of the methods commonly used to study these topics.

Many studies have shown that blended learning environments can have a positive impact on student learning and achievement (Alexandre & Enslin, 2017; Banerjee, 2011; Prescott, Bundschuh, Kazakoff, & Macaruso, 2018; Li & Wang, 2022; Truitt & Ku, 2018). In addition to increasing academic performance, blended learning has been shown to increase student satisfaction (Banerjee, 2011; Melton et al., 2009; Truitt & Ku, 2018). Despite the many studies linking higher student achievement to blended learning environments, Fazal et al. (2020) found that blended learning is most effective when it is used to offer differentiated instruction to students. Taking advantage of online learning activities can allow for classroom time to be freed for differentiated activities and more individual student support (Matamoros, 2016; Winter, 2018). Utilizing blended learning and blended learning stations can aid in the planning and delivery of differentiated instruction (Banerjee, 2011; Brodersen & Melluzzo, 2017; Maeng, 2016; Stevens, 2016; Swan et al., 2015).

Blended learning models have been studied extensively at the higher education level (Bahri, Idris, Muis, Arifuddin, & Jibran Nidhal Fikri, 2021; Banerjee, 2011; Bonk & Graham, 2005; Broadbent et al., 2021; Edwards, Rule, & Boody, 2017; Garrison & Vaughan, 2008; Matamoros, 2016; Melton et al., 2009; Onah et al., 2020; Perrow, 2017; Shy & Chen, 2018; Sockalingam, 2013, Tsai, 2011; Uz & Uzun, 2018; Wilson &

Narayan, 2016; Zhu et al., 2020). A smaller proportion of studies evaluating blended learning address middle and high school level students, and of those, more studies address high school than middle school populations (Alexandre & Enslin, 2017; Jones, 2016; Prescott et al., 2018; Truitt & Ku, 2018).

In past studies, quantitative, qualitative, and mixed methods have been used to assess the effectiveness of blended learning environments. The efficacy of learning models is often measured using quantitative methods, such as course grades or assessments (Edwards et al., 2017; Fitriyana, Wiyarsi, Sugiyarto, & Ikhsan, 2021; Jones, 2016; Melton et al., 2009; Prescott et al., 2018; Smallhorn, 2017). Quantitative student satisfaction data gathered from course evaluation surveys are also commonly used to assess the effectiveness of blended learning (Melton et al., 2009). Observation tallying can be used to quantify learning difficulties observed during lessons when students are engaged with the blended learning format while in the classroom (Bahri et al., 2021). Qualitative methods, including case studies, are also used to evaluate learning environments (Jones, 2016; Swan et al., 2015; Truitt & Ku, 2018). Qualitative course evaluations can be used to assess student satisfaction with blended learning formats (Banerjee, 2011). Mixed methods studies are used to evaluate learning models using both testing and grade data and student interview responses (Say & Yıldırım, 2020; Uz & Uzun, 2018).

Blended learning and self-regulated learning. Blended learning has been shown to be more effective than traditional learning in reinforcing students' SRL skills (Bahri et al., 2021; Uz & Uzun, 2018; Van Laer & Elen, 2017). Self-monitoring and self-assessment, components of SRL, can positively affect critical thinking, which is a large

predictor of academic performance (Atkins, 2018; Ghanizadeh, 2017; McConnell, 1999; Wilson & Narayan, 2016). Completely online learning environments typically require students to have well-developed SRL skills in order to be successful in the course, whereas blended learning environments offer face-to-face support for students who may not already have advanced SRL capabilities (Marino, 2000). Additionally, this type of combination environment should allow for students to be supported in learning and using SRL skills while getting the independent practice that will help them further develop these skills.

Learning environments and self-regulated learning research methods.

Quantitative methods are commonly used to assess how learning environments impact SRL skills. Data collected includes grades, testing data, and SRL surveys (Shy & Chen, 2018). Mixed methods can also be used to assess the impact of the learning environment and SRL (Bahri et al., 2021; Onah et al., 2020; Uz & Uzun, 2018; Zhu et al., 2016).

Assessment and Academic Performance

Another variable commonly studied in terms of its impact on student learning and academic performance is assessment. In this section, assessment will first be defined, then assessment will be discussed in terms of its roots in the cognitivism learning theory, and finally assessment will be explored in its relation to academic performance and differentiation.

Assessment definition. The term assessment is an umbrella term for a wide variety of data collection practices. Tomlinson and Moon (2013) refer to assessment as the "diagnosis" stage of instruction, during which the instructor gathers necessary

information before making a "prescription" or making important decisions about future instruction. Assessment can also refer to instructor-generated assessment or student-generated self-assessment. Instructor-generated assessment through the use of formative and summative assessments will be discussed here.

Formative assessment. Formative assessment is typically understood to be a feedback tool for both student and teacher use (International Reading Association, 2013; Marzano, 2007). Formative assessments can be used by teachers to adjust instruction based on student needs and can also be used by students to better understand their academic performance or mastery of a certain learning objective (International Reading Association, 2013; Tomlinson & Moon, 2013). Marzano (2007) classifies formative assessments as assessments given at the beginning of the learning process while students are still learning new skills and content.

Formative assessment can be further broken down into the categories of pre-assessment and ongoing assessment. Pre-assessment refers to data collection before instruction begins to help determine the knowledge and skills that students already have (Tomlinson & Moon, 2013). Ongoing assessment refers to formative assessments that are given throughout a unit of instruction to evaluate progress during a unit of study (Tomlinson & Moon, 2013).

Summative assessment. Summative assessment is typically understood to be the summation of students' learning and an indication of how well they grasped the learning content. Summative assessment is often given at the end of a unit of learning when students are ready to demonstrate what they know (Marzano, 2007). This is the stage of

instruction where students are more formally evaluated on what they have learned and the outcomes of instruction are assessed (Tomlinson & Moon, 2013).

Assessment and cognitivism learning theory. Assessment is an integral part of any instructional model. Formative assessment and feedback have been shown to help students perform at higher levels and increase their SRL skills (Clark, 2012; Nicol & Macfarlane-Dick, 2006). The cognitivism learning theory emphasizes the role of learner practice with corrective feedback from the instructor, which points to quality assessment as a necessary tool in cognitivism learning environments (Ertmer & Newby, 1993). Cognitivism posits that instructors should design assessment and feedback in such a way that learners can effectively assimilate new knowledge within the learners' existing cognitive structure (Ertmer & Newby, 1993). This points to assessment as a critical tool for learners and a need for quality, individualized feedback (Nicol & Macfarlane-Dick, 2006).

Assessment, academic performance, and differentiation. Academic performance is a term that can be understood in many different ways, and undoubtedly shifts based on the learning environment. Tomlinson and Moon (2013) refer to academic performance as the best information instructors have about students' knowledge, understandings, and abilities. Barnes (2015) similarly refers to academic performance as a story of a student's ability, skills, knowledge base, and growth. A term often used synonymously with academic performance is achievement. However, achievement typically is used when discussing students' overall abilities and skills, or their academic performance over time (Marzano, 2007). Whether looking at longer-term student achievement or shorter-term academic performance, these variables are overwhelmingly

measured using quantitative methods such as course grades and testing data (Bahceci & Gurol, 2016; Broadbent et al., 2021; Ghanizadeh, 2017; Melton et al., 2009; Pintrich & DeGroot, 1990; Saunders, 2014; Sockalingam, 2013; White & Fantone, 2010; Winter, 2018).

Differentiation refers to adjusting instruction in order for all students to receive appropriate materials and support in order to succeed academically (Ismaji & Imami-Morina, 2018; Tomlinson et al., 2003; Valiandes & Neophytou, 2018). This includes adjusting course materials, delivery methods, and pace to better match the skills of learners (Ismaji & Imami-Morina, 2018). Additionally, instructors may choose to differentiate instruction based upon different information, including students' learning styles, students' prior knowledge, students' personal preferences, or students' academic performance (Malacapay, 2019). Regardless of how instruction is differentiated for students, a necessary component is assessment to determine how to differentiate that instruction.

Assessment and differentiation are intertwined, in that differentiation cannot exist without assessment, and the natural progression from assessment is differentiation. Assessment allows for differentiation as it makes apparent which kinds of supports certain students need (Connor, 2019; Haelermans, Ghysels, & Prince, 2015). Additionally, assessment can allow for teachers to assign performance levels in order to differentiate future instruction (Stover, Yearta, & Harris, 2016). Performance levels, when accurately understood and communicated to students, can be used advantageously by both teachers and students (Welsh, D'Agostino, & Kaniskan, 2013). In a blended learning environment, assessment combined with digital differentiation can allow for

students to interact with content at different levels (Haelermans et al., 2015). Effective assessment can also support purposeful grouping to provide students with appropriate activities (Engel et al., 2017).

Because the effects of differentiated instruction can be far-reaching, both quantitative and qualitative methods have been used to assess the efficacy of differentiating instruction. Differentiation has been studied using qualitative methods in order to examine students' satisfaction with the instruction they received (DeMink-Carthew & Olofson, 2020; Maeng, 2016; Swan et al., 2015). Differentiation has also been studied using quantitative measures of students' grades in order to assess its impact on students' academic performance (Haelermans et al., 2015). Other quantitative measures used to assess differentiation are teacher self-report scales (Dixon et al., 2014).

Mastery Learning

In the following section, the mastery learning model will be defined and explored. More specifically, it will be discussed in terms of its reliance upon reassessment and extension. Finally, the usage of reassessment and extension as part of the intervention used in this study will be defended.

Mastery learning focuses on mastery goals over performance goals (Zheng, Jiang, & Dou, 2020). This learning model is defined as "requir[ing] that each student achieve a pre-established standard of performance on a specified set of instructional objectives in a criterion-referenced manner—that is, without regard to how well others are doing" (Lalley & Gentile, 2009, p. 30). The underlying premise of mastery learning is that the majority of students can learn what they are taught if they are given the right conditions and the right amount of time (Carroll, 1963; Guskey, 1980). This contrasts with

traditional teaching methods, in which the learning material is provided in one way to all students, resulting in a large variation in student learning where the pattern of achievement is typically aligned with a normal curve distribution (Zhang, 2010). Based on work by Bloom (1968), mastery learning breaks larger topics into smaller units, and students move on to the next task when they have mastered each small unit. One of the landmark features of mastery learning is that it makes room for students to master content at time intervals that are more appropriate to each individual student (Adeniji, Ameen, Dambatta, & Orilonise, 2018; Anderson 1976; Bloom, 1971; Caroll, 1963; Ee et al., 2018; Slavin, 1987). Because of these features, mastery learning can offer solutions to instructors that have a large number of students with different learning abilities and learning paces by providing flexible techniques to better individualize instruction (Guskey, 1980; Palardy, 1987).

Mastery learning relies upon frequent assessment and feedback, which ensures that students are corrected as needed and achieve a specific level of content knowledge or a specific skill before moving on to the next portion of the instruction (Bloom, 1968). This aspect of mastery learning allows the instructor to assess where students may have weaknesses and provide remedial support as needed (Wambugu & Changeiywo, 2008). In providing this feedback and support, instructors using the mastery learning approach create a space in which students continue trying to meet objectives until they are successful (Adeniji et al., 2018; Lalley & Gentile, 2009). In successful mastery learning environments, students are required to "learn and relearn until they demonstrate their competence" (Lalley & Gentile, 2009, p. 30). For learners that demonstrate competence right away or early in the process, instructors "provide enrichment objectives for students

to go beyond initial mastery to expand, organize, apply, and teach their newly acquired knowledge and skills" (Lalley & Gentile, 2009, p. 30).

The mastery learning approach is divided into two major schools of thought, which are the personalized system of instruction and the learning for mastery (LFM) teaching strategies. The personalized system of instruction strategy is defined as being "a self-paced learning activity in which the students have greater control over their learning" (Ee et al., 2018, p. 218). This strategy allows students the freedom to move at their own pace and progress at different times from one another. In contrast, the LFM strategy uses a teacher-controlled time sequencing, in which students are required to move through material at a pace decided by the instructor (Ee et al., 2018; Lai & Biggs, 1994; Swanson & Denton, 1997).

Mastery learning and self-monitoring tracking system. The SMTS created by this researcher is underpinned by the major beliefs of the mastery learning approach. The practice of unlimited attempts to demonstrate mastery was used as students were provided with alternative learning activities and encouraged to reassess as needed, on both formative and summative assessments (Anderson 1976; Bloom, 1971; Caroll 1963, Ee et al., 2018; Morphew et al., 2020; Palardy, 1987; Slavin, 1987). Additionally, the practice of providing students with enrichment opportunities when they have mastered content right away was used as students extended on assignments. This practice is most closely aligned with the LFM strategy within the mastery learning approach, in that students had certain time constraints within which to work, but both remedial support and enrichment were provided as needed.

Elements of mastery learning were included in this intervention because this learning model has been linked with better student retention and academic performance (Adeniji et al., 2018; Ee et al., 2018; Jones, Gordon, & Schechtman, 1975; Kibler, Cegala, Watson, Barkel, & David, 1981; Morphew et al., 2020; Wachanga & Gamba, 2004). Additionally, mastery learning has been shown to yield greater student interest and positive attitudes than traditional teacher-centered models (Ee et al., 2018). Students in mastery learning environments tend to have more motivation than students in traditional learning environments (Changeiywo et al., 2011). Additionally, the reassessment and extension components of SMTS correlate with a major tenet of mastery learning, that students have unlimited opportunities to demonstrate mastery (Adeniji et al., 2018; Anderson 1976; Bloom, 1971; Caroll 1963, Ee et al., 2018; Gentile, 2004; Slavin, 1987). This aspect of mastery learning was reflected in my intervention, as students were encouraged to reassess on assignments until they reached a satisfactory score of 3. When students do not master the content the first time, they would benefit from "reteaching, more examples, peer tutoring by those who did pass...when they have shown sufficient progress in these exercises, they are then eligible to retake a parallel form of the test" (Lalley & Gentile. 2009, p. 33). Additionally, part of the mastery learning model is set up to "provide enrichment objectives for students to go beyond initial mastery to expand, organize, apply, and teach their newly acquired knowledge and skills" (Lalley & Gentile, 2009, p. 30). This aspect of mastery learning aligned perfectly with the extension practice that was a part of the SMTS intervention used in this study. This enrichment occurred when students who need additional support were getting this support before reassessing. Additionally, "initial mastery must be considered the beginning, and thus earn only the

lowest passing grade for that unit. Higher grades are reserved for going beyond mastery to demonstrating fluency, ability to apply the material, analytical or creative skills, and the ability to teach the material to others" (Lalley & Gentile, 2009, p. 33). This conception of mastery learning adheres to the grading system in which my study existed, where students earned a score of 3 for demonstrating proficiency but did not earn a score of 4 until they had demonstrated the ability to extend beyond proficiency.

Quantitative measurements, including grade and testing data, as well as attrition rates, are commonly used to assess the effectiveness of the mastery learning approach (Adeniji et al., 2018; Guskey & Monsaas, 1979; Jones et al., 1975; Morphew et al., 2020) Qualitative case studies have also been used to evaluate the effectiveness of implementing a mastery learning approach (Jones, 2016). Mastery learning has been extensively researched at the K-12 school level (Adeniji et al., 2018; Jones, 2016; Sanderson, 1976; Wambugu & Changeiywo, 2008; Wachanga & Gamba, 2004). This supports the use of elements of the mastery learning approach within my middle school classroom. Additionally, mastery learning has been heavily researched in subjects such as math and science (Adeniji et al., 2018; Wambugu & Changeiywo, 2008; Wambugu & Gamba, 2004). Mastery learning in the humanities, especially in ELA, has not been heavily implemented or researched.

Tracking and Self-Monitoring

In this section, tracking and self-monitoring will be defined. Tracking and self-monitoring will be discussed in terms of use for behavior changes, use for academic improvement, and use for SRL improvement. Research methods for measuring the impact of tracking and self-monitoring will be discussed at the end of this section.

Use for behavior changes. Tracking and self-monitoring are similar concepts but have slightly different undertones in the literature. Self-monitoring is commonly referred to as a subset of self-management and typically is used when considering behavior management (Rafferty, 2010; Shimabukuro & Prater, 1999; Wood, Murdoch, & Cronin, 2002). Several studies have shown that using a self-monitoring mechanism with students enables them to change their behaviors over time (Martin et al., 2003; Rafferty, 2010; Shimabukuro & Prater, 1999; Wood et al., 2002). Self-monitoring and progress tracking have also been shown to be successful in helping people change their behaviors in health settings (Yang, 2021).

Use for academic improvement. Tracking is typically understood as the concrete process of recording behaviors or performance. The activity of tracking is related to self-evaluation, which Kitsantas and Zimmerman (1998) discuss as a process by which students compare their performance against a certain norm and then adjust their learning activities based on this comparison. Tracking is also similar to what Zimmerman (2002) calls monitoring, in which students keep track of their performance and pay attention to signs of progress.

For the purposes of this study, Marzano's (2007) definition of tracking was used, which refers to the process of students charting their own progress on assessments over time. This tracking process provided students with a visual representation of their progress in the class.

Use for self-regulated learning improvement. The SMTS used in this intervention has been developed by the researcher. Students were both self-monitoring their learning behaviors as well as tracking their scores and reassessment attempts. The

SMTS was purposefully created for this intervention because tracking and self-monitoring have been shown to be effective in spurring positive behavioral changes in students (Rafferty, 2010; Wood et al., 2002). Tracking and self-monitoring can improve students' SRL skills and academic performance (Martinez, Mon, Alvarez, Fueyo, & Dobarro, 2020; Rafferty, 2010; Shimabukuro & Prater, 1999; Wood et al., 2002). The use of self-determination as a method of tracking can assist students in becoming more self-directed when completing independent work (Martin et al., 2003). An essential piece of the SMTS was the feedback that students will receive on their learning and the process of tracking both their performance and the feedback received. Classrooms that utilize performance feedback with references to exemplary peer output tend to result in students that have greater task mastery orientation and perceived autonomy (Raska, 2014). Standards-based grading can help teachers communicate to students their mastery of topics and skills better than traditional grading using an accumulation of total points (Scarlett, 2018). However, one study found that while tracking and self-monitoring can help students make positive behavior changes, students do not always translate this to settings where the tracking system is not present (Wood et al., 2002). Because of this, students were engaged in other activities that promote SRL in order to solidify those skills.

Tracking and self-monitoring measures. In past studies, quantitative methods have been primarily used to assess the efficacy of tracking and self-monitoring. Data such as scores of academic accuracy, academic productivity, grades, and on-task behavior are commonly collected (Shimabukuro et al., 1999; Wood et al., 2002). Additionally, quantitative methods can be used to assess the impact of self-monitoring by collecting

data regarding the frequency of homework completion (Trammel, Schloss, & Alper, 1994). Used less frequently, qualitative methods such as open-ended interviews can be used to assess students' self-monitoring skills (Lan, 2005).

Chapter Summary

In this chapter, the theoretical background of this study was detailed, including (1) cognitivism, and (2) self-regulated learning. Additionally, the learning designs and instructional strategies informing the intervention used in this study were reviewed. These elements include (1) blended and flipped learning, (2) assessment, (3) mastery learning, and (4) tracking and self-monitoring.

The intervention being used in this study measured both students' behaviors and students' cognitive processes. Because of this, the cognitivism learning theory was most appropriate, as it considers both observable behaviors and mental processes. Additionally, the intervention being used in this study had the goal of improving students' SRL skills, which aligns with the cognitivism perspective that mental processes can be taught, and that doing so can improve educational outcomes (Anderson et al., 1997). Additionally, cognitivism emphasizes metacognition (Zimmerman, 2002). This study measured students' metacognitive processes through the MSLQ.

A review of the literature shows that learning environments and their impact on student academic performance have been studied using quantitative, qualitative, and mixed methods. However, many of these studies focus on higher education or high school populations. Using a mixed methods study design allowed for an evaluation of the blended learning model in a middle school environment that includes explanatory qualitative data to better explain the results of the study with a population that has not

been as extensively studied. This study also sought to evaluate how learning environments are related to students' SRL skills. Many studies assess this relationship using quantitative SRL surveys. This study will evaluate students' SRL skills using the quantitative MSLQ survey.

A core aspect of the intervention being used in this study was the SMTS. The purpose for using the SMTS was to help students set goals for their learning after taking assessments. Cognitivism emphasizes the mental processes that students use to learn and retain information (Ertmer & Newby, 1993; Kitsantas et al., 2004, Zimmerman, 2002). One of these processes is goal setting, which students did each time they completed an entry in the SMTS. The SMTS required students to track both their behaviors and academic performance on assessments which can also bolster their SRL skills. Past studies have measured the impacts of tracking and self-monitoring using primarily quantitative methods, although a smaller number of studies have utilized qualitative methods. Because the SMTS was a tool that has been created specifically for this intervention and has not been externally validated or evaluated by other researchers, both quantitative data in terms of students' scores on assessments, frequency of reassessment and extension, results of the MSLQ, and student engagement surveys, and qualitative data in terms of student interviews were used to gather as much data about the effectiveness of the SMTS as possible.

Additionally, many studies measure academic performance using quantitative methods, which is why this study measure students' academic performance by tracking the numerical scores that students earn on formative and summative assessments. Differentiation practices have been assessed using both quantitative measures in terms of

students' resulting scores, and qualitative measures in terms of interviews with students and instructors. This study measured the effectiveness of the differentiated instruction offered using mixed methods, in which both students' scores and their opinions of the instruction were collected and analyzed.

A large backbone of the intervention being used in this study, mastery learning, is often assessed in the literature using quantitative methods. However, mastery learning has not been extensively studied in English language arts or social studies classrooms. Because of this, mixed methods was used in order to more comprehensively explain the results of the study.

CHAPTER 3

METHODS

The purpose of this action research was to evaluate the effects of the implementation of weekly blended learning interventions combined with a self-monitoring achievement system on students' self-regulated learning skills and academic performance in an eighth-grade English language arts classroom at Branch Middle School.

The following research questions were addressed in this study:

1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?

Research Design

Action research was used for this study and was an appropriate methodology because of its informative results and its ability to provide direct classroom applications (Mertler, 2020). While traditional research methods typically seek to find answers to

larger questions and produce generalizable results, action research is intended for practical application and seeks to directly solve problems of practice (Mertler, 2020). Action research is also defined as a process by which researchers work in conjunction with stakeholders in order to orchestrate action and generate knowledge that will benefit the community in which the research is undertaken (Greenwood & Levin, 2007). Because of its contextualized design, action research democratizes the research practice and allows for practitioners to apply quality research to their specific locations and contexts (Greenwood & Levin, 2007).

This study was conducted in my own classroom. Because of this, action research was appropriate because of my vested interest in the study and my interest in learning more about teaching practice and student learning (Mertler, 2020). My personal interest in this study was another reason that action research is the most appropriate methodology, in that traditional experimental research necessitates having a control group and an experimental group (Mertler, 2020). In the context of classroom research, this creates ethical problems because students within a classroom should be given the same opportunities. Additionally, because the research site in which this study was conducted has a unique student population and pedagogy, action research was a tool by which to understand this particular setting and make direct improvements to it (Mertler, 2020).

For this action research study, I implemented an intervention within my eighth-grade English classes in order to evaluate the effectiveness of the intervention in prompting development of students' self-regulated learning and academic performance. This action research study used a convergent parallel mixed methods approach to investigate this intervention. This type of research design was chosen because of the

exploratory nature of this study. While quantitative methods were heavily relied upon to test the effectiveness of the intervention, it was also important to record student feedback, and other types of qualitative information in order to understand the impact of the intervention more fully.

Using a convergent research design allowed for the strengths of both quantitative and qualitative methods to assist in answering the research questions of this study (Morgan, 2014). In order to draw from the strengths of quantitative and qualitative research methods, a fixed mixed methods design was used, in which all data collection and analysis methods were planned before beginning the study (Creswell & Plano Clark, 2018). Using this research design allowed for complementary data to be collected and used in combination to answer the research questions (Creswell & Plano Clark, 2018). Additionally, using a mixed methods design can help to mitigate bias, which is an important consideration when undertaking action research in one's own classroom (Creswell and Creswell, 2018). The convergent parallel mixed methods approach enabled me to collect data at several points in the research process in order to more completely analyze the effects of the intervention and its impact on students (Creswell and Creswell, 2018; Creswell & Plano Clark, 2018).

Setting and Participants

This action research study took place in my eighth-grade English language arts classroom at Branch Middle School in southeast Minnesota. I taught three sections of eighth-grade English language arts, with each class having a class size of about 30 students. These classes were not separated by student ability, and each class contained students ranging from low academic ability level to high academic ability level, including

students designated as “gifted and talented” as well as students that are served by special education services. Because of this, the students in my classes reflect the school demographics, which were described in the first chapter. These three course sections comprised roughly half of the eighth-grade class.

Each section that I taught was a daily 86-minute block. I saw these students every day for the entire school year. All students had a school-issued iPad that they used in this class. Class resources and assignments were posted to Google Classroom, and grades were input into Infinite Campus, which is the learning management system used by the district. Additionally, my classroom was equipped with an Apple TV that was used for projecting notes and other materials. Students also made use of the Apple TV to project materials and give presentations themselves. For the most part, each class period was sectioned into different activities. For the first 10-15 minutes of class, students read from their independently selected books. After reading time, students spent about 10 minutes journal writing in their writer’s notebooks. Students then received a mini lesson on the topic for that day, usually lasting about 20 minutes. After this, students typically spent the remainder of class time working on a related activity or practicing new skills and content. Usually about once a week, students completed a formative assessment to check for understanding of content and mastery of skills. If students did not score well on these assessments, they were expected to review the content and reassess. In this classroom model, students did not have experience with the SMTS, but they did have some experience with blended learning, in that some activities are delivered via students’ iPads to be completed independently by students at their own pace.

When the intervention was delivered to students during the study, my classroom model was adjusted on the days that students were engaged in blended learning intervention time. Additionally, students engaged with the SMTS after taking assessments, reassessing, or extending. Other than these modifications, my daily classroom environment and procedures remained the same. Students were engaged in blended learning intervention time about once per week and completed entries or updates in their SMTS about twice a week. On the other days, the classroom model remained the same as before the intervention. On blended learning intervention days, students continued to have independent reading time for the first 10-15 minutes of class. They also had time to respond to a writing prompt in their writer's notebooks. However, before the lesson for the day, students completed an entry in the SMTS to reflect their most recent assignment grade. After completing this entry, the mini-lesson and/or the activity for that day was delivered to students in a blended learning format. After students completed the blended learning activity, they submitted their work for me to review. I reviewed and graded all student work, and they then updated their SMTS as needed the following day in class. A daily outline of activities can be seen in Appendix A.

During the period that the intervention was delivered to students, they were in a book club unit focused on social activism. Before beginning the unit, students browsed several different young adult novels that featured social activism or focused on a social issue in some way. After browsing, students created a ranked preference list of the books they most wanted to read. Based on this list, students were put into book club groups of about two to six students. During the unit, students read their book club book with the other members of their book club. While this was happening, I also delivered whole-class

instruction and lead different learning activities with the students. In addition to reading their book club book, students worked with vocabulary that was tied into the idea of social activism, read informational articles about real instances of social activism, and read short pieces of literature (short stories, poems, songs) that were connected to the idea of social activism. In addition, students practiced their presentation and discussion skills by holding book club discussions as well as participating in whole class discussions throughout the unit.

Every student in my classes received the intervention treatment, although data was only collected from the students who assented and their parent and/or guardian had provided consent for their participation before the study began (n = 45). When focus group interviews were conducted, a purposeful sample was used to select 18 interview participants. More detailed sampling procedures for focus groups are discussed later in this chapter. Using a purposeful selection for qualitative data collection allows the researcher to better understand the research questions (Creswell & Creswell, 2018).

This research site was unique because Branch Public Schools uses a standards-referenced grading system. The district promotes the use of this system as a method by which teachers can effectively differentiate instruction. This particular grading system does not use standard letter grades but rather numerical scores ranging from 1-4, where 1 refers to “Completes learning target below grade level”, 2 refers to “Completes learning target slightly below grade level”, 3 refers to “Completes learning target at grade level”, and 4 refers to “Completes learning target above grade level”. These score descriptions can also be seen in Table 3.9. In this district, students are scored on their performance on individual standards, which is intended to allow teachers to provide specific interventions

when students are struggling in a certain area or have shown the need for more advanced material. These standards are referred to by the district as Essential Learning Objectives (ELOs). Students' scores in the gradebook are directly tied to specific ELOs. This grading system is also intended to allow for high-achieving students to move beyond grade-level content if they are progressing at a pace that is faster than their peers.

Being a new teacher to the district for the 2019-2020 school year, I tried to adopt this grading system and emphasis on reassessment and extension with fidelity. However, I found that this system was difficult to use effectively using traditional teaching methods. In my own class during the 2019-2020 academic year, only about 4% of students regularly attempted a level 4 score, despite the fact that a much higher percentage of my students were capable of this higher level of work. Additionally, students who earned a 1 or 2 on assignments very rarely reviewed the content and attempted to reassess. This action research was used to clarify the problem and test a potential solution for my own classroom.

Intervention

The intervention being used in this study was applied for six weeks. A detailed outline of intervention content and activities can be seen in Appendix A. The learning system and philosophy at my school require students to have developed self-regulated learning skills. Because of this, the intervention that was created and used in this study contained blended units of instruction during a set intervention time combined with the SMTS in order to boost students' self-regulated learning skills and increase the likelihood of students performing at a higher academic level. The specific SRL skills that were addressed align with the SRL components put forward by Pintrich (2000): (1)

forethought, planning, and activation; (2) monitoring; (3) control; and (4) reaction and reflection. The intervention used in this study consists of two major components: blended learning intervention time and the SMTS. In the following sections, each component of the intervention will be outlined, and its use will be explained in detail.

Blended Learning Intervention Time

Students engaged with blended learning intervention time about once per week during the six-week intervention period. This intervention time and the blended learning content was structured based on students' graded classroom assignments. Prior to delivering the blended learning intervention to students, I reviewed students' most recent classroom assignment. Based on trends in students' performance, I created a blended learning intervention module that was designed to help students review content and reassess or provide students with enrichment opportunities so that they could extend. The blended learning modules were created using a Google Slides presentation that facilitated different student activities based on needs for re-teaching, extra support in certain areas, or need for extension and enrichment. For example, if students completed a formative assignment on vocabulary for the week, the blended learning would be designed to either give students extra support that did not reach proficiency on the assignment, or give enrichment opportunities to students that reached a level of proficiency on the original assignment. Each of these Google Slides presentations were shared with students via Google Classroom. Students accessed these presentations on their school-issued iPads.

On the first slide of the blended learning module, directions for engaging with the blended learning intervention were provided. Students had two main options: Option 1: Reassessment; and Option 2: Extension. If students did not meet grade-level expectations

on their graded assignment, they would complete the blended learning activity for "Reassessment," which provided them with extra materials or extra support in order to revise and resubmit their work for a higher score. If students previously met grade-level expectations on their graded assignment, they would complete the blended learning activity for "Extension," which gave them the opportunity to extend to an "above grade level" score.

Materials and resources that students viewed while participating in the blended learning intervention included: instructional videos recorded by myself; instructional videos from external sources; digital notes on applicable skills and content; informational articles, poems, and short stories. I hyperlinked materials and resources that students used in the appropriate Google Slides presentation slide.

For both the "Reassessment" and "Extension" options, students worked independently with the blended learning content but were encouraged to seek help from me as needed. Blended learning content was delivered during class time and students were only expected to work on it outside of class if they did not complete it during the time given.

Justification for Blended Learning

I chose to provide blended learning intervention time to my students because of the links that previous studies have found between blended learning and academic performance, blended learning and student satisfaction, and blended learning and students' SRL skills. Additionally, blended learning allows for a more streamlined differentiation of instruction, which is important to consider when aligning instruction to

the reassessment and extension model used at the research site. A table representation of previous scholarship on the benefits of blended learning is provided in Table 3.1.

Table 3.1 *Justification for Blended Learning*

Benefit of blended learning	Scholarly resources
Increased academic performance	Alexandre & Enslin, 2017 Banerjee, 2011 Prescott et al., 2018 Truitt & Ku, 2018
Increased student satisfaction	Banerjee, 2011 Melton et al., 2009 Truitt & Ku, 2018
Increased SRL skills	Bahri et al., 2021 Uz & Uzun, 2018 Van Laer & Elen, 2017
Facilitation of differentiation	Altemueller & Lindquist, 2017 Brodersen & Melluzzo, 2017 Fazal et al., 2020 Fisher et al., 2021 Matamoros, 2016 Winter, 2018 Yarbro, Arfstrom, & McKnight, 2014

One intention of my intervention was to bolster students' academic performance in my class. Many studies have found that the blended learning model is effective in increasing students' performance in coursework (Alexandre & Enslin, 2017; Banerjee, 2011; Prescott et al., 2018; Truitt & Ku, 2018). Additionally, a blended learning format may help students with metacognitive and resource management strategies, which are two key components of self-regulated learning skills (Broadbent, 2017). When selecting a learning model, student satisfaction is also important to take into account. While I was not measuring student satisfaction directly, I was investigating how the intervention affected students' perceptions of learning English language arts content, and blended

learning has been shown to increase student satisfaction (Banerjee, 2011; Melton et al., 2009; Truitt & Ku, 2018). Another intention of my intervention was to help students improve their SRL. Blended learning has been shown to be more effective than traditional learning in establishing students' SRL (Bahri et al., 2021; Uz & Uzun, 2018; Van Laer & Elen, 2017). Table 3.2 outlines the links between the blended learning intervention time and the SRL components outlined by Pintrich (2000).

Table 3.2 *Blended Learning & SRL Skills Addressed*

Pintrich (2000) SRL component	Areas for regulation	Blended learning component
Forethought, planning, and activation	• Behavior: time and effort planning • Cognition: target goal setting	Students will choose the activity within the blended learning that is most appropriate to their learning needs. For the selected task, students will begin with a specific goal of either raising their current performance to grade-level competence or extending their current performance to above grade-level competence.
Monitoring	• Behavior: awareness and monitoring of effort, time use, need for help	Once the task has been selected, students will set their own pace to complete the blended learning within the class time given.
Control	• Cognition: selection and adaptation of cognitive strategies for learning, thinking	While students are working in the blended learning module, they will be prompted to use learning and thinking strategies that they think will work best for them (reviewing notes, looking up definitions, making personal connections, etc.).
Reaction and reflection	• Cognition: cognitive judgments	When students are at the end of the blended learning module, they will be asked to evaluate the progress they made cognitively.

Blended learning has also been recommended when trying to deliver differentiated instruction (Brodersen & Melluzzo, 2017; Fazal et al., 2020; Matamoros, 2016; Winter, 2018). By moving a portion of course materials and activities online, class time can be used to provide students with more individualized support (Altemueller & Lindquist, 2017; Fisher et al., 2021; Matamoros, 2016; Winter, 2018; Yarbro, Arfstrom, & McKnight, 2014). As students were working with differentiated content and assignments during the intervention, blended learning seemed to be an appropriate choice as it facilitates this type of differentiated environment.

Self-Monitoring Tracking System (SMTS)

The SMTS was a Google Sheets document that I created for students and distributed via Google Classroom. Via the functionality of Google Classroom, a copy was automatically made for each student so that they had their own editable version of the document. The SMTS had the following column titles: (1) Date; (2) Assignment Name; (3) ELO; (4) Score; (5) Do you need to reassess?; (6) New Score (as needed); (7) ELO Confidence; (8) Why do you think you earned this score?; and (9) Next Steps (see Table 3.3 and Figure 3.1). Some of the columns were set up to have a drop-down menu of choices for students, and some were free response. A selection of choices automatically color-coded the document for students. Color coding was chosen in order to give students a visual representation of their progress and to help students establish a more tangible and emotional reaction to their performance in class, as color-coding can elicit emotional responses and help cue future decision making (Trudel, Murray, Kim, & Chen, 2015; Weller & Livingston, 1988). Table 3.3 outlines the column titles and possible responses, along with the colors assigned to certain responses.

Table 3.3 *Self-Monitoring Tracking System Components*

Column title	Response options	Color code
Date	Free response	None
Assignment Name	Free response dictated by teacher	None
Essential Learning Objective (ELO)	Dropdown: • Clear & Coherent Writing • Language • Reading Literature • Reading Informational Text • Presentation of Knowledge	Clear & Coherent Writing: Purple Language: Blue Reading Literature: Orange Reading Informational Text: Green Presentation of Knowledge: Pink
Score	Dropdown: • 1 • 2 • 3 • 4	1: Red 2: Yellow 3: Green 4: Blue
Do you need to reassess?	Dropdown: • Yes • No	
New Score (as needed)	Dropdown: • 1 • 2 • 3 • 4	1: Red 2: Yellow 3: Green 4: Blue
ELO Confidence	Dropdown: • I feel very confident with the ELO • I feel confident with the ELO • I feel somewhat confident with the ELO • I do not feel confident with the ELO	None
Why do you think you earned this score?	Free response	None
Next Steps	Free response	None

A	B	C	D	E	F	G	H	I
DATE	ASSIGNMENT NAME	ELO	SCORE	Do you need to reassess?	NEW SCORE (as needed)	ELO CONFIDENCE	Why do you think you earned this score?	NEXT STEPS
10/28/21	Characterization Formative	Reading Literature	2	Yes	3	I feel somewhat confident with the El	I took the quiz really fast and could have slowed down	Review notes and retake quiz
11/5/21	Characterization TIQA	Clear and Coheren	1	Yes	2	I feel somewhat confident with the El	I wrote my paragraph but didn't make sure it was in the right format	Review TIQA format and restructure paragraph
11/20	Book Club TIQA	Clear and Coheren	2	Yes	3	I feel confident with the ELO	I did not analyze the quote enough	Add at least one more analysis sentence to paragraph
11/20	Book Club TIQA	Reading Literature	3	No		I feel confident with the ELO	I liked my book a lot and had a lot to say in my paragraph	None. Extend if possible.
11/29/21	Book Club Presentation	Presentation of Kn	3	No		I feel confident with the ELO	I practiced my presentation with a friend.	None. Extend if possible.
11/29/21	Book Club Presentation	Reading Literature	3	No		I feel confident with the ELO	I liked my book a lot and had a lot to	None. Extend if possible.
12/21/21	Renewable Energy Presentation	Presentation of Kn	1	Yes	3	I feel somewhat confident with the El	I knew what I needed to do but only did part of the assignment.	Complete the rest of assignment
12/22/21	Renewable Energy Infographic	Clear and Coheren	3	No		I feel confident with the ELO	I had good research notes before creating my infographic so it was pretty easy to transfer information over	None. Extend if possible.
12/22/21	Renewable Energy Infographic	Language	2	Yes	3	I feel confident with the ELO	I was rushed and did not proofread	Proofread & revise

Figure 3.1 Example Self-Monitoring Tracking System

Each time students completed a graded assignment, they completed an entry in the SMTS. Google Classroom automatically saved each entry in the SMTS, and students had a compiled list of entries by the end of the intervention.

Justification for SMTS

A large component of SRL is monitoring progress and adjusting cognition and behavior accordingly. The SMTS was intended to help students monitor their own progress in class and think more deeply about their work and study habits than they otherwise would. Table 3.4 outlines the links between the SMTS and the SRL components put forth by Pintrich (2000).

Table 3.4 *SMTS & SRL Skills Addressed*

Pintrich (2000) SRL component	Areas for regulation	SMTS component
Forethought, planning, and activation	• Cognition: target goal setting • Cognition: metacognitive knowledge activation • Motivation/affect: efficacy judgments	Students completed an open-ended response outlining their "Next Steps" for learning, involving setting goals and activating knowledge of metacognitive processes. Students rated their "Confidence with ELO" and made efficacy judgments about their ability.
Monitoring	• Behavior: awareness and monitoring of effort, time use, need for help	Students responded to the question: "Why do you think you earned this score?" This helped students reflect on the effort they spent on the assignment and decide how to allocate effort on the blended learning task.
Control	• Control: selection and adaptation of cognitive strategies for learning, thinking	When students filled out the "Next steps" portion of the SMTS, they were prompted to decide what kinds of learning and thinking strategies they would use during the blended learning activities.
Reaction and reflection	• Control: cognitive judgments	Students input their "ELO confidence" prompting them to make judgments about their current cognitive abilities.

Past research has found that tracking and self-monitoring can positively affect students' SRL and academic performance (Martinez et al., 2020; Rafferty, 2010; Shimabukuro & Prater, 1999; Wood et al., 2002). Several studies have also shown that incorporating a self-monitoring mechanism into the class structure can help students make positive behavior changes over time (Martin et al., 2003; Rafferty, 2010; Shimabukuro & Prater, 1999; Wood et al., 2002). Table 3.5 represents the previous scholarship on the benefits of tracking and self-monitoring.

Table 3.5 *Benefits of Tracking and Self-Monitoring*

Benefit of tracking and/or self-monitoring	Scholarly resources
Positive effect on SRL	Martinez et al., 2020 Rafferty, 2010 Shimabukuro & Prater, 1999 Wood et al., 2002
Positive effect on academic performance	Martinez et al., 2020 Rafferty, 2010 Shimabukuro & Prater, 1999 Wood et al., 2002
Positive behavior change	Martin et al., 2003 Rafferty, 2010 Shimabukuro & Prater, 1999 Wood et al., 2002

Blended Learning Combined with Self-Monitoring Tracking System

In my intervention, the blended learning intervention time was designed to work with the SMTS that students filled out during the intervention. During each week of the intervention, students completed one graded assignment, completed one SMTS entry based on this assignment, participated in a blended learning intervention once, and updated their SMTS as applicable. When students were finished with their blended

learning work, they submitted their work to Google Classroom, and if they earned a new score, this new score was recorded in my grade book and students updated their SMTS.

The reason that both of these components are necessary is twofold. The first is that SRL skills are best learned when intentionally taught and practiced (Dignath & Büttner, 2018; Levy, 1996; Paris & Paris, 2001; Schunk & Ertmer, 2005). Blended learning has been shown to increase student satisfaction (Banerjee, 2011; Melton et al., 2009; Truitt & Ku, 2018). However, other research has shown that some online learning models can be difficult for students with less developed SRL to navigate and succeed within (Marino, 2000). Because of this, the SMTS was being used in conjunction with blended learning intervention time in order to scaffold students more effectively and create a learning environment in which all students had support in using the blended learning. Using blended learning intervention time alone would benefit students but would not intentionally teach students SRL skills. Past scholarship has indicated that explicitly teaching SRL skills should include the following: (a) introducing the SRL strategy by defining it and modeling it; (b) explaining why the strategy works; (c) explaining how the strategy can be useful in other contexts; and (d) providing opportunities for students to perfect the strategy via practice (Kiewra, 2002; Pressley and Woloshyn, 1995). This is why the SMTS was incorporated into the intervention, as it is a means by which to teach students SRL skills and have them practice these skills in a concrete way.

The second reason these two components were combined is that the use of the SMTS alone does not provide students with the time and space in class to review material, revise their work, and extend on their learning. Using assessment and online

learning environments have been shown to make it easier for students to revise assignments, interact with others, and track their progress (Demir, 2021). Additionally, using blended learning can help facilitate differentiated instruction environments in which students can access the specific content they need (Brodersen & Melluzzo, 2017). Blended learning can help teachers personalize learning for students and connect them with the specific materials that they need (Matamoros, 2016; Winter, 2018). In such environments, students have the tools and content at their disposal to act on the goals they have set for themselves with their use of the SMTS. In my own personal experience, when I have asked students to track their progress but have not given them structured guidance on what to do with the information they are tracking, they do not follow through. Therefore, little benefit is reaped. Pairing the blended learning intervention time with the SMTS provided students with direction but also with the time and resources to put this direction into action.

Data Collection

This study utilized five data sources: (1) Motivated Strategies for Learning Questionnaire (MSLQ); (2) teacher scoresheet; (3) Student Engagement & Experience Inventory (SEEI); (4) focus group interviews; and (5) SMTS open-ended responses. The following sections provide detail for each of these data sources. Table 3.6 illustrates alignment between my research questions and the data sources being used in this study. For all data collection methods, student information will be recorded securely with a randomly assigned student ID number rather than under the students' name. This will ensure that students' information is protected and that participants in this study remain anonymous (Mertler, 2020).

Table 3.6 *Research Question and Data Source Alignment*

Research questions	Data sources
1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?	• Focus Group Interviews • Motivated Strategies for Learning Questionnaire • SMTS open-ended responses
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?	• Teacher scoresheet • Focus Group Interviews • SMTS open-ended responses
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?	• Student Engagement & Experience Inventory • Focus Group Interviews

Quantitative Data Sources

In the following section, quantitative data sources will be described in detail.

Motivated Strategies for Learning Questionnaire (MSLQ). The MSLQ was published in 1991 by a team of researchers from the National Center for Research to Improve Postsecondary Teaching and Learning. It was designed to assess college students' motivational orientations and their use of different self-regulated learning strategies while participating in a college course (Pintrich, Smith, Garcia, & McKeachie, 1991). The MSLQ is a self-report instrument that contains 81 items. There are 15 scales

within the MSLQ that are designed to be used together or singly. The MSLQ has been validated and its reliability has been tested. Confirmatory factor analyses were performed and indicate that the MSLQ shows reasonable factor validity (Pintrich et al., 1991).

For this study, an adapted version of the MSLQ was used as a pre- and post-test measure of students' SRL skills (see Appendix B). Using the MSLQ in this way allowed for any changes in students' SRL from before receiving the intervention to after receiving the intervention to be calculated. The original 15 scales were reduced to five in research by Pintrich and DeGroot (1990). In their study, factor analysis was used to guide scale construction, and some items were excluded due to a lack of correlation or lack of a stable factor structure (Pintrich & DeGroot, 1990). These five scales include: (1) Self-Efficacy, (2) Intrinsic Value, (3) Test Anxiety, (4) Cognitive Strategy Use, and (5) Self-Regulation. Definitions of each subscale can be seen in Table 3.7. All five of these scales will be used in data collection and analysis for this study.

Table 3.7 *MSLQ Adapted Scale Descriptions*

Scale	Description
Self-Efficacy	Perceived competence and confidence in performance of classwork
Intrinsic Value	Intrinsic interest and perceived importance of coursework Preference for challenge and mastery goals
Test Anxiety	Worry about cognitive interference on tests
Cognitive Strategy Use	Use of rehearsal strategies, elaboration strategies, and organizational strategies
Self-Regulation	Metacognitive strategies such as planning, skimming, and comprehension monitoring Effort management strategies such as persistence at difficult or boring tasks and working diligently

The total number of items in this adapted version of the MSLQ is 56, with 44 of the items being used to form the five scales. For this study, the 44 items used to form the five scales were used in their original wording. For each of these items, students were asked to respond to a 7-point Likert scale, with 1 signifying "not at all true of me" and 7 signifying "very true of me". Cronbach's alpha values for these scales range from 0.74 to 0.89 (Pintrich & DeGroot, 1990). These values show a high level of internal consistency within the sections of the survey (Creswell & Creswell, 2018). Cronbach's alpha is the most widely used objective measure of reliability (Tavakol & Dennick, 2011). Cronbach's alpha values range from 0 to 1 and indicate the internal consistency of a specific test or scale (Tavakol & Dennick, 2011).

Because the participants of this study were eighth-grade students, this reduced number of items is preferable and may have reduced the likelihood that students provided random answers on the survey due to fatigue. Previous research indicates that fatigue in participants during a research study can contaminate data, and a large number of self-report test items can increase fatigue (Brehman, Burns, Thaler, Rojas, & Barchard, 2009). Additionally, the Pintrich and DeGroot (1990) study focused on seventh and eighth-grade students, which is a more similar population to this research.

Teacher scoresheet. The teacher scoresheet was a data collection tool provided by the school district and adapted by the researcher prior to this study for daily use in the classroom. This data source provided three different sources of data related to students' academic performance, including (1) students' grades on class assignments; (2) frequency of students reassessing or extending on assignments; and (3) the number of missing assignments students have. Separately, each of these data sources indicate how

students are performing academically. By using all three of these data sources, a more complete picture of students' academic performance in the class can be created.

The teacher scoresheet was a paper spreadsheet that listed student names in a given class in the first column of the spreadsheet, giving each student a dedicated row across the sheet in which scores could be recorded over time. Each subsequent column denoted a specific class assignment., so that there was a visual running record of students' scores on assignments. When assignment scores were recorded in the teacher scoresheet, I noted three pieces of information about the assignment in the column header: (1) whether the assignment is formative or summative; (2) which ELO the assignments correspond with; and (3) an abbreviated title for the assignment. If an assignment was summative, it was marked with an "S." An example of what this looked like can be seen in Figure 3.2. The ELO was recorded with an abbreviation. Table 3.8 outlines each ELO and the abbreviation with which it was notated.

Table 3.8 *ELO Abbreviations*

ELO	Abbreviation
Reading Literature	RL
Reading Informational Text	RI
Clear & Coherent Writing	W
Language	L
Presentation of Knowledge	P

Students' assignment grades were scored in alignment with ELOs. Students were able to earn scores ranging from 1 to 4. Table 3.9 describes the meaning of each score.

Each assignment that students complete in class was graded and recorded in order to measure students' academic performance. These assignments were a reflection of classroom artifacts, which are commonly used in action research (Mertler, 2020).

Table 3.9 *Students' Assignment Grade Score Values*

Score	Meaning
1	Completes learning target below grade level
2	Completes learning target slightly below grade level
3	Completes learning target at grade level
4	Completes learning target above grade level

Classroom artifacts can include work done by students that is a typical part of their schoolwork, but that the researcher has leveraged for research purposes (Mertler, 2020). Students' scores were recorded by lightly filling the corresponding box for that student and the assignment being recorded. The box was filled one-third of the way for a score of 1, two-thirds of the way for the score of 2, and all the way for the score of 3. When students reassessed and earned a higher score, the box was filled in accordingly with a different color to denote that reassessment has resulted in a new score. If students extended and earned a score of 4, the box was darkly and completely filled in to visually indicate the "Above grade level" score. For my own ease of use, each assignment was colored with a different color to help easily distinguish each column. The color itself has no meaning. An example of the teacher scoresheet can be seen in Figure 3.2.

Figure 3.2 Teacher Scoresheet

Student Engagement and Experience Inventory (SEEI).

One of the aims of this study was to determine in what ways use of the SMTS and blended learning intervention time affected students' experiences in class as a result

of receiving the intervention. The SEEI was a quantitative survey that collected information from students about their experiences and satisfaction using the SMTS and blended learning intervention time. The SEEI was comprised of two sections: (1) a section devoted to collecting information about students' engagement and experience during blended learning intervention time; and (2) a section devoted to collecting information about students' experience using the SMTS.

In the first section of the SEEI, students rated statements about their experiences during blended learning intervention time using a 5-point Likert scale, ranging from 1 = "never" to 5 = "always". In the second section of the SEEI, students rated statements about their use of the SMTS on a 5-point Likert scale ranging from 1 = "strongly disagree" to 5 = "strongly agree". The full SEEI can be seen in Appendix C.

Wang, Bergin, and Bergin's (2014) Classroom Engagement Inventory was adapted to build the first section of the SEEI for this study. The Classroom Engagement Inventory was designed to capture three dimensions of classroom engagement, including affective, behavioral, and cognitive dimensions (Wang et al., 2014). The authors validated this tool using exploratory factor analysis and confirmatory factor analysis (Wang et al., 2014). Using this tool was appropriate in this study as SRL skills also have affective, behavioral, and cognitive components (Schunk & Greene, 2018). The original Classroom Engagement Inventory (Wang et al., 2014) begins each survey item with "In this class". In order to measure students' specific interactions with the blended learning intervention time in this particular study, this was modified to read "During blended learning intervention time" to more accurately collect students' experiences with the

blended learning intervention time. All other aspects of the Classroom Engagement Inventory were kept the same.

The second section of the SEEI was adapted from a rating scale used to measure students' perceptions of a math intervention (Bryant et al., 2020). Permission was obtained from the author to adapt and use this scale. Of these 22 items, only items 11-22 were used in this study, and each was adapted to create the second section of the SEEI. These items were chosen because they reference "charting," which the authors use to refer to performance tracking (Bryant et al., 2020). This was in line with one of the main goals of the SMTS, which was to assist students with tracking their performance and visually seeing this progress over time. For the purpose of this study, "Charting" was replaced with "Using the SMTS" to more accurately reflect the intervention used and collect information about students' experiences using the SMTS tool. Other than this, all other language in the items was kept the same (see Appendix C). Reliability and validity information for the original instrument are currently under review. Additionally, as this tool does not have published reliability and validity information available at the current time, triangulation of data was used to compare students' responses on this section of the SEEI to their qualitative responses in focus group interviews and in their SMTS open-ended responses. Used together, both parts of the SEEI helped to better understand students' experiences while using blended learning and while using the SMTS.

Qualitative Data Sources

In the following section, qualitative data sources will be described in detail.

Focus group interviews. The purpose of this study was to explore how the intervention impacted students' SRL skills, academic performance, and overall

experience in an English language arts class. Although academic performance can be easily observed via the collection of grades and assessment data, and SRL can be evaluated using quantitative surveys, overall experiences are hard to observe and measure directly. Because of this, interviews were utilized to collect more information about this aspect of the study that was difficult to observe (Creswell & Creswell, 2018). Focus group interview responses were also utilized to provide more context and detail regarding students' academic performance as a result of the intervention. Tracy (2020) describes interviews as using "night vision goggles", as they can illuminate phenomena that would otherwise be hidden to the researcher.

A focus group interview format was chosen because focus groups can often generate a high volume of ideas by virtue of the collaborative nature of this type of interview (Coenen, Stamm, Stucki, & Cieza, 2012). In a group setting, participants can be better able to clarify and communicate complex ideas than if they were in an individual setting (Coenen et al., 2012). Focus groups also allow for the researcher to view agreements and disagreements, as well as differing opinions within focus group participants (Morgan, 1988).

The focus group interviews were semi structured, in that they were guided with flexible questions and probes (Tracy, 2020). Using a semi structured interview allowed for the focus group interviews to adapt based on the information that the participants provided (Tracy, 2020). Semi structured focus group interviews typically allow for both content and emotion to come through, as the participants have more freedom to discuss what is most interesting to them (Tracy, 2020). Because of this freedom, this type of

interview structure allowed me to more fully explore students' experiences with the intervention.

I conducted three focus group interviews, with one focus group formed from each class. Six students from each class were selected to participate in focus group interviews, for a total of 18 interview participants. Focus groups typically contain six to eight interviewees per group (Creswell & Creswell, 2018). These students were purposefully selected. In qualitative data collection, the purposeful selection of participants allows the researcher to best understand the research question (Creswell & Creswell, 2018). For each focus group, two low-performing students, two mid-performing students, and two high-performing students were chosen to participate in focus group interviews. These students were also chosen to reflect the demographics of the school population. Content questions were created in alignment with this study's research questions. Table 3.10 displays the interview questions that were aligned with each research question used in this study.

Table 3.10 *Focus Group Interview Question Alignment*

Research question	Focus group interview questions
RQ1: How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?	1. Can you share with me some ways that the blended learning intervention time impacted your existing learning strategies? 5. Can you share with me some ways that using the SMTS might have impacted how you plan your existing learning strategies?
RQ2: How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?	1. Can you share with me some ways that the blended learning intervention time impacted your existing learning strategies?

Research question	Focus group interview questions
RQ3: How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?	2. What were your overall opinions about the blended learning intervention time? a. Can you tell me more about _____? 3. Share with me what you found to be the best parts of the blended learning intervention time. 4. Tell me what were the worst parts of the blended learning intervention time. 6. What were your overall opinions about using the SMTS? a. Can you tell me more about _____? 7. Share with me what you found to be the best parts of using the SMTS. 8. Tell me what were the worst parts of using the SMTS.

Prior to conducting the focus group interviews, an interview protocol was developed. As suggested by Creswell and Creswell (2018), this protocol included basic information about the interview to discuss with participants, an introduction, an opening question, content questions, probes to use as needed, and a closing statement and instructions. These focus group interviews were conducted during students' homeroom time after the intervention has been delivered and were video recorded to be transcribed later. Member checking was employed to ensure the validity of the transcriptions. Each focus group interview lasted about 20 minutes. The focus group interview protocol can be seen in Appendix D.

SMTS open-ended responses. The SMTS included both fixed and open-ended response options for students. The open-ended response questions included: "Why do you think you earned this score?"; and "Next Steps". The "Why do you think you earned this score" question was designed to assist students in thinking through what cognitive and behavioral actions could have led them to earning a certain score, as well as help students

to make some assessments about their self-efficacy for the tasks involved in the assignment. This open-ended response aligns with the self-efficacy scale of the adapted MSLQ, as students were revealing their perceived competence and confidence in performance of class work. The "Why do you think you earned this score" section of the SMTS also gave students a place to voice their setbacks or gains in their academic performance. The "Next steps" prompt was designed to help students make a plan for future learning or revise their current plan. This open-ended response aligns with the self-regulation scale of the adapted MSLQ, in that students were revealing their planning processes. Students with developed SRL reflect on their learning and performance and make plans and adjustments for future learning (Broadbent et al., 2021; Pintrich & DeGroot, 1990; Zimmerman, 2000; Zimmerman & Martinez-Pons, 1986). Because of this, capturing evidence of students reflecting on their performance and making plans for future learning supports this study's inquiry into students' SRL.

Students' responses to these open-ended sections of the SMTS were collected and analyzed in order to gain a more comprehensive understanding of students' thought processes, goal setting and planning, and perception of their successes or failures on class assignments.

Data Analysis

In this section, data analysis methods are outlined. The alignment between research questions, data sources, and data analysis methods can be seen in Table 3.11. As this is a mixed-methods study, both quantitative and qualitative data analysis methods will be used. Specifically, this study followed a convergent parallel mixed methods design, meaning that both quantitative and qualitative data were collected and analyzed

separately, and the results were compared to confirm or disconfirm each other (Creswell & Creswell, 2018). Quantitative data analysis methods will be detailed first, followed by qualitative data analysis methods.

Table 3.11 *Research Question and Data Analysis Alignment*

Research questions	Data sources	Data analysis
1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?	• MSLQ • Focus Group Interviews • SMTS open-ended responses	• Descriptive statistics • Paired samples t-test • Inductive analysis
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?	• Teacher scoresheet	• Descriptive statistics • Paired samples t-test
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?	• SEEI • Focus Group Interviews	• Descriptive statistics • Inductive analysis

Quantitative Data Analysis

In the following section, data analysis methods for quantitative data will be detailed for the three quantitative instruments being used in this study: (1) MSLQ; (2) Teacher scoresheet; and (3) SEEI. For all quantitative data sources, descriptive statistics were calculated and reported. The descriptive analysis indicated the means, standard

deviations, frequencies, or range of scores depending on the variable being studied (Creswell & Creswell, 2018).

Motivated Strategies for Learning Questionnaire (MSLQ). Descriptive statistics were calculated and reported for both the pre-test and the post-test MSLQ. Descriptive statistics provided quantitative pre- and post-test evaluation of students' motivation and SRL skills before and after the intervention. Descriptive statistics were calculated and reported for each of the five scales of the adapted MSLQ (see Appendix B). The scales and corresponding item numbers can be seen in Table 3.12. Next, the statistical software JASP was used to run a paired samples t-test for each scale, in which the pre-test mean values were compared to the post-test mean values. A Bonferroni-corrected 0.05 significance level was used to determine if the differences between the means were statistically significant (Mertler, 2020).

Table 3.12 *Adapted Motivated Strategies for Learning Questionnaire Scales and Corresponding Item Numbers*

Scale	Item numbers
Self-Efficacy	2, 7, 10, 11, 13, 15, 20, 22, 23
Intrinsic Value	1, 5, 6, 9, 12, 17, 18, 21, 25
Test Anxiety	3, 14, 24, 27
Cognitive Strategy Use	30, 31, 33, 35, 36, 38, 39, 42, 44, 47, 53, 54, 56
Self-Regulation	32, 34, 40, 41, 43, 45, 46, 52, 55

Note. Adapted Motivated Strategies for Learning Questionnaire scales (Pintrich & DeGroot, 1990).

Teacher scoresheet. The teacher scoresheet provided quantitative evidence of students' grades on class assignments, frequency of reassessment and extension on assignments, and frequency of missing assignments. This data was collected as pre-test

data before the intervention was administered, and as post-test data after the intervention was administered. Descriptive statistics were calculated and reported for both the pre-test data collection period and the post-test data collection period. Next, the statistical software JASP was used to run a paired samples t-test in order to compare the pre-test mean values to the post-test mean values. Changes in students' average class assignment grades showed any change in their overall academic performance. Changes in frequency of reassessment or extension, as well as frequency of missing assignments, showed any change in effort that students were putting into their classwork. A Bonferroni-corrected 0.05 significance level was used to determine if the differences between the means were statistically significant (Mertler, 2020).

Student Engagement and Experience Inventory (SEEI). Responses from the SEEI were collected for both Part A (referring to the blended learning intervention time) and Part B (referring to the SMTS). For each item within these sections, descriptive statistics were calculated and reported. Items with significantly high or significantly low central tendency measures were focused on for further explanation from qualitative data.

Qualitative Data Analysis

In the following section, data analysis methods for qualitative data will be detailed for the two qualitative data sources being used in this study: (1) Focus Group Interviews, and (2) SMTS Open-Ended Responses. For all of these data sources, inductive analysis was used to analyze the qualitative data gathered. This process will be discussed first, and then specific processes for each of the qualitative data sources will be outlined. Pseudonyms were generated for each research participant, and they are referred to in the writing with they/them pronouns to protect the identity of each participant.

Inductive analysis. Inductive analysis is the process of reducing the volume of information collected in order to identify and organize data into emerging themes and patterns (Mertler, 2020). With convergent parallel mixed methods design, qualitative data analysis can be used to further explain and corroborate quantitative data findings (Creswell & Creswell, 2018). Prior to any qualitative analysis taking place, the transcripts of the focus group interviews were reviewed by myself as well as member checked by my participants. I performed a close reading of the text in order to familiarize myself with it and understand the themes of the responses (Creswell & Creswell, 2018; Thomas, 2006). After gathering a fuller understanding of the data, I read through the responses again.

Inductive analysis involves coding in order to reduce the volume of qualitative data in manageable themes (Mertler, 2020). To begin the coding process for the qualitative data in this study, I used *Structural Coding*, as this type of coding is often used as a foundation for more detailed future coding (Saldaña, 2016). For this round of coding, I moved through each sentence of all qualitative data, and coded by aligning each sentence to one of the research questions guiding this study, for a total of three codes generated. Each code was marked using the coding functionality in Delve coding software. The next phase of coding relied upon identifying students' actions, using *Process Coding*. The Process Coding lens is sometimes also referred to as "action coding" because of how it uses gerunds to mark action in the data (Saldaña, 2016). I read through each sentence of qualitative data and coded any student actions using the coding functionality in Delve coding software. For my third round of coding, I used the *Emotion Coding* lens, which labels the emotions that participants either state having or can be

inferred based on their responses (Saldaña, 2016). For each sentence of qualitative data, I coded any student emotions I saw using the coding functionality in Delve coding software. For my fourth and final round of first-cycle coding, I coded through the *In Vivo Coding* lens in order to capture students' experiences through their direct words (Saldaña, 2016). Reading through each sentence of the qualitative data, I coded any direct quotes that seemed important or seemed to add insight to any of the research questions using the coding functionality in Delve coding.

After the data had been initially coded, I described the main features of the data. In this stage, I began to make connections between the data and the codes I had generated and the research questions of this study (Mertler, 2020). To make sure my findings were as accurate as possible, data that contradicts themes that have emerged were included in analysis (Mertler, 2020). Finally, I interpreted the data. In this stage, I examined the coded categories and looked for relationships, similarities, contradictions, and watched for themes of the data to emerge. These themes began to help me to answer my research questions (Mertler, 2020).

Focus group interviews. The focus group interviews were used to supplement MSLQ data with qualitative explanations of students' SRL skills and their experiences in class as a result of the intervention used in this study. For focus groups, qualitative data was collected from three focus groups (one focus group from each class), with six students forming each group. Interviews were transcribed into a word processing document from the recorded sessions in order to organize and prepare the data for analysis (Creswell & Creswell, 2018). Inductive analysis was then used to derive themes and concepts from the raw interview data (Mertler, 2020; Thomas, 2006).

SMTS open-ended responses. Data from the SMTS open-ended responses was used to augment MSLQ data with qualitative evidence of students' reflections on their learning and planning skills used to complete class work. SMTS open-ended responses were collected from students' individual SMTS documents and transferred into one document to analyze together and prepare for further analysis (Creswell & Creswell, 2018). For ease of analysis, a table was created in a word processing document, with a column for each response option. Individual student responses for each response option were transferred into the respective column in order to be analyzed together. After the raw data had been organized, inductive analysis was used to code the data and generate themes (Mertler, 2020; Thomas, 2006).

Plan to Represent Findings

In order to present my data analysis in a clear and easy to understand way, I combined data by research question. This allowed me to show how both quantitative and qualitative data worked together to answer each research question. See Table 3.6 for a description of how each data source will be used to answer the corresponding research questions. For each research question, I will use a table display to represent assertions and show evidence from the relevant data sources.

Procedures and Timeline

This study took place beginning in the spring of 2022 and ended in the summer of 2023 and consisted of six phases: Phase 1: Consent; Phase 2: Pre-test Data Collection; Phase 3: Intervention Application; Phase 4: Post-test Data Collection; Phase 5: Data Analysis; and Phase 6: Sharing Results. Table 3.13 summarizes the activities and timeframe of each phase.

Table 3.13 *Action Research Procedures & Timeline*

Phase	Timeframe	Researcher activities	Student activities
Phase 1: Consent	Spring 2022-September 9, 2022	• Obtain district and university IRB approval • Obtain informed consent and assent.	• Ask questions about the study • Complete assent forms after receipt of parent consent
Phase 2: Pre-test Data Collection	4 Weeks: September 12-October 7, 2022	• Administer pre-test MSLQ • Compile student demographic information • Compile pre-test data including: students' grades on assignments, frequency of reassessment, extension, and missing assignments	• Complete pre-test MSLQ
Phase	Timeframe	Researcher activities	Student activities
Phase 3: Intervention Application	6 Weeks: October 10-November 18, 2022	• Begin intervention, including blended learning interventions and use of SMTS	• Participate in intervention activities
Phase 4: Post-test Data Collection	4 Weeks: November 21-December 16, 2022	• Administer post-test MSLQ • Administer Student Engagement & Experience Inventory (SEEI) • Compile post-test data including: students' grades on assignments, frequency of reassessment, frequency of extension, frequency of missing assignments • Conduct focus group interviews	• Complete post-test MSLQ • Complete SEI • Participate in focus group interviews
Phase 5: Data Analysis	January-April 2023	• Transcribe qualitative data sources • Analyze both quantitative and qualitative data • Member checking	• Review transcripts • Review findings for accuracy
Phase 6: Sharing Results	Summer and Fall 2023	• Final defense of dissertation research • Share findings with stakeholders • Share findings with professionals in the field	

Phase 1: Consent

Phase 1 began in the spring semester of 2022 and ended two weeks into the 2022-23 academic school year. During the spring of 2022, I received school district and University of South Carolina IRB approval. Building administrator, school district, and IRB approval for this study can be seen in Appendix F, Appendix G, and Appendix H. Once the academic school year began in the fall, I informed students and parents of the purpose of my study and the methods being used. I also distributed information regarding my study via an email to students and parents. After this initial email, I held a virtual information meeting for students and parents. At this meeting, I provided the details of my study and I answered any questions that students or parents had about the study before obtaining written parental consent (see Appendix E) and written student assent (see Appendix E) from those whose parents had offered consent for their participation in the study.

Phase 2: Pre-test Data Collection

Phase 2 lasted four weeks. During this phase, the following data was compiled: student population demographic information, students' grades on assignments, frequency of reassessment, frequency of extension, frequency of missing assignments. This data was recorded on a spreadsheet over the four-week timeframe and averaged to provide a single pre-test value for each type of data. Additionally, I administered the MSLQ pre-test survey to students via a Google Form that they accessed in their Google Classroom LMS. Students completed the MSLQ during the September 12, 2022 class time, but completion of the survey was not graded.

Phase 3: Intervention Application

Phase 3 lasted six weeks. The intervention that I used combined students' use of the SMTS to track their progress in my class with blended learning intervention time that was intended to give students the necessary time, materials, and support to regulate their learning. During the intervention, I narratively reflected on the intervention in an informal researcher journal.

Phase 4: Post-test Data Collection

Phase 4 lasted four weeks. During the first week of this phase, I administered the post-test MSLQ to students, which they completed under the same conditions and in the same format as the pre-test MSLQ. In addition to the collection of quantitative data, I collected qualitative data by conducting focus group interviews. The focus group interviews were recorded and took place in class during the week of November 28. Qualitative data from open-ended responses from students' SMTS entries were collected and organized into a document that were analyzed in Phase 5. Post-test data was compiled and recorded from November 21 through December 16, including students' grades on assignments, frequency of reassessment, frequency of extension, and frequency of missing assignments. Each of these post-test data points were averaged in order to compare to the pre-test averages.

Phase 5: Data Analysis

Phase 5 lasted from January to April of 2023. During this time, I began by completing descriptive statistics and a parametric test for quantitative data. For my qualitative data, I first transcribed both the focus group interviews. The open-ended

responses on the SMTS were compiled and placed separately into one document in Phase 4. I used inductive analysis to code and look for emerging themes from all qualitative data sources. After analyzing all data, I involved my students in member checking to ensure the accuracy of the findings.

Phase 6: Sharing Results

Phase 6 began in summer of 2023 and ended in fall of 2023. During this phase, I delivered the final oral defense of my dissertation research to my dissertation committee at the University of South Carolina. After the successful defense of my research, I shared findings of my research with stakeholders. Findings were organized into a presentation and delivered to students, their parents, and interested school district staff. This presentation was delivered to students in-person during class time, and was delivered to school staff and students' parents via email. My research findings were also shared at local, state, and national conferences. These conferences included Minnesota Council of Teachers of English and Association for Educational Communications and Technology as well as considering moving my dissertation writing into a journal publication.

Rigor & Trustworthiness

In this section, the methods used to ensure rigor and trustworthiness will be described. This study employed multiple methods for rigor and trustworthiness, including triangulating data, member checking, keeping a researcher journal, and peer debriefing (Creswell, 2013; Creswell & Creswell, 2018; Mertler, 2020; Shenton, 2004).

Triangulation of Data

As this is a mixed-methods study, both quantitative and qualitative data were collected and compared in order to answer the research questions. These data sources

were collected and triangulated to better justify the assertion of certain themes and conclusions (Creswell, 2013; Creswell & Creswell, 2018; Shenton, 2004). Triangulation of data sources is a common practice in mixed-methods studies, as it pursues convergence across qualitative and quantitative sources (Creswell, 2013). Triangulation of data sources can also be used to check for convergence among multiple qualitative sources, and if similar themes emerge across different data sources, this process can add to the validity of the study (Creswell, 2013; Merriam, 1998). In this study, data was triangulated for each research question. For Research Question 1 and Research Question 2, qualitative data sources were also triangulated with quantitative data sources to enhance the rigor of this action research and to cross-check the accuracy of the data collected (Mertler, 2020). Table 3.12 shows the multiple data sources that will be triangulated for each research question.

For Research Question 1, the MSLQ, a quantitative data source, was triangulated with qualitative data sources including focus group interviews and SMTS open-ended responses. Doing this helped to support themes and thus increase the validity and credibility of the assertions. The themes that occurred in multiple datasets were considered more heavily than themes that only occurred in one dataset. Triangulation of data can also occur when a wide range of informants is provided in the qualitative data collection (Shenton, 2004). For this study, multiple students were selected to participate in focus group interviews, which provided this study with a fuller and richer dataset to draw from.

For Research Question 2, quantitative data sources were used to evaluate students' academic performance, including students' frequency of reassessment,

frequency of extension, number of missing assignments, and scores on assignments. These were supplemented with students' qualitative focus group interview responses and their open-ended SMTS responses. By triangulating these data sources, I was able to more accurately assess how students are performing academically. Additionally, collecting multiple forms of quantitative data allowed me to more fully answer the research question. Quantitative data can sometimes be limited due to its numerical constraints, but multiple quantitative sources used together can often be greater than the sum of their parts in terms of exploring a research topic (Elman, 1995).

For Research Question 3, quantitative data was triangulated with qualitative data in order to present a trustworthy representation of students' experiences and perceptions of the intervention used in this study (Mertler, 2020). Quantitative data was collected from the SEEI in order to compare numerical outcomes with the themes that emerged from the focus group interviews.

Member Checking

Member checking was used in this study in order to determine the accuracy of qualitative findings (Creswell & Creswell, 2018). Member checking occurred at two points. First, focus group participants were asked to review their respective interview transcripts to verify the accuracy of these transcriptions (Mertler, 2020). I provided each participant with a copy of their specific responses to review for accuracy. The second point of member checking occurred after I analyzed the qualitative focus group interview data. I summarized the major themes that I identified from inductive analysis with the focus group interview participants to determine if they perceived my findings to be accurate before proceeding (Creswell & Creswell, 2018).

Keeping a Researcher Journal

Throughout this research, I used an informal researcher journal to record observations and to reflect on feelings and interpretations associated with those observations (Mertler, 2020). This journal was kept on a digital word-processing document so that it could be easily added to both quickly during class time and more extensively outside of class time. The researcher journal was kept on a password-protected computer, and I was the only person to access the journal and read it. Using this journal to record observations and reflect on those observations helped facilitate thick description. Having a system to reflect on what occurs in class helped me to go beyond surface level understandings and more carefully and deeply consider the meaning of both students' and my own behaviors (Tracy, 2020).

Peer Debriefing

Peer debriefing was also used in this study to review the research process and identify possible problematic data collection or analysis techniques (Mertler, 2020). Peer debriefing consists of locating an individual that will question the researcher about the research process and about the research findings (Creswell, 2013). For this study, this process occurred with my dissertation chairs. Additionally, at two points in my dissertation research process, I received input from my dissertation committee members. I met weekly with one of my dissertation chairpersons to outline my data collection methods and data analysis methods. This ensured that these steps were taken in a valid and ethical manner. This process helped to boost the accuracy of the study as it was reviewed by researchers that were not involved in the study (Creswell & Creswell, 2018). Additionally, having this study questioned and reviewed by my dissertation committee

members allowed for multiple researcher perspectives to be addressed and highlighted any flaws in the study design to be illuminated and solved prior to the completion of the study (Shenton, 2004).

Plan for Sharing and Communicating Findings

In this section, my plan for sharing and communicating the findings of this study will be detailed. Sharing the results of action research studies is an important way to close the gap between theory and practice (Mertler, 2020). If the intervention shows to be successful, the intervention could become a standard practice in my classroom, and further cycles of research could be used to fine-tune the intervention. Additionally, sharing the results of this study allowed for other practitioners to use any methods that were found to be beneficial (Mertler, 2020). I planned to share the results of this study locally via presentations to stakeholders, and nationally via journal article publications and professional conferences.

Locally

Before sharing with a larger audience, the findings of this study were shared with the participants themselves in order to establish transparency and reciprocity. To do this, a simplified research report was distributed to both participants and parents/guardians of the participants and candidly outlined how the research was conducted and what the major findings were, along with the next steps that could be undertaken in the classroom (Tracy, 2020). Participants also had an opportunity during regular class time to discuss the results of the study and provide either vocal or written input for moving forward. The results of the study were presented to the school principal for feedback and approval. Findings were also presented to other teachers at Branch Middle School in the way of an

informal presentation in the school building during an eighth-grade team meeting and subject-matter professional learning community (PLC) meetings, along with a staff meeting that included all faculty and administrators. These presentations focused on background information, the purpose of the study, the methodology used, the results, the conclusion, and the resulting action plan in order to provide other teachers with practices that they will be able to transfer to their own classrooms (Mertler, 2020). The identities of the participants were kept confidential by not using any identifying information in the research report and by using pseudonyms for qualitative data and responses included in the writing. Additionally, data was presented on a class-wide scale, avoiding the use of individual participant identification.

Nationally

In order to communicate the findings of my study on a larger scale, I also presented findings at professional conferences. These conferences included annual conferences held by the Minnesota Council of Teachers of English and the Association for Educational Communications and Technology. Sharing research findings at professional conferences provides a larger scale opportunity for dialogue with peers in the same field of study about my research findings (Mertler, 2020). I will also consider moving my dissertation writing into a journal publication.

CHAPTER 4

ANALYSIS AND FINDINGS

The purpose of this action research was to evaluate the effects of weekly blended learning interventions combined with a researcher created self-monitoring achievement system on students' self-regulated learning skills in an eighth-grade English language arts classroom at Branch Middle School. The following research questions guided this study:

1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' perceptions and experiences of learning English language arts content?

In this section, quantitative and qualitative findings will be presented along with the researcher's analysis of these findings. Quantitative findings will be presented first, followed by analysis. Qualitative findings and analysis will be presented after.

Quantitative Findings and Analysis

Three quantitative data sources were used in this study: (1) Motivated Strategies for Learning Questionnaire (MSLQ); (2) Teacher Scoresheet; and (3) Student

Engagement & Experience Inventory (SEEI). In this section, I will first report findings from a test of reliability to determine the internal consistency for the MSLQ and the SEEI used in this study. Conducting a test of internal consistency is a common way to test reliability of a questionnaire (Tavakol & Dennick, 2011). For this study, a Cronbach's alpha was calculated for each quantitative instrument, as Cronbach's alpha is the most widely used objective measure of reliability (Tavakol & Dennick, 2011). Cronbach's alpha values range from 0 to 1 and indicate the internal consistency of a specific test or scale (Tavakol & Dennick, 2011). Next, descriptive statistics will be reported for all quantitative instruments. The descriptive analysis will indicate the means and standard deviations of the variables being studied (Creswell & Creswell, 2018). As indicated by a Shapiro-Wilk test of normality of each data source, either a parametric or nonparametric analysis was run to validate if the data collected is normally distributed. This test was used because it is a common method to check for normality within a dataset (Razali & Wah, 2011). Having administered the MSLQ and collected data from the Teacher Scoresheet both pre and post to this study's intervention, a paired samples *t*-test was run to determine whether there was any significant change after the intervention was applied. All statistical analyses were completed in JASP (JASP Team, 2022). The significance of these findings will be discussed.

Motivated Strategies for Learning Questionnaire

Outcomes of the MSLQ data were analyzed to see if there were changes in the students' SRL skills secondary to the intervention used in this study. An adapted version of the MSLQ (Pintrich & DeGroot, 1990) was used, which includes five different scales: (1) Self-Efficacy; (2) Intrinsic Value; (3) Test Anxiety; (4) Cognitive Strategy Use; and

(5) Self-Regulation. The adapted MSLQ was given to students before the intervention and after the conclusion of the intervention. For ease of distribution and data collection, the adapted MSLQ was transferred to a digital format using Google Forms, and students submitted their responses using their iPads. Before completing calculations, questions that were negatively worded were reverse scored.

Reliability. A test of reliability was first run to determine the internal consistency (Tavakol & Dennick, 2011) of each subscale of the MSLQ, as well as the overall MSLQ (see Table 4.1). The following guidelines were used to interpret the Cronbach's alpha for each subscale of the MSLQ: $\alpha > .9$ = Excellent, $.9 < \alpha > .8$ = good, $.8 < \alpha > .7$ = Acceptable, $.7 < \alpha > .6$ = Questionable, $.6 < \alpha > .5$ = Poor, and $\alpha < .5$ = Unacceptable (George & Mallery, 2003). The Cronbach's alpha test revealed there to be excellent reliability, or internal consistency, of both the pre-test Self-efficacy subscale ($\alpha = .93$) and the post-test Self-efficacy subscale ($\alpha = .94$). The Cronbach's alpha test revealed there to be excellent reliability, or internal consistency, of both pre-test Intrinsic Value subscale ($\alpha = .91$) and the post-test Intrinsic Value subscale ($\alpha = .93$). The Cronbach's alpha test revealed there to be good reliability, or internal consistency, of the pre-test Test Anxiety subscale ($\alpha = .81$), and excellent reliability, or internal consistency, of the post-test Test Anxiety subscale ($\alpha = .92$). The Cronbach's alpha test revealed there to be good reliability, or internal consistency, of the pre-test Cognitive Strategy Use subscale ($\alpha = .86$), and excellent reliability, or internal consistency, of the post-test Cognitive Strategy Use subscale ($\alpha = .91$). The Cronbach's alpha test revealed there to be acceptable reliability, or internal consistency, of both the pre-test Self-Regulation subscale ($\alpha = .75$), and the post-test Self-Regulation subscale ($\alpha = .78$). For the MSLQ overall, the

Cronbach's alpha test revealed there to be excellent reliability, or internal consistency of both the pre-test (α = .95), and the post-test items (α = .96).

Descriptive statistics. To summarize the pre-test and post-test MSLQ data, descriptive statistics were first utilized, including the calculation of the mean and standard deviation (Creswell, 2014). The mean and standard deviation for the pre-test and post-test for all five subscales of the adapted MSLQ, as well as the overall adapted MSLQ, were calculated to determine if the intervention used in this study impacted students' SRL skills (see Table 4.1).

Table 4.1 *Cronbach's Alpha Scores and Descriptive Statistics for the Motivated Strategies for Learning Questionnaire Pre-test and Post-test (N=45)*

MSLQ Scale	*α*		*M*		*SD*	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Self-Efficacy	.93	.94	5.21	5.19	1.10	1.01
Intrinsic Value	.91	.93	4.86	4.81	1.12	0.98
Test Anxiety	.81	.92	3.14	3.39	1.65	1.41
Cognitive Strategy Use	.86	.91	4.62	4.60	1.10	0.90
Self-Regulation	.75	.78	4.78	4.67	0.91	0.88
MSLQ Overall	.95	.96	4.69	4.70	0.80	0.92

The adapted MSLQ used a 7-point Likert scale, where 1 = *not at all true of me* and 7 = *very true of me* (Pintrich & DeGroot, 1990). The Self-Efficacy subscale of the MSLQ had the highest mean score on both the pre-test (*M* = 5.21, *SD* =1.02) and the post-test (*M* = 5.19, *SD* = 1.10). An example of a question from the Self-Efficacy subscale is item 2, "Compared with other students in this class I expect to do well". The Test Anxiety

subscale of the MSLQ had the lowest mean score on both the pre-test (M = 3.14, SD = 1.41) and the post-test (M= 3.39, SD = 1.65). An example of a question from the Test Anxiety subscale is item 3, "I am so nervous during a test that I cannot remember facts I have learned."

Inferential statistics. Before completing a paired samples *t*-test for this instrument, I checked each of the five scales and the overall MSLQ for normality by running a Shapiro-Wilk test. This test was used because it is a common method to check for normality within a dataset (Razali & Wah, 2011). Table 4.2 shows the results of this test for each of the MSLQ scales as well as the overall MSLQ. A *p*-value of less than .05 was used to determine if there was a significant deviation from the normal curve (Mbah & Paothong, 2015). There were no *p*-values less than .05, meaning the data was normally distributed, so a paired samples *t*-test was used to determine if there was any significant change between the pre-test and the post-test scores. For all paired samples *t*-tests, JASP was used to determine if the post-test MSLQ values were greater than the pre-test values.

Table 4.2 *Shapiro-Wilk Test for Motivated Strategies for Learning Questionnaire*

Scale	*p*-Value
Self-Efficacy	.67
Intrinsic Value	.05
Test Anxiety	.39
Cognitive Strategy Use	.97
Self-Regulation	.86
MSLQ Overall	.27

Note: $p < .05$ used to determine deviation from normality

Because the adapted MSLQ used in this study contained multiple scales, the Bonferroni adjustment was applied to reduce a type I error rate (Mertler, 2020). The type I error rate increases when there are multiple scales or multiple comparisons being made (Streiner & Norman, 2011). Using the Bonferroni correction helps to avoid reporting false positives (Streiner & Norman, 2011). For this study, an alpha level of .01 was used as the threshold for determining if the results of the paired samples *t*-test were statistically significant for the MSLQ pre-test and post-test. The data outcomes show there to be no significant findings for the full MSLQ nor for any specific subscale of the MSLQ (see Table 4.3).

Table 4.3 *Paired Samples t-Test for the Motivated Strategies for Learning Questionnaire*

Scale	*t*	*df*	*p*
Self-Efficacy	-0.19	44	.70
Intrinsic Value	-0.51	44	.70
Test Anxiety	1.41	44	.08
Cognitive Strategy Use	-0.29	44	.62
Self-Regulation	-1.02	44	.84
MSLQ Overall	0.17	44	.43

Note: $p < .01$ used to determine significance

The data analysis for the MSLQ overall indicated that participants responded lower on the pre-test ($M = 4.69$, $SD = 0.80$) than on the post-test ($M = 4.70$, $SD = 0.92$), though there was no statistical significance of the difference, $t(44) = 0.17$, p =.43. Students' Self-Efficacy scores did not improve after the intervention, but the decrease was not statistically significant (pre-test $M = 5.21$, $SD = 1.11$; post-test $M = 5.19$, $SD =$

1.10; $t(44) = -0.19$, $p = .70$). Students' Intrinsic Value scores did not improve after the intervention, but the decrease was not statistically significant (pre-test $M = 4.86$, $SD = 0.98$' post-test $M = 4.81$, $SD = 1.12$; $t(44) = -0.51$, $p = .54$). Students' Test Anxiety scores improved after the intervention, but the increase was not statistically significant (pre-test $M = 3.14$, $SD = 1.41$; post-test $M = 3.39$, $SD = 1.65$; $t(44) = 1.41$, $p = .08$). Students' Cognitive Strategy Use scores did not improve after the intervention, but the decrease was not statistically significant (pre-test $M = 4.62$, $SD = 0.90$; post-test $M = 4.60$, $SD = 1.10$; $t(44) = -0.29$, $p = .62$). Students' Self-Regulation scores did not improve after the intervention, but the decrease was not statistically significant (pre-test $M = 4.78$, $SD = 0.88$; post-test $M = 4.67$, $SD = 0.92$; $t(44) = -1.02$, $p = .84$).

Teacher Scoresheet

The Teacher Scoresheet was a data collection source provided by the Branch Public School district and adapted by the researcher prior to this study for daily use in the classroom. The Teacher Scoresheet provided four different sources of data related to students' academic performance, including (1) students' grades on class assignments (academic performance); (2) frequency of students reassessing on assignments (reassessment), (3) frequency of extending on assignments (extension); and (4) the rate of missing assignments students had (missing assignments). Taken together, these data sources provided a more complete picture of students' academic performance in the class.

The Teacher Scoresheet and its subsequent datasets: (1) academic performance; (2) reassessment; (3) extension; and (4) missing assignments, were recorded and calculated for the pre-test and post-test periods. For this instrument, the pre-test period

refers to the data that was compiled by the researcher during the first six weeks of school, prior to the first day of the intervention. The pre-test period data is a snapshot of students' (1) academic performance; (2) reassessment; (3) extension; and (4) missing assignments before engaging with the intervention used in this study. The post-test period refers to the data that was compiled during the six-week period in which the intervention was active. The post-test period data is a snapshot of students' (1) academic performance; (2) reassessment; (3) extension; and (4) missing assignments while engaged in the intervention used in this study. This method of collecting data in the midst of classroom activities is a function of action research (Mertler, 2020).

Academic performance. To calculate the pre-test and post-test value for students' grades on class assignments, students' scores during each period were summed and divided by the total number of graded assignments in that period to determine their mean score. In the pre-test period, there were nine total graded assignments. In the post-test period, there were 11 total graded assignments. Mean scores were entered into a digital spreadsheet in order to store the data and compare pre-test values to post-test values.

Reassessment. To calculate how often students were reassessing on assignments, the number of times a student reassessed was divided by the total number of times that a student needed to reassess. Reassessment was calculated in this way to accurately compare how often students were reassessing given that they needed to reassess. For example, if a student scored below a score of 3 for two assignments and reassessed one time, their reassessment would be a rate of 0.5. For students that had no scores below a 3, they therefore had zero occurrences of reassessment since reassessment was not needed.

For the students with zero occurrences for needing reassessment, their data was not included as a reassessment calculation rate so as to not skew the outcomes of those who did reassess. For the students with zero occurrences for needing reassessment, their data was not included as a reassessment rate of 0.0 did not accurately reflect their work in class and their reassessment behaviors. The rates of students' reassessment on assignments were entered into a digital spreadsheet in order to store the data and compare pre-test values to post-test values.

Extending. To calculate how often students were extending on assignments, the number of times a student extended on an assignment was divided by the number of times that an extension was offered on an assignment; extensions were not offered on every graded assignment. Extension was calculated in this way to accurately reflect the rate with which students were extending on assignments. In the pre-test period, an extension was offered on two assignments. For example, if a student extended on two assignments during the pre-test period, they would have an extension rate of 1.0. In the post-test period, an extension was offered on seven assignments. For example, if a student extended on two of these assignments, they would have an extension rate of 0.29. The rates of students' extension on assignments were entered into a digital spreadsheet in order to store the data and compare pre-test values to post-test values.

Missing assignments. To calculate the rate of missing assignments, the number of missing assignments that students had for the pre-test data collection period and the post-test data collection period was divided by the total number of assignments for that period. There were nine total graded assignments for the pre-test period and 11 total graded assignments for the post-test period. This provided a comparable rate from the

pre-test to the post-test period, as the total number of assignments across the pre-test and post-test period was not equivalent. The rate of each student's missing assignments was entered into a digital spreadsheet in order to store the data and compare the pre-test values to the post-test values.

Descriptive statistics. To summarize the pre-test and post-test Teacher Scoresheet data, descriptive statistics were first utilized, including the calculation of the means and standard deviations (Creswell, 2014). Additionally, ratios expressed as percentages were calculated for all datasets of the Teacher Scoresheet to help describe any changes that occurred between the pre-test and post-test periods. Descriptive statistics are commonly used to summarize data and describe various elements of the participants studied (Bakeman & Robinson, 2005). The mean and standard deviation for the pre-test and post-test for (1) academic performance; (2) reassessment; (3) extension; and (4) missing assignments, were calculated to determine if the intervention used in this study impacted students' academic performance, reassessment, extension, and missing assignments Table 4.4 shows the pre-test and post-test calculations for these variables.

Table 4.4 *Descriptive Statistics for Teacher Scoresheet pre-test and post-test (N=45)*

Dataset	*M*		*SD*	
	Pre-test	Post-test	Pre-test	Post-test
Academic Performance	2.78	3.21	0.36	0.30
Reassessment	0.33	0.87	0.39	0.24
Extension	0.12	0.43	0.24	0.29
Missing Assignments	0.04	0.00	0.12	0.01

For the academic performance variable, students could earn scores ranging from 1-4, where a score of 3 signified grade-level competency. Reassessment and extension were calculated as rates, so the closer to 1.0, the more often students were reassessing or extending. Missing assignments were also calculated as rates, for this variable, a lower rate was preferable to a higher rate.

To help describe and summarize any changes that occurred in students' academic performance, reassessment, extension, and missing assignment behaviors from the pre-test period to the post-test period, ratios expressed as percentages were calculated and are displayed in Table 4.5.

Table 4.5 *Reassessment, Extension, and Missing Assignment Expressed as Percentages*

Academic Performance		Reassessment		Extension		Missing Assignment	
Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
42%	84%	50%	100%	22%	91%	13%	6%

Note: Ratios expressed as percentages. For example, 50% of students were taking reassessment opportunities in the pre-test period, reflecting that half of the students in the study were reassessing.

For the academic performance dataset, in the pre-test period, 42% of students had an average assignment score of 3 (grade level) or higher, while 58% of students had an average assignment score that was lower than 3 (below grade level). In the post-test period, 84% of students had an average assignment score of 3 (grade level) or higher during the post-test period, while 16% of students had an average assignment score that was lower than 3 (below grade level). For the reassessment dataset, in the pre-test period, 50% of students reassessed on at least one assignment, compared to 100% of students

reassessing on at least one assignment during the post-test period. For the extension dataset, in the pre-test period, 22% of students extended on at least one assignment, compared to 91% students extending on at least one assignment in the post-test period. For the missing assignment dataset, in the pre-test period, 13% of students had at least one missing assignment, compared to 6% students having at least one missing assignment in the post-test period.

Inferential statistics. Inferential statistics allow researchers to determine statistical significance of quantitative results (Creswell, 2020). The paired samples *t*-test is a commonly used method in research designs in which participants are pre-tested, engaged in an intervention, and then post-tested (Creswell, 2020). Before running a paired samples *t*-test for the Teacher Scoresheet, I checked each of the datasets for normality using the Shapiro-Wilk test. This test was used because it is a common method to check for normality within a dataset (Razali & Wah, 2011). Table 4.6 shows the results of this test. A *p*-value of less than .05 was used to determine if there was a significant deviation from the normal curve (Mbah & Paothong, 2015).

Table 4.6 *Shapiro-Wilk Test for Teacher Scoresheet*

Dataset	*p*-Value
Academic Performance	.00
Reassessment	.00
Extension	.13
Missing Assignments	$<.001$

Note: $p < .05$ used to determine deviation from normality

Based on the test of normality outcomes, the Academic Performance, Reassessment, and Missing Assignments datasets deviated from normality for my dataset. Because of this deviation from normality, the nonparametric Wilcoxon signed-rank test (Wilcoxon, 1945) was conducted to determine any significant changes between the pre-test and post-test for the Academic Performance, Reassessment, and Missing Assignments dataset. The Extension dataset was normally distributed, so a paired samples *t*-test was run to determine if there was any significant change between the student's extending assignments on the pre-test and the post-test. For this study, an alpha level of .05 was used as the threshold for determining if the results of the paired samples t-test were statistically significant for the Teacher Scoresheet pre-test and post-test (Mertler, 2017). For the Academic Performance, Reassessment, and Extension datasets, Wilcoxon signed-rank test was used to determine if the post-test values were greater than the pre-test values. For the Missing Assignment dataset, a paired samples *t*-test was used to determine if post-test values were less than pre-test values. See Table 4.7 for the inferential statistical outcomes.

Table 4.7 *Teacher Scoresheet Wilcoxon Signed-rank Test*

Dataset	*W*	*z*	*p*
Academic Performance	941.50	5.66	$<.001$
Reassessment	252.00	4.07	$<.001$
Missing Assignments	0.00	-2.20	.018

Note: $p < .05$ used to determine significance

Note: A paired samples *t*-test was used for the Extension dataset: $t(44) = 7.47, p < .001$)

The data analysis for the Academic Performance dataset indicated statistical significance between the pre-test period and the post-test period ($p < .001$). Students had significantly higher grades on class assignments in the post-test period (*Mdn* = 3.27) than in the pre-test period (*Mdn* = 2.89). Data analysis for the Reassessment dataset indicated statistical significance between the pre-test period and the post-test period ($p < .001$). Students reassessed significantly more in the post-test period (*Mdn* = 1.00) than in the pre-test period (*Mdn* = 0.13). Data analysis for the Extension dataset indicated statistical significance between the pre-test period and the post-test period ($p < .001$). Students extended significantly more in the post-test period (*Mdn* = 0.43) than in the pre-test period (*Mdn* = 0.00). Data analysis for the Missing Assignments dataset indicated statistical significance between the pre-test period and the post-test period ($p = 0.02$), although median values for students' missing assignments were the same in the post-test period (*Mdn* = 0.00) as in the pre-test period (*Mdn* = 0.00).

Student Engagement and Experience Inventory

The SEEI was a quantitative survey that collected information from students about their experiences and satisfaction using the SMTS and blended learning intervention time. The SEEI contained two sections: (1) a section devoted to collecting information about students' engagement and experience during blended learning intervention time; and (2) a section devoted to collecting information about students' experience using the SMTS. In the first section of the SEEI, students rated statements about their experiences during blended learning intervention time using a 5-point Likert scale, ranging from 1 = "never" to 5 = "always". In the second section of the SEEI, students rated statements about their use of the SMTS on a 5-point Likert scale ranging

from 1 = “strongly disagree” to 5 = “strongly agree”. The SEEI was converted to a digital format in order to easily distribute it to students via their iPads. Once all students had responded to the survey, results were entered into a digital spreadsheet. Data was calculated and analyzed separately for both of the sections. Before completing calculations, items that were negatively worded were reverse scored.

Reliability. A test of reliability was first run to determine the internal consistency of each section of the SEEI. To determine internal consistency, a Cronbach's alpha was calculated to measure the SEEI for both sections: (1) blended learning, and (2) SMTS. Conducting the Cronbach’s alpha test (Tavakol & Dennick, 2011) revealed there to be very good reliability, or internal consistency, of the first section of the SEEI, which focused on students’ responses to the blended learning time used in the intervention (α = .88). Conducting the Cronbach’s alpha test revealed there to be excellent reliability, or internal consistency, of the second section of the SEEI, which focused on students’ responses to the SMTS used in the intervention (α = .96).

Descriptive statistics. Descriptive statistics are useful in simplifying, summarizing, and organizing large amounts of numerical data (Mertler, 2020). Table 4.8 summarizes the SEEI data from both the blended learning and the SMTS sections. Descriptive statistics were utilized, including the calculation of the mean and standard deviation (Creswell, 2014). For each item within the SEEI, students responded on a 7-point Likert scale, so a score of a 3 indicated neutrality. As a measure of central tendency, the mean indicates with a single numerical score what is typical about a larger group of individuals (Mertler, 2020). As a measure of dispersion, standard deviation indicates the degree to which a dataset is spread (Mertler, 2020).

Table 4.8 *Cronbach's Alpha Scores and Descriptive Statistics for Student Engagement and Experience Inventory*

SEEI Section	*α*	*M*	*SD*
Blended Learning	.88	3.44	0.58
Self-Monitoring Tracking System	.96	3.54	0.80

Additionally, descriptive statistics for each individual item of the SEEI for both the blended learning and the SMTS section were calculated, including the mean and standard deviation. These results are displayed in Table 4.9 and Table 4.10.

Table 4.9 *Descriptive Statistics for Student Engagement and Experience Inventory by Item (Blended Learning Section)*

	Item	*M*	*SD*
1.	I felt interested.	3.53	0.74
2.	I felt proud.	3.47	0.88
3.	I felt excited.	2.94	0.98
4.	I felt happy.	3.31	0.98
5.	I felt amused (smile, laugh, have fun).	2.86	0.99
6.	I got really involved in collaborative activities.	3.56	0.94
7.	I formed new questions in my mind as I worked.	3.22	0.80
8.	I did not want to stop working with my group.	3.06	0.98
9.	I actively participated in class discussion posts.	3.67	0.99
10.	I worked with other students and we learned from each other.	3.42	0.81
11.	I "zoned out," not really thinking or doing classwork.	3.69	0.98
12.	I let my mind wander.	3.56	0.88
13.	I just pretended like I was working.	4.44	0.77

For the blended learning portion of the SEEI, the highest scored item was item 13 (M = 4.44, SD = 0.77). This was a reverse scored item that asked students to rate the statement, "I just pretended like I was working" on a 5-point Likert scale. The high score indicates that students pretending that they were working rarely happened while they were engaged with the blended learning. The lowest scored item for the blended learning portion of the SEEI was item 5 (M = 2.86, SD = 0.99). This item asked students to rate the statement, "I felt amused (smile, laugh, have fun)" on a 5-point Likert scale. The mediocre score of this item indicates that students were neither amused nor non-amused by the work presented to them during the blended learning time of the intervention.

Table 4.10 *Descriptive Statistics for Student Engagement and Experience Inventory by Item (SMTS Section)*

	Item	*M*	*SD*
14.	Using the SMTS motivates me to complete all of the items in the time allowed.	3.39	0.87
15.	Using the SMTS helps me to see how well I am doing over time.	3.97	0.97
16.	Using the SMTS motivates me to do my best to answer all of the items correctly.	3.53	0.91
17.	Using the SMTS is a good use of my time.	3.33	0.89
18.	Using the SMTS helps me understand what I need to work on.	3.78	0.90
19.	Using the SMTS challenges me to change the way I do things when I see a problem I have struggled with in the past.	3.50	0.94
20.	Using the SMTS helps me to learn from my mistakes.	3.53	0.97
21.	Using the SMTS helps me to pay attention to what I'm doing.	3.47	1.03
22.	Using the SMTS helps me keep track of my progress and rewards me as I progress toward my goals.	3.81	0.92
23.	Using the SMTS helps me to find several different possibilities when I want to change something.	3.36	0.87
24.	Using the SMTS helps me pay attention to what I'm doing.	3.39	0.96
25.	Using the SMTS motivates me to think before I act.	3.42	1.18

For the SMTS portion of the SEEI, the highest scored item was item 15 (M = 3.97, SD = 0.97). For this item, students rated the following statement on a 5-point Likert scale, "Using the SMTS helps me to see how well I am doing over time." The high score for this item indicates that the SMTS was most effective in helping students see their progress over the course of the intervention. The lowest scored item for the SMTS portion of the SEEI was item 17 (M = 3.33, SD = 0.89). This item asked students to rate the statement, "Using the SMTS is a good use of my time" on a 5-point Likert scale. The score of this item indicates that students felt ambivalent about the SMTS being a good use of their time in class during the intervention.

Overall, the mean score of 3.44 (SD = 0.58) for the blended learning portion of the SEEI and the mean score of 3.54 (SD = 0.80) for the SMTS portion of the SEEI indicate that students felt slightly above the neutral score of 3 about both the blended learning and the SMTS components of the intervention.

Qualitative Analysis and Findings

To better understand my students' experiences and perceptions of both the blended learning and the SMTS used in this intervention, I conducted three focus group interviews (one for each class section) and compiled the two open-ended question responses found on the SMTS. For the open-ended responses, it should be noted that students typed their responses. I used inductive analysis, which is the process of reducing the volume of information collected in order to identify and organize data into emerging themes and patterns (Mertler, 2020). In an action research study, qualitative data analysis can be used to further explain and corroborate quantitative data findings (Creswell &

Creswell, 2018). In the following section, all quotations are verbatim from participants in order to accurately capture their voices.

The original intended number of total focus group interviewees was 18, but due to a student being absent, the actual number that participated was 17. The SMTS contained two open-ended questions, which were "Why do you think you earned this score?" and "Next Steps" See Table 4.11 for the summary of qualitative data sources.

Prior to analysis, I transcribed each focus group interview and completed member-checking to ensure accuracy (Mertler, 2020). I printed out copies of each transcript and gave the focus group interview participants time in class to read through and either sign off on their accuracy, or mark on the transcript where there was a discrepancy.

Table 4.11 *Summary of Qualitative Data Sources*

Qualitative Data Source	Number of Sources	Number of Codes Applied
Focus Group Interviews	3	187
SMTS Open-Ended Questions	2	93
Total	5	280

None of the students found a discrepancy. For the two SMTS open-ended question responses, I compiled all entries from students' individual SMTS documents into one document for analysis. I then read through all qualitative data to become more familiar with the content before starting the analysis. After completing an initial reading, I imported the focus group transcriptions and the SMTS open-ended question responses into Delve software and conducted four rounds of inductive qualitative data coding. Prior

to beginning the coding process, I discussed various coding options with my dissertation co-chair in order to select coding methods that would best align with my research and with the body of data that I had collected. For each round of coding, I moved through the entire body of qualitative data, using the sentence-by-sentence method of analysis. These four rounds of analyzing the qualitative data produced 280 total codes (see Table 4.12). From this analysis, three themes emerged: (a) Students increased their ownership of learning through self-awareness of successful learning strategies and independence; (b) The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress; and (c) The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished.

Table 4.12 *Summary of Coding by Lens*

Code Lens	Number
Structural	3
Process	158
Emotion	44
In Vivo	75
Total	280

First Cycle Coding

I began with *Structural Coding*, as it is often used as a foundation for more detailed future coding (Saldaña, 2016). For this round of coding, I moved through each sentence of all qualitative data, and coded by aligning each sentence to one of the research questions guiding this study, for a total of three codes generated. For example, one student's focus interview response was, "I know for some of them, especially

testing…I'm not the best at eliminating answers…when we would do those we'd really have to focus on eliminating answers…it helped me kind of learn how to do it better." Because this student referenced a test-taking skill (eliminating answers) and expressed awareness of their own abilities, this piece of data was coded as RQ1, because it best aligns with the concept of SRL that is addressed in the first research question of this study.

Next, I coded through the *Process Coding* lens, which is sometimes also referred to as "action coding" because of how it uses gerunds to mark action in the data (Saldaña, 2016). *Process Coding* denotes both observable action and conceptual action (Saldaña, 2016). For example, one student's SMTS open-ended question response was, "Practice this skill more and use different strategies to help me understand it better" in the Next Steps column of the SMTS. Although there are a few different actions occurring in this sentence, I realized that the main action in this sentence stemmed from "practice," as the student was communicating an intention to practice skills and strategies that could in turn help them to understand content better. So, for this piece of data, the code that emerged was *practicing* (see Figure 4.1). This round of *Process Coding* produced 158 codes including *practicing* as well as *referencing* and *studying* as examples of codes generated.

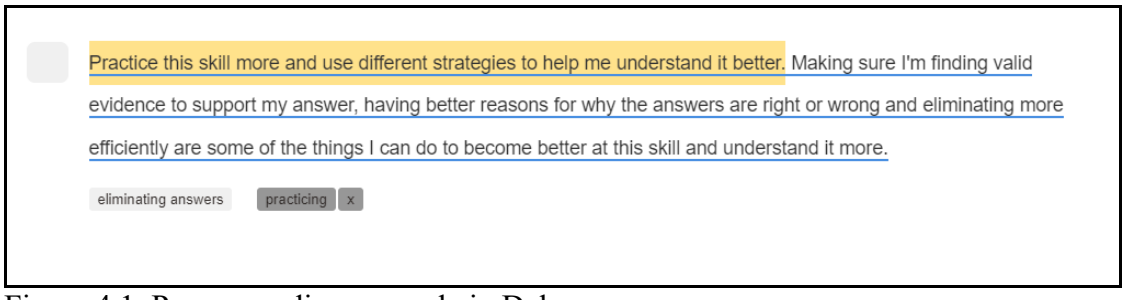


Figure 4.1. Process coding example in Delve

For my third round of coding, I used the *Emotion Coding* lens, which labels the emotions that participants either state having or can be inferred based on their responses

(Saldaña, 2016). An example of a participant directly stating an emotion was evidenced in their focus group interview response: “I really liked blended learning.” This response generated the code *liked*, as it was an emotion towards blended learning that the student explicitly stated. There were also student responses in which an emotion could be inferred. For example, another student stated in a focus group interview that “[Blended learning is] probably my favorite thing of the week to be honest.” Although this student does not directly state an emotion, it can be inferred that they enjoyed blended learning since it is their “favorite thing of the week,” so the code that was produced from this piece of data was *enjoyed*. This round of coding produced 44 codes including *enjoyed, confused*, and *relaxed* (see Figure 4.2).

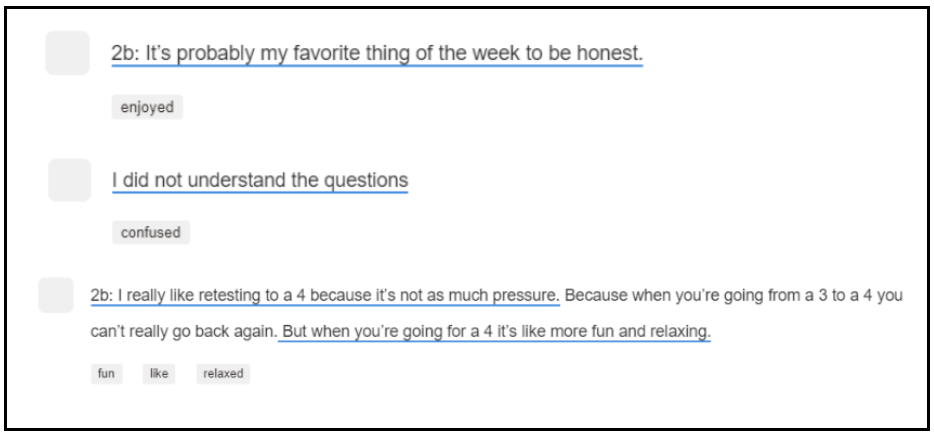


Figure 4.2. Emotion coding example in Delve

For my fourth and final round of first-cycle coding, I coded through the *In Vivo Coding* lens in order to capture students’ experiences through their direct words (Saldaña, 2016). For example, when I asked students in a focus group interview how the SMTS might have impacted how they plan their learning strategies, Blake responded, “It’s hard to see sometimes when you click on something and it’s yellow or red, so it’s like, you should retest. It might have motivated me or fired me up to do better.” Based on their response, this student seemed to care a lot about the coloring of their SMTS document,

which corresponded to their scores in class. I identified the words "*It's hard to see sometimes when you click on something and it's yellow or red"* as the key to this student's experience with the SMTS and thus created this code. This round of coding produced 45 verbatim codes including *"I used the article as a reference throughout the test," "I didn't really remember what happened in the story and guessed on the formative,"* and *"I think it's nice because it's a lot easier to look at than Infinite Campus."*

Transitional Strategy

After the first cycle of coding was complete, code mapping took place where all codes were condensed into manageable groups or subcodes to be analyzed (Saldaña, 2016). The data were exported into Excel from Delve to be analyzed further. From Excel, I was able to view every code in one place. I then read through all my first cycle codes to search for both similarities and synonyms in the codes generated. This was very helpful because it allowed me to see how the codes could be connected or related, and assisted me in reducing the corpus of codes into a more manageable number of codes. This then allowed me to begin to organize my codes into 16 subcodes (see Figure 4.3).

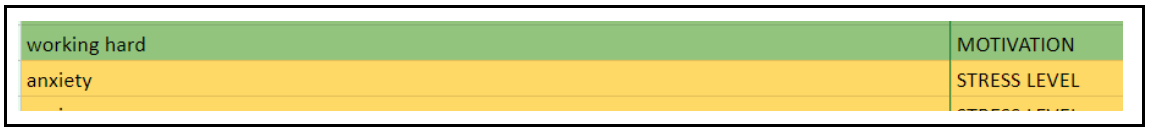


Figure 4.3. Example of Codes to Subcodes

After I completed code mapping, I used the second cycle method of *Pattern Coding* to discover patterns, explanations, and emerging themes (Saldaña, 2016). Prior to starting second cycle coding, I stepped away from the qualitative data analysis process for a couple of days so I could come back with fresh eyes and a clear mind. This process was helpful to take data collected from first cycle coding and understand the meaning behind

it (Saldaña, 2016). I used peer debriefing with one of my dissertation chairs to support and document my decisions. During our discussions about the codes that I had generated, my dissertation co-chair prompted my thinking by asking me several times to think about what my students were experiencing in relation to each code, which helped me to clarify my thinking and eventually allowed for categories and themes to emerge. This transitional process produced nine categories (see Table 4.13): (a) Self-awareness, (b) Reflection About Learning Strategies, (c) Value of SMTS as a Tracking and Monitoring Tool, (d) Self-efficacy and Awareness of Needing Help, (e) SMTS as an Assistive Tool in Recognizing Accomplishments, (f) Opportunity to Improve Academically, (g) Blended Learning Time Reducing Stress About Grades, (h) Students Being Motivated to Improve Their Scores, (i) Reflection Produced Ownership and Agency of the Learning Process. Two of the subcodes which accounted for 29 codes were not consumed into a category, as they reflected students' positive or negative emotions, but did not refer to a specific element of the intervention used in this study or a specific aspect of class. Because of this, they did not move forward into a category.

Table 4.13 *Summary of Categories and Subsumed Subcodes*

Category	Number of Subsumed Subcodes
Self-awareness	3
Reflection About Learning Strategies	6
Value of SMTS as a Tracking and Monitoring Tool	2
Self-efficacy and Awareness of Needing Help	2
SMTS as an Assistive Tool in Recognizing Accomplishments	1
Opportunity to Improve Academically	1
Blended Learning Time Reducing Stress About Grades	1
Students Being Motivated to Improve Their Scores	1
Reflection Produced Ownership and Agency of the Learning Process	2

The first category, Self-awareness, came out of a combination of three subcodes: knowing what to do, awareness of understanding, and metacognition (see Figure 4.4).

"I misread a question, and that caused me to get it wrong."	METACOGNITION
"I needed to read more carefully and try and connect more things and questions to the article with the answers."	METACOGNITION
misreading	METACOGNITION
rushed	METACOGNITION
rushing	METACOGNITION
rushing through	METACOGNITION
being unsure	AWARENESS OF UNDERSTANDING
comprehending	AWARENESS OF UNDERSTANDING
confused	AWARENESS OF UNDERSTANDING
"I did not understand the questions."	AWARENESS OF UNDERSTANDING
"I didn't really remember what happened in the story and guessed on the formative."	AWARENESS OF UNDERSTANDING
"I earned a one because I was little confused and unsure about some of the answers."	AWARENESS OF UNDERSTANDING
"I got all five answers correct and feel like I know my stuff."	AWARENESS OF UNDERSTANDING
"I have a hard time understanding themes in poetry."	AWARENESS OF UNDERSTANDING
"I think I earned this score because I didn't really understand the concept of the formative."	AWARENESS OF UNDERSTANDING
"Just need to better understand what tone means."	AWARENESS OF UNDERSTANDING
knowing what to say	AWARENESS OF UNDERSTANDING
learning	AWARENESS OF UNDERSTANDING
realizing	AWARENESS OF UNDERSTANDING
understanding	AWARENESS OF UNDERSTANDING
understanding themes	AWARENESS OF UNDERSTANDING
unsure	AWARENESS OF UNDERSTANDING
"you're making sure you understand it."	AWARENESS OF UNDERSTANDING
aware	KNOWING WHAT TO DO
knowing	KNOWING WHAT TO DO
"knowing that you need to retest would probably be the best thing. You can just go into the SMTS and look to see that you need to retest on those assignments."	KNOWING WHAT TO DO
"you know what you need to do."	KNOWING WHAT TO DO
"you know what you need to work on."	KNOWING WHAT TO DO

Figure 4.4. Codes to Self-awareness category

When I was reviewing the subcodes during qualitative analysis, I realized that a large chunk of my subcodes revealed students having self-awareness when it came to knowing what they needed to do in terms of their learning and classwork, knowing where they were in terms of understanding class content, and knowing how they were thinking during learning processes. An *In Vivo* code that exemplifies this was, *"you know what you need to work on,"* which was assigned the subcode of knowing what to do. For example, in the "Why do you think you earned this score?" section of the SMTS, Rowan reported that they "didn't really remember what happened in the story and guessed on the formative." This quote reveals that Rowan had self-awareness about their level of

understanding in that they were able to realize that they were lacking in their memory about the story ready in class. Additionally, Rowan showed self-awareness in how they were thinking during classwork when they said that they "guessed" on the questions on the formative assessment. Another student, Logan, reported in the "Why do you think you earned this score?" portion of the SMTS that they needed to "read more carefully." This response evidences Logan having a self-awareness of what they were lacking and could do better in their future learning. Because students were revealing these different types of self-awareness, the category, Self-awareness, was created.

Analysis of these codes revealed several important ideas about the data. The first of these was that students knew what they needed to do to improve their work in class. For example, the *In Vivo* code, *"I needed to read more carefully and try to connect more things and questions to the article with the answers"* was subcoded as metacognition because it evidenced a student thinking about their thought process when completing work. This code also revealed that this student was aware of strategies that they should use in order to do better on their coursework. Another idea that came from these subcodes was that students were exhibiting self-awareness of how to achieve their goals, which can be seen in the *In Vivo* code, *"You know what you need to work on."* Additionally, students were showing awareness of their level of understanding of course content, which can be seen in the *In Vivo* code, *"I have a hard time understanding themes in poetry."* Taken together, these ideas combined into the category of Self-awareness, as students were showing a self-awareness of actual learning processes and their level of content understanding. This category subsumed a total of 28 codes or three subcodes.

The second category, Reflection About Learning Strategies, came out of a combination of multiple subcodes: writing, test taking strategies, learning strategies, classwork strategies, collaborating, and teaching SRL strategies (see Figure 4.5).

writing notes	WRITING
writing quotes down	WRITING
eliminating answers	TEST TAKING STRATEGIES
going with gut	TEST TAKING STRATEGIES
going to a different room	LEARNING STRATEGIES
"I can take my time more on the questions."	LEARNING STRATEGIES
using the text	CLASSWORK STRATEGIES
using time	CLASSWORK STRATEGIES
"I think I earned this score because me and my book club partner worked together to make sure the slide show was good."	COLLABORATING
involving others	COLLABORATING
"I feel like between the first day and the blended learning we could learn more about what you did wrong."	TEACHING SRL STRATEGIES
"Practice this skill more and use different strategies to help me understand it better."	TEACHING SRL STRATEGIES

Figure 4.5. Codes to Reflection About Learning Strategies category

When analyzing the qualitative data, I realized that students were reporting using and thinking about various types of learning strategies. For example, the *Process* code, *going to a different room*, was placed into the learning strategies subcode because of how it captured a student taking the action to go to a different room to achieve their learning goals. When subcoding had been completed and I was reviewing all of the subcodes together, I saw that many of my subcodes directly connected to learning strategies, such as collaborating and test taking strategies. I saw how students were referencing various learning strategies that they had used and planned to use in the future, which prompted me to create the category, Reflection About Learning Strategies. For example, Blake commented in a focus group interview, “Before you take your blended learning you have to review your notes.” This quote revealed that Blake had begun to knowingly use a learning strategy, reviewing notes, when engaging with blended learning. It is also

important to note in this quote from Blake the wording of "you have to review your notes." This illustrates that some function of the blended learning intervention time made Blake feel like reviewing notes was a non-negotiable learning strategy that should be used during the blended learning process, even though there was no penalty for students if they did not review their notes or any system for me to monitor whether students were reviewing their notes or not. Another student, Riley, wrote in the "Next Steps" portion of the SMTS that they could "time [their] time more on the questions." In this response, Riley exhibited that they were reflecting on a learning strategy (slowing down on test questions) that they could use in the future to be more successful on multiple choice question assignments.

The combination of these various subcodes revealed important aspects about the data: what learning strategies students were employing when learning material; how students were going about producing quality work; how students were planning to use learning strategies in the future; an awareness of strategies to pull from; and a desire to learn more concrete learning strategies to use. For example, the *Process* codes, *writing notes, adding evidence,* and *eliminating answers* showed that students were aware of and were using specific learning strategies during class time. At the same time, the *In Vivo* code, *"I feel like between the first day and the blended learning we could learn more about what you did wrong"* showed that students might be missing some direct instruction on specific learning strategies that they could be using to reflect on their work and improve their score. This category subsumed a total of 129 codes or six subcodes.

The third category, Value of SMTS as a Tracking and Monitoring Tool, came out of a combination of two subcodes: progress tracking and visual progress monitoring (see

Figure 4.6). When looking over the subcodes and the codes that went into their construction, I realized that students were voicing primarily positive sentiments about the SMTS and how it helped them to track and monitor their progress in class. In reviewing the subcodes during the category creation stage of qualitative analysis, the two subcodes of progress tracking and visual progress monitoring stood out as being very related to each other in their commentary on the usefulness of the SMTS as a tracking and monitoring tool, although one of the subcodes was more general and one specifically highlighted the visual aspect of the SMTS. Because of this relationship, I decided to create the category Value of SMTS as a Tracking and Monitoring Tool.

For the exception of one code *(tracking*), the codes that funneled into this category were all *In Vivo* codes that expressed students' satisfaction with the SMTS as a way to track and monitor their progress in class. For example, Blake reported in a focus group interview that "It's a good way to track all your assignments and your work." Additionally, the color-coding aspect of the SMTS was something that students focused on, such as in this *In Vivo* code, *"I think it's a great way to like visually see how you've been doing and how you've progressed."* This category subsumed a total of seven codes or two subcodes. The importance of these seven codes in the overall analysis stood out in peer debriefing as not needing to be consumed into another category.

"I love the colors."	PROGESS TRACKING
"I really like the SMTS because it's really easy for me to see."	PROGESS TRACKING
"I think it's nice because it's a lot easier to look at than Infinite Campus."	PROGESS TRACKING
"I think it's a great way to like visually see how you've been doing and how you've progressed."	VISUAL PROGRESS MONITORING
"Infinite Campus confuses me, but I like [the SMTS] because you automatically see where you started and where you ended up."	VISUAL PROGRESS MONITORING
"it's a good way to track all your assignments and your work."	VISUAL PROGRESS MONITORING
tracking	VISUAL PROGRESS MONITORING

Figure 4.6. Codes to Value of SMTS as a Tracking and Monitoring Tool category

The fourth category, Self-efficacy and Awareness of Needing Help, came out of two subcodes: help seeking and self-efficacy (see Figure 4.7). I noticed that students were not only becoming more aware of their ability to complete a task, but that they were asking for help if they did not feel able to complete a given task. For example, a *Process* code of *asking questions* was assigned to the help seeking subcode because of the way in which the student was actively seeking help by asking questions. As I was reviewing the subcodes, it became apparent to me that students' self-efficacy was related to their help-seeking habits. This relationship is evidenced by an entry in Hayden's SMTS document. In this entry, Hayden reported in the "Why do you think you earned this score?" section of the SMTS that they earned a poor score on the initial assessment because they "didn't really understand the concept of the formative" In this same entry but in the "Next Steps" portion of the SMTS, Hayden noted that next time around they should "ask more questions when [they] don't fully understand the assignment. Because of the way in which I saw students communicating a level of understanding of their self-efficacy, and then linking this to appropriate help-seeking, I created the category Self-efficacy and Awareness of Needing Help.

Analysis of these codes and subcodes revealed that students were exhibiting confidence in their ability to complete tasks and to improve their scores, but that they were aware of when they needed to ask for help. For example, Ash reported in the "Next Steps" portion of their SMTS document that they needed to "Ask the teacher about it and ask to reword it to me" in order to get a better score on the reassessment activity. This category subsumed a total of seven codes or two subcodes. The importance of these

seven codes in the overall analysis stood out in peer debriefing as not needing to be consumed into another category.

second guessing	SELF-EFFICACY
confident	SELF-EFFICACY
self-assured	SELF-EFFICACY
sure	SELF-EFFICACY
"Ask the teacher about it and ask to reword it to me."	HELP SEEKING
asking questions	HELP SEEKING
"asking the teacher."	HELP SEEKING

Figure 4.7. Codes to Self-efficacy and Awareness of Needing Help category

The fifth category, SMTS as an Assistive Tool in Recognizing Accomplishments, was generated from the sole subcode: feeling accomplished (see Figure 4.8). It became clear that students saw the SMTS as a way for them to record their progress and felt a resulting sense of accomplishment. For example, the *In vivo* code, "*You feel accomplished,"* was assigned this subcode because of how it demonstrated a student feeling accomplished about something they did in class. This code was also coded as an *Emotion* code, in that it expressed a student feeling a sense of accomplishment. As I was reviewing the subcodes, the feeling accomplished subcode stood out to me as being unique. While many of the other subcodes had relationships with others and thus could be combined to create a category, this subcode seemed to display a unique intersection between students' emotional response (feelings of accomplishment) to using the SMTS. Because of this, I opted to carry this sole subcode into the category of SMTS as an Assistive Tool in Recognizing Accomplishments.

Each of the codes that comprised the subcode of feeling accomplished was in reference to using the SMTS and exhibited that something about using the SMTS helped the student feel accomplished, which seemed to come from the shift of recording grades

from a passive activity on the part of students to an active activity that students controlled. For example, showing the shift of recording grades to something that the student has an active role in, an *In Vivo* code was generated from what Blake shared during the focus group interview *"You actually feel like you've changed something today."* Because of this function, the SMTS becomes a tool by which students can see and recognize their accomplishments and progress in class. This category subsumed a total of six codes. The importance of these six codes that were generated in producing the one subcode, *feeling accomplished*, stood out in peer debriefing as not needing to be consumed into another subcode or category.

accomplished	FEELING ACCOMPLISHED
accomplishing	FEELING ACCOMPLISHED
checking off	FEELING ACCOMPLISHED
"It's like checking something off your to-do list."	FEELING ACCOMPLISHED
"You actually feel like you've changed something today."	FEELING ACCOMPLISHED
"You feel accomplished."	FEELING ACCOMPLISHED

Figure 4.8. Codes to SMTS as an Assistive Tool in Recognizing Accomplishments category

The sixth category, Opportunity to Improve Academically, arose from the sole subcode: academic improvement (see Figure 4.9). After implementing the intervention in my class, students were taking advantage of the opportunities to improve their scores in class. For example, the *Process* code, *extending,* was assigned into the subcode due to its reference to extending to a higher score. When reviewing the subcodes, I realized that many of the codes from my qualitative data had been subcoded as academic improvement. In the codes that went into the construction of the academic improvement subcode, students were evidencing both academic improvement when they did not do well the first time and academic improvement to extend beyond grade level expectations.

advancing	ACADEMIC IMPROVEMENT
changing	ACADEMIC IMPROVEMENT
extending	ACADEMIC IMPROVEMENT
getting better	ACADEMIC IMPROVEMENT
getting comfortable	ACADEMIC IMPROVEMENT
"going above and beyond."	ACADEMIC IMPROVEMENT
improving	ACADEMIC IMPROVEMENT
"it's a good way to redo your work."	ACADEMIC IMPROVEMENT
"learn how to do it better."	ACADEMIC IMPROVEMENT
"Not a lot of teachers give the option for a four. I like how we get the option for a four every time."	ACADEMIC IMPROVEMENT
overachieving	ACADEMIC IMPROVEMENT
reassessing	ACADEMIC IMPROVEMENT
redoing	ACADEMIC IMPROVEMENT
retaking	ACADEMIC IMPROVEMENT
retesting	ACADEMIC IMPROVEMENT
upgrading	ACADEMIC IMPROVEMENT
"we get the opportunity to improve our score."	ACADEMIC IMPROVEMENT

Figure 4.9. Codes to Opportunity to Improve Academically category

For example, in a focus group interview, Avery noted that blended learning made it possible for them to go "above and beyond." This quote shows the way in which students felt that they had opportunities to go above grade-level expectations in my class as a result of the intervention used in this study. On the other end of the spectrum, Sasha noted that blended learning offered them "a good way to redo [their] work." This quote shows that students also felt they had an opportunity to improve academically if they did not do well initially. Because the action of academic improvement was so central to my study, in that I wanted to influence students to reassess and extend on their work in class in order to improve academically, I opted to carry this sole subcode into the category of Opportunity to Improve Academically.

From these codes, several ideas emerged, including: students recognizing their need to reassess or extend, students appreciating the opportunity to improve their scores in class, and the understanding of learning as a process rather than being complete after the awarding of a score. For example, an *In Vivo* code was generated from Harper having

offered an SMTS open-ended question response "*We get the opportunity to improve our score,*" which aligns with the idea of blended learning providing students with the chance to improve their grades in class. Additionally, several different *Process* codes, for example, *advancing, changing,* and *getting better* pointed to the students having shifted from seeing grades as the "end" of their learning to instead seeing grading as another portion of their learning process. This category subsumed a total of 17 codes or the one subcode.

The seventh category, Blended Learning Time Reducing Stress About Grades, came out of the sole subcode: stress level (see Figure 4.10). As students got into the swing of the intervention, they were able to relax a little bit about their grades, as they came to understand that they would have a chance to improve their grades. For example, the *In Vivo* code, *"When you're going for a 4 it's like more fun and relaxing,"* was assigned to this subcode because of the way it mentioned a lack of stress around extending to a higher score. This code was also coded as an *Emotion* code of *relaxed*, as the student was communicating the feeling of being relaxed during the blended learning activity. As I was reviewing subcodes, I noticed that I had a large number of codes that comprised the stress level subcode. Of these codes, the majority of them were a commentary on how students felt less stress as a result of the intervention used in this study. In a focus group interview, Alex noted that for them, because of blended learning time, "There's not as much stress." This seemed to be a unique feature of blended learning time, so I decided to carry the sole subcode of stress level into the category of Blended Learning Time Reducing Stress About Grades.

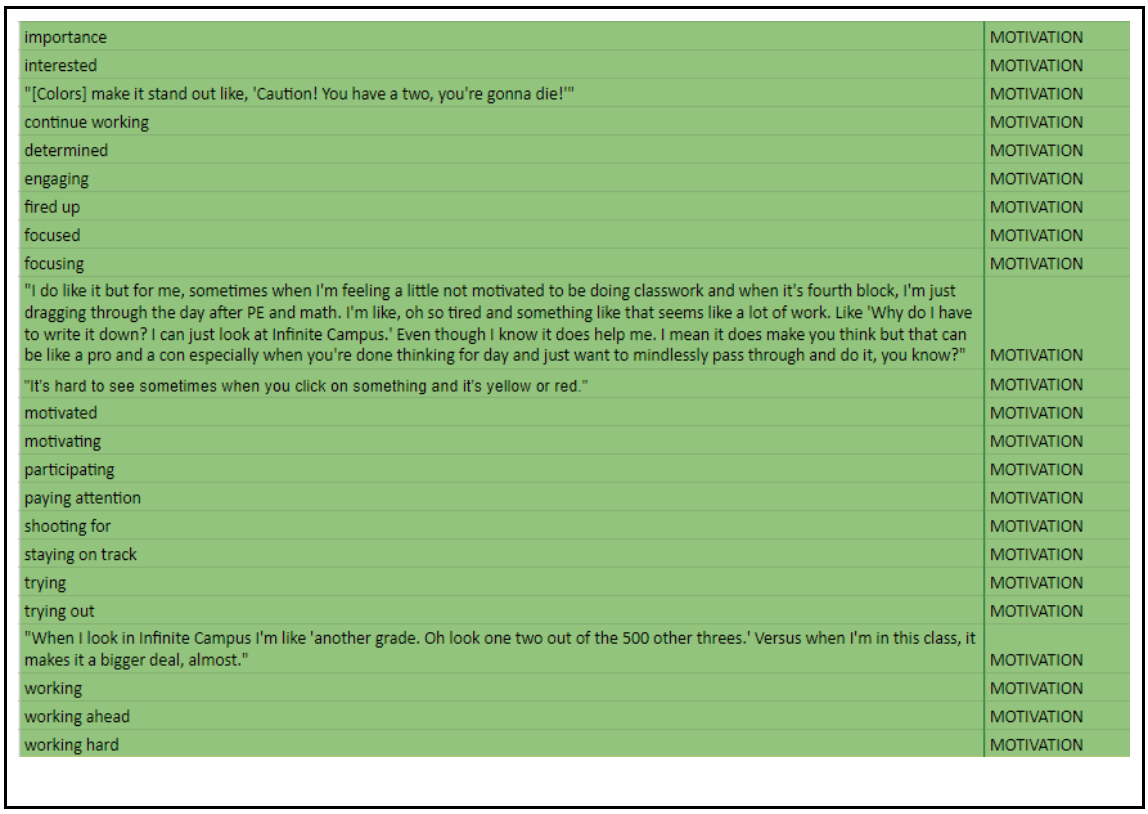
anxiety	STRESS LEVEL
anxious	STRESS LEVEL
calm	STRESS LEVEL
ease	STRESS LEVEL
"it also doesn't give you like the anxiety of, 'Oh, no. I'm gonna get a two. And there's nothing I can do to fix it.' It's like, there is a way to fix it. You don't have to worry."	STRESS LEVEL
nervous	STRESS LEVEL
relaxed	STRESS LEVEL
stressed	STRESS LEVEL
stressful	STRESS LEVEL
stressing	STRESS LEVEL
"there's not as much stress."	STRESS LEVEL
"When I'm retesting for a three, it's pretty stressful to be honest."	STRESS LEVEL
"when you're going for a 4 it's like more fun and relaxing."	STRESS LEVEL
worried	STRESS LEVEL
worrying	STRESS LEVEL

Figure 4.10. Codes to Blended Learning Time Reducing Stress About Grades category

These codes pointed towards the idea that blended learning was a stress reliever for many students because of the opportunity in class for them to reassess during the blended learning time. At the same time, students exhibited nervousness or anxiety about recording a score below a three in their SMTS and feeling that pressure during the blended learning time. For students who initially earned a score of a three and were extending to a four during the blended learning time, this stress seemed to dissipate, as evidenced in the *In Vivo* code generated from Alex's response during a focus group interview, *"When you're going for a 4 it's like more fun or relaxing."* This category subsumed a total of 15 codes or the one subcode.

The eighth category, Students Being Motivated to Improve Their Scores, came out of the sole subcode: motivation (see Figure 4.11). In addition to students having lower stress about their grades, I also noticed that they were more engaged in the grading process and displayed a higher level of motivation when it came to doing the work to improve their scores. For example, the *Emotion* code, *motivated* was generated from

Riley's response in a focus group interview that mentioned that the SMTS "motivated [them] or fired [them] up to do better. When reviewing subcodes, I noticed that the subcode of motivation comprised a significant portion of the qualitative codes.



importance	MOTIVATION
interested	MOTIVATION
"[Colors] make it stand out like, 'Caution! You have a two, you're gonna die!'"	MOTIVATION
continue working	MOTIVATION
determined	MOTIVATION
engaging	MOTIVATION
fired up	MOTIVATION
focused	MOTIVATION
focusing	MOTIVATION
"I do like it but for me, sometimes when I'm feeling a little not motivated to be doing classwork and when it's fourth block, I'm just dragging through the day after PE and math. I'm like, oh so tired and something like that seems like a lot of work. Like 'Why do I have to write it down? I can just look at Infinite Campus.' Even though I know it does help me. I mean it does make you think but that can be like a pro and a con especially when you're done thinking for day and just want to mindlessly pass through and do it, you know?"	MOTIVATION
"It's hard to see sometimes when you click on something and it's yellow or red."	MOTIVATION
motivated	MOTIVATION
motivating	MOTIVATION
participating	MOTIVATION
paying attention	MOTIVATION
shooting for	MOTIVATION
staying on track	MOTIVATION
trying	MOTIVATION
trying out	MOTIVATION
"When I look in Infinite Campus I'm like 'another grade. Oh look one two out of the 500 other threes.' Versus when I'm in this class, it makes it a bigger deal, almost."	MOTIVATION
working	MOTIVATION
working ahead	MOTIVATION
working hard	MOTIVATION

Figure 4.11. Codes to Students Being Motivated to Improve Their Scores category

Of these codes, most of them dealt with the motivation that students felt to either attain high scores in my class or to work to achieve a high score if they did not initially. Because this study sought to investigate how the intervention would impact students' academic performance, I thought that this subcode was a good way to capture the motivation that students felt in order to perform at high academic levels. Because of this, I decided to carry this sole subcode into the category of Students Being Motivated to Improve Their Scores.

Analysis of these codes revealed that using the SMTS was a big motivator for students to apply themselves in class and change their existing score during the blended

learning time. *Process* codes such as *trying, staying on track,* and *working hard* evidenced students being motivated to do well in class. Additionally, Devon reported in a focus group interview response, which was coded through *In Vivo* coding "*When I look in [the district grading system] I'm like 'Another grade. Oh look one 2 out of the 500 other 3's.' Versus when I'm in this class, it makes it a bigger deal, almost*." This revealed the way in which the SMTS shifted the grading process from being a passive activity for students to being something that they were directly involved in and thus were more motivated to perform in class. This category subsumed a total of 23 codes and the one subcode.

The ninth and final category, Reflection Produced Ownership and Agency of the Learning Process, was born out of the combination of two subcodes: reflecting, and practicing and reviewing (see Figure 4.12). During the intervention, students were able to take more ownership of their learning in that they had the ability to complete blended learning activities and raise their scores. They also exhibited ownership of their learning by recording their progress in the SMTS and choosing their next steps for future learning. Together, this gave students more power and agency in the learning process. \

When I began examining subcodes, I realized that the subcodes of reflecting, and of practicing and reviewing were different in their meaning from subcodes such as the learning strategies subcode or the classwork strategies subcode that were subsumed by the Reflection About Learning Strategies category. While these subcodes focused more specifically on students using and reflecting on the strategies that they were using in class, I saw something different in the codes that were assigned the subcode of reflecting and of practicing and reviewing. In these codes, there was an element of ownership and

agency that made these two subcodes stand apart. For example, Taylor and Riley provided insights through the following quotes.

Taylor: "[The SMTS gave me a chance to] actually think about the future and this year, what we can do." (Focus Group Interview)

Riley: "I looked at my notes and we did some practice right before so I felt more confident." (SMTS Open-ended Response)

In Taylor's quote, they revealed their ability to reflect, but also to take ownership of this reflection by carrying it with them into the future and subsequent school years. Additionally, Riley comment is showing evidence of practicing and reviewing. Specifically, their addition of, "I felt more confident" shows that additional piece of ownership of learning. For this reason, the subcodes of reflecting and of practicing and reviewing were put in the category of Reflection Produced Ownership and Agency of the Learning Process.

"I looked at my notes and we also did some practice right before so I felt more confident."	PRACTICING AND REVIEWING
looking back at article	PRACTICING AND REVIEWING
looking back at notes	PRACTICING AND REVIEWING
looking back at text	PRACTICING AND REVIEWING
looking back at the story	PRACTICING AND REVIEWING
rereading	PRACTICING AND REVIEWING
reviewing	PRACTICING AND REVIEWING
"During the SMTS, at the end of it, you say what you did that helped you and then what you could do next time that would help you. I think that helps me a lot."	REFLECTING
"I like how it says, you can tell yourself how confident you are in that thing. So during that thing like it's reading informational text. I said, I'm not too confident with that. Then I can be like, 'Oh, okay, you could look back at it and you could start studying more for informational text, this is the area in class that I'm not super strong.'"	REFLECTING
"it helps me figure out what I did wrong."	REFLECTING
looking back	REFLECTING
"On the part where it's like, 'What can I do next time?' It's really helpful because a lot of times when grades come in, you see it, and you're like, 'Oh great, I'm done with that now until next year when I'm going to review it.' But it gives us a chance to actually think about the future and this year, what we can do."	REFLECTING
reflecting	REFLECTING
reflective	REFLECTING

Figure 4.12. Codes to Reflection Produced Ownership and Agency of the Learning Process category

From these codes, several ideas emerged from the analysis, including: students were forced to reflect when using the SMTS, and as a result started to incorporate

practicing and reviewing into their class activities; students were starting to take ownership of mistakes and were coming up with methods to correct these mistakes; the learning process via reflection was becoming something that students were more in control of. For example, the *Process* code of *reflecting* and the emotion code of *reflective* pointed to students incorporating reflection into their learning process. *Process* codes such as *looking back at notes* and *reviewing* pointed to students taking action based upon their reflection. This category subsumed a total of 16 codes or the one subcode.

Theme Development

During the second cycle of coding, I used *Pattern Coding*. This coding process involved further examining the nine categories by comparing the data to identify patterns and explanations (Saldaña, 2016). Generating themes comes as a result of coding and categorizing qualitative data and is a rigorous process which "requires comparable reflection on participant meanings and outcomes" (Saldaña, 2016, p. 200). To visualize the process of creating themes, I made a copy of my final categories and moved them around on an Excel sheet to try to see how the categories fit together into themes. Peer debriefing was utilized with one of my dissertation chairs to support and document my decisions. From these processes, three themes emerged from the data: (a) Students increased their ownership of learning through self-awareness of successful learning strategies and independence; (b) The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress; and (c) The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished. A description of each of these themes with supportive rich, thick

descriptions is discussed in the following sections. See Appendix I for a transparent description of how thinking evolved into themes.

Theme 1: Students increased their ownership of learning through self-awareness of successful learning strategies and independence. After reflecting on the coding, subcoding, and categorization process, I saw that many of my categories and the ideas behind them were connected into this larger theme. This theme subsumed four out of nine categories. In this section, I will further discuss these subsumed categories: (a) Self-awareness, (b) Reflection about Learning Strategies, (c) Reflection Produced Ownership and Agency of the Learning Process, and (d) Self-efficacy and Awareness of Needing Help (see Figure 4.13). What I realized upon this reflection is that the Reflection Produced Ownership and Agency of the Learning Process category was made possible by the remaining categories that were subsumed. For example, when Riley wrote in the "Why do you think you earned this score?" section of the SMTS that, "I looked at my notes and we did some practice right before so I felt more confident," it became evident to me that Riley's confidence and subsequent ownership of their learning was made possible by their use of two learning strategies: reviewing notes and practicing. Another student, Alex, said in a focus group interview that, "I could go home and study that night and then go back and retest." Because Alex had a self-awareness of their need to study and used a learning strategy on their own, they were taking a much more active role in their learning.

When I examined the codes and subcodes in each category more closely, some common ideas began to emerge. From the students' SMTS open-ended question responses and from the focus groups interviews, students were revealing that they

developed a sense of ownership over their learning. This ownership seemed to be connected to students' self-efficacy, as well as their awareness of learning strategies at their disposal and their knowledge of when to ask for help.

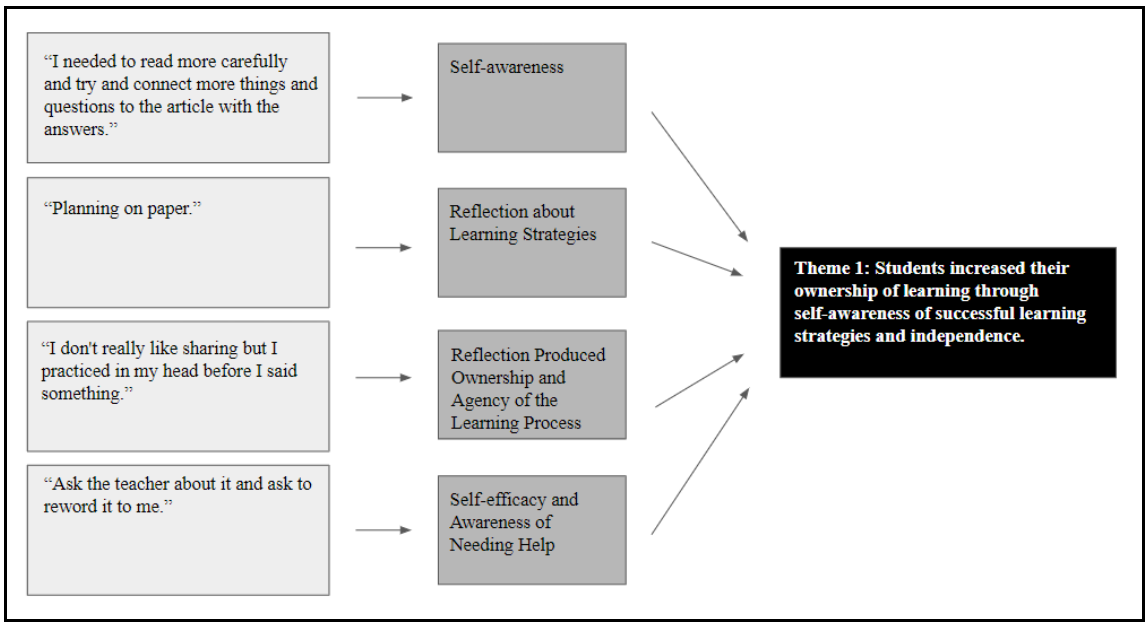


Figure 4.13. Theme 1 development

Self-awareness. A crucial part of the learning process is students' self-awareness. In order to be successful, students needed to be aware of the mistakes that they made and also needed to be aware of how to go about correcting those mistakes. This was something that students were able to engage in via their use of the SMTS. Successful self-regulated learners need to have what is called "self-knowledge," which is defined as being aware of one's own strengths and weaknesses, accurately judging content mastery, and having an understanding of which learning strategies will work well for them for a specific task (Nilson, 2013). Wrapped up in this is students' knowledge of the learning processes that they are currently using and understanding how well those processes and strategies are working for them. For example, in Logan's SMTS open-ended question response, they reported that "I needed to read more carefully and try and connect more

things and questions to the article with the answers," showing a level of self-awareness of the learning strategies or lack of learning strategies that may have resulted in poor performance. Additionally, Parker reported in a focus group interview that "I have a hard time understanding themes in poetry," reflecting an awareness of certain content deficiencies in class. Because students were exhibiting a self-awareness of their own abilities in addition to how they were currently or should be employing different learning strategies, this category was subsumed into theme one: Students increased their ownership of learning through self-awareness of successful learning strategies and independence.

Reflection about learning strategies. While it was important for students to be aware of what they were doing well and what they were not doing well, they also needed to have a grasp of different learning strategies that they could use to learn effectively and complete classwork. Being aware of learning strategies that are effective versus ineffective learning strategies helps students to perform better in class (Karpicke, Butler, & Roediger, 2009). In Quinn's SMTS open-ended question response, they reported that their next step in regard to a vocabulary assignment was "Working on using these words when speaking so I understand them better and remember them." This statement revealed that Quinn was aware of a certain learning strategy (using vocabulary words in speech) and how to use it to their advantage for classwork. Another student, Riley, noted in their SMTS document that they were successful on a specific assignment because they engaged in "planning on paper," also illustrating a student understanding different learning strategies at their disposal and evaluating their effectiveness. Because students were showing an awareness of learning strategies to use and an ability to reflect on how

those learning strategies served them, this category was subsumed into theme one: Students increased their ownership of learning through self-awareness of successful learning strategies and independence.

Reflection produced ownership and agency of the learning process. When students can effectively reflect on their learning, they also become more active in the learning process and can take more ownership of their learning (Chan, Graham-Day, Ressa, Peters, & Konrad, 2014). By engaging in reflection via the SMTS and taking control of their progress in class via blended learning, the students in this study gained ownership and agency of the learning process. Furthermore, students being able to evaluate and clarify additional learning needs that they may have is an important piece of taking ownership in their learning. In a focus group interview, Sasha said of the SMTS that "I like how it says, you can tell yourself how confident you are in that thing. So during that thing like it's reading informational text. I said, I'm not too confident with that." Adding on to this, Sasha reported that using the SMTS helped them to "look back at it and you could start studying more for informational text, this is the area in class that I'm not super strong." In these statements, Sasha revealed reflection on how their strengths and weaknesses in class gave them a sense of control over how they would proceed. Another student, Hayden, reported in their SMTS open-ended question response that "I don't really like sharing but I practiced in my head before I said something," showing a student reflecting on their preparation process (practicing in their head) which enabled them to be more confident in a class discussion and feel more in control of their performance in class. Because of the way in which students could reflect on their current practices as well as what they needed to do moving forward, they were able to take more

control of their learning process and thus this category was subsumed into theme one: Students increased their ownership of learning through self-awareness of successful learning strategies and independence.

Self-efficacy and awareness of needing help. As students began to take more ownership of their learning process, they needed to have a certain level of self-efficacy, or confidence in their ability to complete tasks. In addition to this, students also needed to understand when they were not able to complete a task independently and seek out help as needed. Although the concepts of self-efficacy and help-seeking may seem at odds with one another, this is actually not the case. Students with effective help-seeking strategies have been shown to become less reliant on others and more confident in their own ability to complete tasks (Pintrich, 2000; Schunk & Ertmer, 2005; Winne, 1996). In a student's SMTS open-ended question response where they noted their next steps after taking an assessment, Ash stated that they needed to "Ask the teacher about it and ask to reword it to me." This statement reveals that the student understood a limitation that they faced: they did not understand the way a question or assignment was worded. However, this statement also reveals a certain level of self-efficacy that the student had, as they seemed to be communicating that once the teacher reworded the question to them, they would be able to proceed independently. Because of the way in which self-efficacy combined with help-seeking behaviors helped to make students more independent in their learning, this category was subsumed into theme one: Students increased their ownership of learning through self-awareness of successful learning strategies and independence.

Theme 2: The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less

stress. As I continued to analyze the codes, subcodes, and categories that I had created, the concepts of motivation, academic improvement, and student stress levels began to emerge in connection with students' use of the SMTS and their participation in the blended learning time. What I primarily noticed was that not only were students improving their grades, but they were motivated to do so and did not feel overly stressed by this aspect of my class. For example, Avery stated in a focus group interview that, "I just like [blended learning] because you don't just have to move up one grade. I can go from a two to four or a one to a four." This quote shows Avery's motivation to improve their grades, as they desired not to just move up to the proficient score of three, but to continue to extend to a four. This quote also captures the ability that Avery had to improve academically by improving their score in class. Finally, in this quote, Avery seems to be communicating in a positive or excited manner about improving their score, which signaled to me that they were not stressed by this aspect of the intervention. Because of this, I found it appropriate to create this theme by subsuming three out of nine categories: (a) Opportunity to Improve Academically, (b) Students Being Motivated to Improve their Scores, and (c) Blended Learning Time Reducing Students' Stress about Grades (see Figure 4.14), which will be discussed in this section.

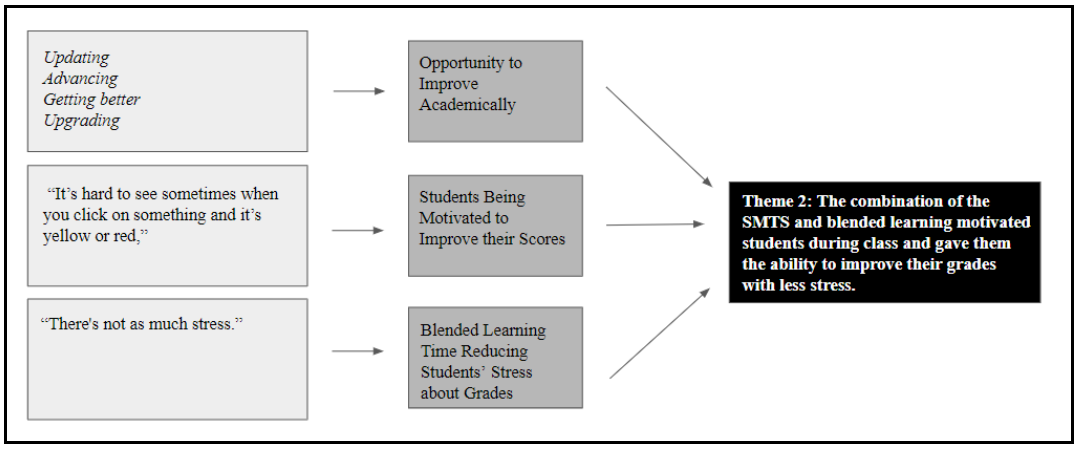


Figure 4.14. Theme 2 development

Opportunity to improve academically. One of the foundations of the intervention used in this study was taken from the mastery learning approach. In mastery learning, students are given multiple opportunities to reach mastery on the assignments given in a class (Anderson 1976; Bloom, 1971; Caroll 1963; Ee et al., 2018; Morphew et al., 2020; Palardy, 1987; Slavin, 1987). The blended learning intervention time used in this intervention served to provide such opportunity for students' academic improvement. By giving students the time in class and the necessary materials to improve their scores in my class, the concept of grades shifted a bit from the end of the process to part of the learning process. This idea is in line with Brookhart's (2012) conception of grading as a learning tool rather than an end to the learning process. Several *process* codes revealed this idea of movement and improvement, including: *updating, advancing, getting better,* and *upgrading*. From these codes, one can see that the opportunity to improve academically was a motivator for students to continue working until mastery had been attained. Additionally, giving students the option to extend above grade-level expectations by attaining a score of a 4 seemed to be a source of motivation as well. In a focus group interview, Sam commented that "Not a lot of teachers give the option for a four. I like how we get the option for a four every time." This student appreciated the opportunity in class to go above and beyond, and was thus more motivated than they might have been if that opportunity for academic improvement was not there. Because giving students the opportunity to improve academically seemed to change their relationship with grading to being more positive, and this opportunity seemed to motivate them to perform well in class, this category was subsumed into theme two: The

combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress.

Students being motivated to improve their scores. In addition to students being given the opportunity to improve academically, they also needed a certain level of motivation in order to actually achieve this improvement. As I discussed with one of my dissertation chairs during the peer review process, in order for students to be successful during this intervention, they needed both the motive and the means to achieve academic success. A large influence on student motivation is their level of autonomy, which has been shown to positively correlate with motivation (Garcia & Pintrich, 1996). By giving students more ownership of the grading process via the SMTS, and more independence via the blended learning intervention time, students did experience autonomy during the intervention used in this study. In several *process* codes, students exhibited this sense of motivation to improve their scores, including: *focusing, staying on track,* and *working hard*. These codes revealed that students had the necessary motivation to dedicate their focus to the task at hand and expend enough effort to complete it. Additionally, the SMTS seemed to motivate students to improve their scores. In a focus group interview, Devon said of the SMTS that "When I look in [the school district grading system] I'm like 'another grade. Oh look one two out of the 500 other threes.' Versus when I'm in this class, it makes it a bigger deal, almost." For Devon, the SMTS had made receiving a grade a "bigger deal," which is something that would have motivated them to put forth effort during the subsequent blended learning time. Additionally, the color-coding aspect of the SMTS seemed to motivate some students. For example, Blake reported in a focus group interview that "It's hard to see sometimes when you click on something and it's

yellow or red," referring to the SMTS functionality that automatically colored scores of a 1 to red and scores of a 2 to yellow. For this student, having to visually see the yellow or red seemed to be a motivator to improve their score to be able to change the color to green, signifying a score of a 3, or even blue, signifying a score of a 4. Because of the way in which students felt motivated to do well in class and thus improve their scores, this category was subsumed into theme two: The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress.

Blended learning time reducing students' stress about grades. School grading systems can be a source of anxiety for students (Ziedner, 2014). However, while a certain level of stress or anxiety might be motivating for some students, higher levels of test anxiety have been shown to correlate with lower grades (Barrows, Dunn, & Lloyd, 2013). To combat this, many educational institutions have shifted their grading philosophy to mastery grading or pass-fail grading, both of which have been shown to lower students' anxiety about grades and foster a more collaborative learning environment (Ee et al., 2018; White & Fantone, 2010). The intervention used in this study incorporated aspects of mastery learning and pass-fail grading, in that students needed to achieve mastery (a score of a 3) in order to complete the extension activity. Otherwise, students would complete the reassessment activity in order to earn a "passing" score for that specific assignment. Because of this, students' stress and anxiety level regarding grades did seem to lessen over the course of the intervention. In a focus group interview, Alex reported that as a result of blended learning time, "There's not as much stress." Students seemed to appreciate that if they did not do as well as they hoped on the first assessment, that they

would have a chance to correct that in class the following day. Another student, Devon, added that “There is a way to fix it. You don't have to worry.” However, students also illuminated the difference between reassessing to earn a 3 during blended learning and extending to earn a 4. In a focus group interview, Alex said that “When I'm retesting for a three, it's pretty stressful to be honest." Conversely, this same student added that “When you're going for a 4 it's like more fun and relaxing.” This revealed to me that while having the opportunity to reassess did generally lower students’ stress and anxiety about grades, they were still motivated enough by their final score to have a certain level of stress when completing the reassessment activity during blended learning. On the other hand, when students were completing the extension activity during the blended learning time to earn a 4, they were already secure in their 3 score, and could only go up from there, which seemed to reduce the stress of completing the activity. Because of the way in which blended learning time seemed to alleviate a certain amount of students’ stress and anxiety about grades without completely stripping them of their motivation to do well, this category was subsumed into theme two: The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress.

Theme 3: The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished. Upon further analysis of codes and categories, I began to see patterns of students reporting the SMTS to be a good tracking and monitoring tool as well as a good way to recognize their own accomplishments. This theme subsumed two out of nine categories. In this section, I will further discuss these subsumed categories: (a) SMTS as

an Assistive Tool in Recognizing Accomplishments, and (b) Value of SMTS as a Tracking and Monitoring Tool (see Figure 4.15).

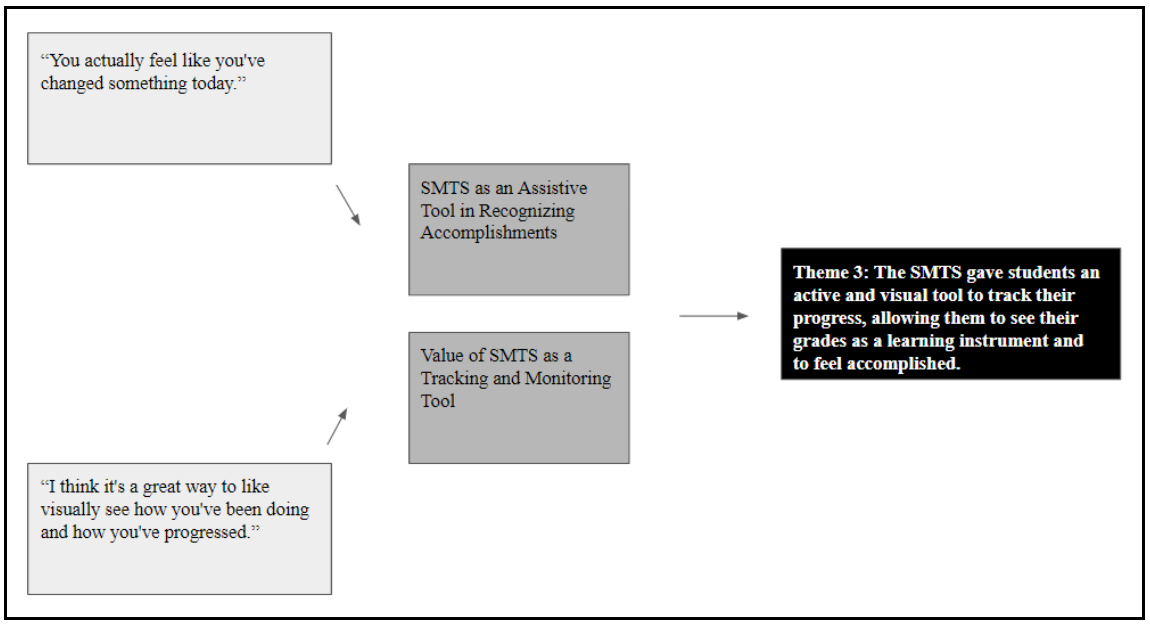


Figure 4.15. Theme 3 development

SMTS as an assistive tool in recognizing accomplishments. An important factor in motivation is the recognition of accomplishments (Koo & Fishbach, 2014). When people focus on what they have achieved, they are more likely to have a high level of motivation. Motivation is an important educational consideration for many reasons, but specifically because motivation plays a large role in facilitating students' SRL (Pintrich, 2000; Zimmerman, 2000). Additionally, motivation is positively correlated to academic achievement, whether it be intrinsic or extrinsic motivation (Ayub, 2010). In this study, students appreciated the opportunity to recognize their accomplishments via their use of the SMTS. In a focus group interview, Sam said of using the SMTS that "You feel accomplished." Another student, Blake, added, "You actually feel like you've changed something today," when discussing updating their scores in the SMTS. The specific wording "actually changed something today" seemed to reveal this student's sentiment

that their use of the SMTS made their time in class seem worthwhile. The ability to chart their progress and update their scores as they made progress in class seemed to help students recognize their own accomplishments in class, which seemed to be something they enjoyed about using the SMTS. These comments seemed to be made in a positive light, as they were both a response to the question: What was the best part about using the SMTS? Although students would still receive a grade and/or an updated grade if they successfully reassessed or extended, the added step of entering the initial grade or the updated grade seemed to help boost students' sense of accomplishment. Because of this function of the SMTS, this category was subsumed into theme three: The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished.

Value of SMTS as a tracking and monitoring tool. One of the intended purposes of the intervention used in this study was to assist students in tracking and monitoring their progress in class. Self-monitoring has been shown to help students make positive behavior changes in a school setting (Martin et al., 2003; Rafferty, 2010; Shimabukuro, 1999; Wood et al., 2002). Additionally, tracking academic performance has been shown to positively correlate with increased academic performance and SRL skills. Overall, in this study, students seemed satisfied with how the SMTS helped them to track and monitor their performance in class. An element of the SMTS that many students particularly appreciated was the visual representation of their progress through the embedded color-coding of the SMTS document. In a focus group interview, Taylor reported that "I think it's a great way to like visually see how you've been doing and how you've progressed." Another student, Alex, added that "[The school district grading

system] confuses me, but I like [the SMTS] because you automatically see where you started and where you ended up." For these students, the visual representation of their progress was much easier for them to understand and respond to than the non-visual representation that was offered by the district grading system. Even though students had another way to look at their progress through the district grading system, they were more amenable to using the SMTS because it afforded them with a better way to visualize their progress, which is why this category was subsumed into theme three: The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This chapter positions the findings of this study within the existing literature on the ways in which blended learning intervention time combined with use of the SMTS impacted students' SRL skills, academic performance, and learning experience. The purpose of this action research was to evaluate the effects of the implementation of weekly blended learning interventions combined with a self-monitoring achievement system on students' self-regulated learning skills and academic performance in an eighth-grade English language arts classroom at Branch Middle School.

The following research questions were addressed in this study:

1. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?
2. How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' performance on coursework at Branch Middle School?
3. How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?

Discussion

It is important to situate the findings of this action research study within the larger context of research on SRL and tracking and monitoring mechanisms. A gap exists between research conducted in the field of education and the practical applications that take place in classrooms. Because of this, adding the findings of this action research study to the broader field of educational research will assist in lessening that gap (Mertler, 2020). To answer the research questions, quantitative and qualitative data were combined and considered through the lenses of SRL growth, academic performance, and student experience. The discussion is organized by the research questions.

Research Question 1: How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade English language arts students' self-regulated learning skills at Branch Middle School?

For this research question, I wanted to know if providing students with blended learning intervention time, paired with their use of the SMTS, would improve their SRL skills. A review of the literature shows that blended learning environments can have a positive impact on student learning and achievement (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Ryan, Kaufman, Greenhouse, She, & Shi, 2016). In addition to increasing academic performance, blended learning has been shown to increase student satisfaction (Banerjee, 2011; Melton et al., 2009; Truitt & Ku, 2018). However, blended learning has been less heavily studied at the middle school level (Alexandre & Enslin, 2017; Jones, 2016; Prescott et al., 2018; Truitt & Ku, 2018). In the following sections, I

will discuss the ways in which the intervention used in this study impacted students' SRL skills in terms of (a) implementation impact and (b) SRL and ownership of learning.

Implementation impact. Overall, the implementation of the intervention used in this study did not have a measurable impact on students' SRL skills, as there was no statistically significant difference between the pre-test and post-test MSLQ scores. This was further supported by qualitative data showing a need for more explicit direction between students completing the initial assessment and then completing the blended learning on SRL strategies that they could be using to improve their learning experience. For example, two students shared in the focus group interviews:

Sam: "I feel like between the first day and the blended learning we could learn more about what you did wrong."

Devon: "[in the future have] a team of high schoolers look back and see what methods are actually effective."

Although students were using SRL skills such as reflection and planning by participating with the SMTS and engaging in the blended learning intervention time, it does not seem that these skills became a more permanent fixture for students. Aligned with previous research, this study showed that SRL skills do not transfer well to students without very explicit teaching of specific SRL strategies and concepts (Chamot, 2018; Kiewra, 2002; Pressley & Woloshyn, 1995). Previous research has shown that best practice for teaching SRL skills involves (a) introducing the SRL strategy by defining it and modeling it, (b) explaining why the strategy works, (c) explaining how the strategy can be useful in other contexts, and (d) providing opportunities for students to perfect the strategy via practice (Kiewra, 2002; Pressley & Woloshyn, 1995). Additionally, past studies have found that direct and explicit teaching of SRL skills and strategies is more successful in helping

students become self-regulative (Dignath & Büttner, 2018; Levy, 1996; Paris & Paris, 2001; Schunk & Ertmer, 2005). Because of how the intervention was constructed, students were using SRL strategies such as reflecting, planning for future learning, and selecting appropriate learning strategies. These strategies are all important elements of SRL (Broadbent et al., 2021; Zimmerman, 2000). During this intervention, the SRL strategy was introduced by defining and modeling it, and this provided opportunities for students to perfect the strategy via practice. However, this intervention may have been lacking in explaining why various SRL strategy work and explaining how those strategies could be useful in other contexts, which may have led to insignificant results for students SRL skills.

Self-regulated learning and ownership of learning. While the quantitative data analysis about the intervention used in this study did not show any significant change in students' SRL skills, it did point to growth in students' ownership of learning which was further supported in the qualitative data. For example, how a student was exhibiting a sense of self-awareness was seen in Avery's response: "I didn't really remember what happened in the story and guessed on the formative." In this response, Avery showed an awareness of a fault in their ability to remember the plot of the story, as well as an acknowledgement that their guessing on the formative assessment resulted in them receiving a low score. Self-knowledge, or the learner's ability to be aware of their own strengths and weaknesses, and subsequently select learning strategies that will enable them to be successful, is a critical part of well-developed SRL skills (Nilson, 2013). Additionally, when students filled out the "Next Steps" portion of their SMTS document, they were listing several strategies that they planned to use during the blended learning

time. For example, Alex noted that they “should also try using better elimination and giving better reasons on why the answers aren't correct.” This response shows that Alex knew of certain strategies to use (elimination of answers) and was prepared to put this strategy into practice in order to produce better results on the blended learning and subsequent assessment, which is an important aspect of SRL (Zimmerman, 2000).

The convergence of quantitative and qualitative data identified students' awareness of their own abilities as well as their knowledge of learning strategies that may work for them resulting in students having a greater level of ownership over their learning process. Without having to explicitly tell them why they received a certain score on an assessment, students were beginning to identify what they did or did not do in order to produce a certain score. This type of ownership of the learning process aligns with Pintrich and DeGroot’s (1990) definition of SRL in that students were beginning to monitor their cognition, and make adjustments to future learning without specific direction from the instructor. Students were also beginning to choose learning strategies for themselves rather than being given certain learning strategies by the teacher (Pintrich & DeGroot, 1990). While there was no evidence of a growth in students’ SRL skills as a result of the intervention used in the study, students were taking more ownership of their learning after using the weekly blended learning interventions combined with a self-monitoring achievement system, which is a significant component of well-developed SRL skills (Pintrich, 2000).

Research Question 2: How and in what ways does the implementation of blended learning, combined with a self-monitoring tracking system, impact eighth grade

English language arts students' performance on coursework at Branch Middle School?

For this research question, I wanted to know if the intervention used in this study had any effect on students' performance on coursework, which included their overall grades in the course, frequency of reassessment, frequency of extension, and number of missing assignments. For all of these variables, the intervention had a positive impact on students' academic performance and are further supported from the findings of the qualitative data. These results are aligned with existing literature (Alexandre & Enslin, 2017; Prescott et al., 2018; Li & Wang, 2022), as both portions of the intervention, including the blended learning intervention time and the SMTS were chosen because of their documented positive effect on student learning outcomes. Blended learning has been shown to have a positive impact on student achievement (Ryan, et al., 2016). Additionally, tracking and monitoring has been shown to be successful in changing behavior over time (Martin et al., 2003; Rafferty, 2010; Shimabukuro, 1999; Wood et al., 2002). In this study, students shifted their behavior in class to more frequently reassess and extend on assignments, which positively affected their academic performance. Tracking and monitoring have also been used to promote academic reflection (Zimmerman, 1998; Zimmerman, 2002; Marzano, 2007), which in this study, may have helped students to be more active in their learning and have better learning outcomes. Self-monitoring has been shown to have a positive relationship with academic achievement (Ghanizadeh, 2017). However, there is less literature documenting the effectiveness of tracking and monitoring in increasing students' academic achievement,

so the findings of this study can add to the existing literature on tracking and monitoring used for academic achievement.

Academic performance. In this study, academic performance referred to students' grades on assignments within my class and the students' academic performances increased from the pre-test to the post-test period. My school utilizes a grading system that scores students from 1 to 4, and 3 is considered "meets grade level expectations." Before applying the intervention, students' mean score in my class was below this threshold, and after applying the intervention, the mean score was above this threshold. This aligns with the existing literature on the positive relationship between blended learning and students' academic performance at the middle school level (Ceylan & Kesici, 2017), and with the existing literature on the positive relationship between self-monitoring and academic performance (Ghanizadeh, 2017).

This growth in academic performance could have been triggered by various aspects of the intervention. Blended learning intervention time was designed to give students more support on content or concepts that they did not fully understand the first time it was taught, or to give students the opportunity to extend their thinking to above grade level expectations (Fazal et al., 2020). This function of blended learning in this study could have caused higher overall academic performance because students with lower scores were getting more support, and subsequently higher scores. Additionally, students capable of scoring above grade level expectations had more opportunities to do so, which increased the frequency of students extending to a score of 4, meaning that students were extending themselves and earning the score of 4 more often after the intervention was applied. Put in different terms, almost all students extended to a score of

4 at least once during the intervention, compared to less than a third of students extending before the intervention. This finding is supported by Khachikian, Guillaume, and Pham (2011), who found that students with high grades tend to have little to no change in their grade over time, and students with low grades tend to have a decline in their grade over time. This reflects the idea that students do not always put in additional effort to earn higher grades unless they have a reason or motivation to do so. Alex noted the support that blended learning afforded them when they said in a focus group interview, "When I'm doing blended learning it helps me just realize how to get better and reflect on my mistakes." This comment was also implied by other students in showing how blended learning played a role in helping them relearn material in more effective ways.

The converged quantitative and qualitative data outcomes also showed that students' use of the SMTS resulted in a growth in their academic performance as a result of the reflective questions built into the SMTS tool. One of the intentions of using the SMTS was to help students reflect on their use of learning strategies and make more informed decisions about what to do next in their learning journey. The SMTS was specifically designed to promote reflection because student reflection is a core element of many SRL models (Panadero, 2017; Pintrich, 2000, Zimmerman, 2000) This process was encouraged by the "Why do you think you earned this score" and the "Next Steps" portions of the SMTS. When reflecting on why they earned a score in their SMTS, Parker wrote that they "just need[ed] to better understand what tone means." This quote showed that Parker had an awareness of the knowledge that they were lacking, which may have given them a more concrete way to move forward before engaging with the blended learning and taking a new assessment. This idea also came through in Sasha's focus

group interview response when they commented on the aspect of the SMTS that asked students to rate their confidence with a certain ELO. Sasha identified her confidence with the “Reading Informational Text” ELO, saying, "I like how…you can tell yourself how confident you are…you could look back at it and start studying more…this is the area in class that I'm not super strong.” This also evidences a student having awareness of what knowledge they were lacking and giving them a clearer path for relearning and moving forward.

Another important function that the SMTS served in relation to students’ academic performance was motivating students to achieve higher scores. When completing an SMTS entry, students had to note the score that they received on the initial assignment, which automatically color-coded that specific cell of the spreadsheet. This color-coding function seemed to be a huge motivator to students. These results align with previous scholarship on the connection between color-coding, emotions, and future decision making (Trudel et al., 2015; Weller & Livingston, 1988). In a focus group interview, Alex commented about the SMTS that “[Colors] make it stand out like, 'Caution! You have a two, you're gonna die!'” This quote clearly illustrates how translating students’ raw scores on assignments into blocks of color in their SMTS made it more of an emotional experience that motivated them to try and do better on the next assessment. These results also align with existing literature on the relationship between progress tracking and motivation and engagement (Glover, 2013; Yang, 2021). In this study, students seemed to have a higher level of motivation due to using the SMTS, which may have led to their higher academic performance. Additionally, the visual progress tracking that the SMTS provided for students shares many similarities with

progress tracking and achievement recognition in gamified learning, which has also been shown to increase student motivation (Enders & Kapp, 2013).

Reassessment and extension. Both rates of reassessment and extension rose significantly between the pre-test and post-test period and was found in the qualitative data to also be a benefit for the students. Students' rate of reassessment increased from about a third of the time when reassessment was needed at the start of this study to almost all of the time when reassessment was needed at the end of the intervention. Students' rate of extension increased from only about a tenth of the time at the start of this study to about half of the time that an extension opportunity was offered at the end. These results for both reassessment and extension show that the intervention successfully pushed students to engage more frequently in both reassessing and extending.

This growth in both reassessment and extension can be explained by the addition of the blended learning intervention time into the classroom framework. Because of the way the class time was laid out, including the initial lesson and assessment and the subsequent blended learning and reassessment, students all had the time and resources to either reassess or extend within the bounds of the class. This aspect of the blended learning used in this study is supported by previous findings that the effectiveness of blended learning is based on how it is leveraged to differentiate instruction for students rather than the complexity of digital content (Fazal et al., 2020). Additionally, the SMTS helped students to recognize when they needed to reassess, which may have made them more likely to follow through on the blended learning and reassessment. In a focus group interview, Blake commented that a benefit to using the SMTS was "knowing that you need to retest would probably be the best thing. You can just go into the SMTS and look

to see that you need to retest on those assignments." Although students had 24/7 access to their grades via Infinite Campus, the SMTS served as a reinforcement or extra reminder for students when they had grades below a score of 3 and thus needed to reassess. In line with previous research on teacher-centered versus student-centered pedagogical models (Ketonen, Lehesvuori, Pöysä, Pakarinen, & Lerkkanen, 2022), students' access to Infinite Campus is a teacher-centered tool in which the student has a passive role, and the SMTS is a student-centered tool in which the student takes an active role. Additionally, the SMTS can be seen as a "nudge," which is a suggestion conveyed to students that may influence their future behavior (Sherr, Akkaraju, & Atamturktur, 2019).

Missing assignments. Students' rate of missing assignments decreased after applying the intervention used in this study, suggesting that they were procrastinating less, better managing their time in order to complete assignments by the deadline, and exhibiting higher levels of self-control. This is a significant finding, as students who procrastinate finishing their work tend to have lower grade point averages (Franz, 2020). On the other hand, students with higher self-control ratings tend to have better academic performance (Horn & Kiss, 2018). While the rate of missing assignments in this study was relatively low to begin with, it is important to note that after the intervention was applied, students had no missing assignments, signifying that missing assignments were not an issue at all by the end of the intervention period. This is a key finding, as students failing to complete and turn in their work is a fairly common occurrence (Franz, 2020). By having fewer missing assignments, students were completing the classwork that was intended to facilitate their learning, and thus resulted in students having a better and more complete learning experience. Additionally, students with better time management skills

typically have fewer missing assignments and higher course scores (Humpherys & Lazrig, 2021), further supporting how the reduction in missing assignments that occurred in this study is an important finding.

The quantitative outcomes regarding missing assignments were supported by the qualitative findings and could have been achieved from two different aspects of the intervention. The first is the fact that opportunities for reassessment and extension were built into regular class time as mentioned above. One benefit of this type of classroom setup is that students who did not turn in their initial assessment were somewhat forced to get this completed at the start of blended learning time. This aspect of the intervention aligns with the mastery learning approach, in that students could not move onto the next activity until they had mastered the preceding activity (Bloom, 1968; Morphew et al., 2020). If a student did not turn in the initial assessment, they would not be able to move past that point. Upon finishing the initial assessment, I would check over students' work and give them their score on the spot, allowing them to make a quick SMTS entry and start that blended learning for the day.

The second aspect of the intervention that may have led to a decrease in students' missing assignments at the end of the intervention period was the added accountability that the SMTS afforded. As mentioned above, students' use of the SMTS seemed to make their scores, or lack of a score if they had a missing assignment, more apparent and more motivating to them. To illustrate this, Devon said about the SMTS in a focus group interview "When I look in Infinite Campus I'm like 'another grade. Oh look one two out of the 500 other threes.' Versus when I'm in this class, it makes it a bigger deal, almost." This quote further supports the quantitative data to show the way in which the SMTS

made students feel more accountable for their work in class, which could have resulted in students turning in their work and having fewer if any missing assignments. Using an intervention including blended learning and the SMTS resulted in students having better academic performance, including grades on assignments, their frequency of reassessment and extension, and number of missing assignments.

Research Question 3: How and in what ways does the implementation of the blended learning intervention, combined with a self-monitoring tracking system, affect students' experiences of learning English language arts content?

For this research question, I wanted to know how the intervention used in this study impacted students' day to day experiences while in my English language arts classroom. Overall, based on both quantitative and qualitative data, students' experiences while engaged in the intervention period were neutral to positive. These results reflect the existing literature regarding blended learning, as it has been shown to positively impact student satisfaction (Truitt & Ku, 2018; Williams, Bland, & Christie, 2008). Tracking and self-monitoring practices and their relationship to student satisfaction have been less intensively studied, so this study adds to the existing literature in this area. In the following sections, students' experiences of learning English language arts context as a result of the intervention used in this study will be discussed, first in terms of the SMTS, and then in terms of blended learning intervention time.

Self-Monitoring Tracking System. The SMTS played a large role in students having a positive experience with the intervention used in this study. The primary quantitative data source, the SEEI, when combined with the qualitative data revealed students to have overtly positive experiences using the SMTS. For example, from focus

group interviews, ten students reported that the automatic color-coding system that was applied when they input assignment scores was something that they liked. Taylor specifically stated that the use of color within the SMTS was "a great way to like visually see how you've been doing and how you've progressed. And the colors again, it's really nice. I love the colors." Students seemed to really enjoy the way in which the SMTS offered them a visual representation of their progress in class. In a previous study, similar self-monitoring logs have resulted in positive student reactions (Sherr, Akkaraju, & Atamturktur, 2019).

Although students were able to view all of their scores on assignments for all of their classes via Infinite Campus, the SMTS created for this study proved to be an easier way for them to visualize how they were doing in class. To illustrate this point, Alex reported in a focus group interview that "Infinite Campus confuses me, but I like [the SMTS] because you automatically see where you started and where you ended up." Overall, students' identified having positive experiences in class and they benefited from using the SMTS in that it made viewing their grades and progress over time easier, less cluttered, and more visually impactful for them. Students that did not feel the SMTS to be overtly helpful held it in a neutral view. Taylor said of the SMTS, "I don't think there's really a downside to it. Like you can do it and it helps you and not doing it is just nothing." This statement reveals that while not every student found satisfaction in using the SMTS, they recognized its usefulness and did not have any negative feelings towards using it.

Blended learning. The blended learning portion of the intervention also bolstered students' experiences in my English language arts class, as was found in both the

quantitative and qualitative data outcomes. This is in alignment with previous scholarship that has connected blended learning to higher levels of student satisfaction (Banerjee, 2011; Melton et al., 2009; Truitt & Ku, 2018). The quantitative data revealed that students generally had a positive experience when engaged in blended learning, although they did not necessarily feel amused or excited during blended learning time. In the existing literature focusing on student satisfaction and blended learning, satisfaction is covered more broadly and the levels of amusement and excitement that students may feel while participating in blended learning are not frequently separated out, making this finding a unique addition to the concept of student satisfaction with blended learning. The qualitative data revealed students to have a stronger, more positive experience when engaged in the blended learning portion of this study. For example, when talking about how blended learning was structured within the class schedule, Devon said in a focus group interview that “It also doesn't give you like the anxiety of, 'Oh, no. I'm gonna get a two. And there's nothing I can do to fix it.' It's like, there is a way to fix it. You don't have to worry.” This quote evidences that Devon came to count on blended learning as something to ease their anxiety about grades, as they knew that there would always be a system in place for them to relearn and reassess on an assignment if they did not score well the first time. Test anxiety is highly related to student performance (Pintrich & De Groot, 1990), so reducing stress and anxiety around grades could contribute to students having better achievement in class. This reduction of stress and anxiety about grades was a successful component of the blended learning intervention time as students’ anxiety around grades and test scores has been shown to have a negative relationship with academic performance (Barrows, Dunn, & Lloyd, 2013; Pintrich & De Groot, 1990).

Additionally, students seemed to appreciate the opportunity that blended learning gave them to extend above grade level expectations. Despite the grading system in place at my school including the score of 4 to provide teachers with an opportunity to create above grade level experiences for students, this quote makes it clear that this option was not being used ubiquitously throughout the school. This, therefore, was another successful aspect of the blended learning intervention time, as blended learning has been shown to be effective in facilitating differentiated instruction, allowing for students to extend beyond grade level expectations (Brodersen & Melluzzo, 2017). Two students commented in a focus group interview:

Sam: "Not a lot of teachers give the option for a four. I like how we get the option for a four every time."

Alex: "When you're going for a 4 it's like more fun and relaxing."

Even though quantitative data from the SEEI did not show that students felt the blended learning was fun, it was expressed from Alex how the level 4 work that they engaged with during blended learning was enjoyable for them. Especially for students who are ready for more challenging material, having an opportunity to engage in more challenging activities can reduce boredom and increase satisfaction (Miller & Niemi, 1995; Sears et al., 2017). Overall, students had a neutral to positive experience with the intervention used in this study. While the general perception of the intervention was not overly joyful, students did not seem to mind it and recognized the ways in which both the SMTS and blended learning were helpful to them.

Implications

The results of this research have personal implications as well as implications for other teachers, practitioners, and researchers. Three types of implications will be considered in this section: (a) personal implications, (b) implications for teachers considering using the intervention used in this study, and (c) implications for future research.

Personal Implications

Because of my experience with this study, I have learned many things about my teaching practice that will shape the way I teach in the future and lead others. These implications include: (a) promoting blended learning, (b) using a tracking and monitoring system to promote time management, and (c) using color-coding to motivate students.

Promoting blended learning. Before completing this study, I was skeptical about how well blended learning would work in a middle school English classroom. My first reservation was the age and maturity level of typical 8th-grade students, as based on my personal experience, I felt that they would not be overwhelmingly successful in a learning environment that required a high level of student independence. Despite this, I wanted to utilize an intervention using blended learning as blended learning has been shown to increase students' level of independence in academic settings (Sari & Amalia, 2021; Wahyuni, 2018). To be successful in blended learning environments, students need to have a certain degree of self-discipline (Shakeel, Haolader, & Sultana, 2023). Students who do not already have well-developed SRL skills can struggle in online environments (Marino, 2000), and students with better-developed SRL skills perform better in online learning spaces (Carter, Rice, Yang, & Jackson, 2020), which made me wonder if the

blended learning used in this intervention would cause students at the 8th-grade level to struggle. I was also skeptical about how well English language arts content would fit into blended learning modules. Blended learning has shown to be successful in content areas like math and science (Jones, 2016; Smith & Suzuki, 2015) both of which tend to have more concrete topics and content. However, English language arts content is often more abstract, which I thought would be difficult to translate into a contained blended learning module. Most studies that focus on blended learning and English focus specifically on literacy (Wilkes et al., 2020) or focused specifically on students learning English as a second language (Albiladi, & Alshareef, 2019). However, I chose to include blended learning in the intervention used in this study as there have been some studies that link blended learning interventions to higher reading achievement (Pace & Mellard, 2016; Prescott et al, 2018). Therefore, this research adds to the paucity in the literature of English language arts blended learning.

During this study, I found that blended learning works quite well for middle school students. After I gave students initial directions about how the blended learning intervention time would work, they caught on quickly and needed little guidance from me. In fact, students came to appreciate the independence that they were able to have on blended learning days. For example, Sam commented about blended learning in a focus group interview, “I think it's really good to be able to try out different techniques and not always have, ‘This is the way you retest.’ It's different every time and you're making sure you understand it.” In this comment, Sam underscored the freedom and independence that they experience during blended learning because they were free to use strategies that worked for them in order to better understand the material. This aligns with previous

research, as blended learning has been shown to positively affect students' independence in class (Sari & Amalia, 2021; Wahyuni, 2018). After seeing the positive way that my 8th-grade students reacted to the blended learning time and the way blended learning furthered their learning English, I will include blended learning as a regular part of my future classroom instruction.

Using a tracking and monitoring system to promote time management. Another finding that surprised me was the fact that students had no missing assignments by the end of the intervention. This finding revealed that having students use the SMTS, paired with blended learning time, helped them to better manage their time and thus submit all of their classwork on time. Time management is typically understood as a process that includes setting and prioritizing goals, planning, monitoring how time is spent, and purposefully allocating time accordingly (Macan, 1994). In this study, students were prompted by their use of the SMTS to set goals for themselves in my class, plan how they would achieve those goals, and set aside and monitor how they used class time in order to attain their desired outcome. These components also line up with many of the components of various SRL models, including forethought and planning (Pintrich & DeGroot, 1990; Pintrich, 2000; Zimmerman, 2000), goal setting (Beokaerts, 1988; Winne, 2011; Zimmerman, 2000), and monitoring and controlling effort (Pintrich & DeGroot, 1990; Pintrich, 2000).

Additionally, time management has been linked to academic success for college students (Hoops & Artrip, 2016), and interventions targeting time management skills have been shown to increase the academic performance of younger students with ADHD (Abikoff et al., 2009). Adequate time management skills have also been linked to higher

job performance and quality of life (Macan, 1994). Highlighting the importance of time management skills, time management supports are the most common interventions given to students at universities (Wolters & Brady, 2021). Because time management is an extremely important skill for students to build for their overall academic success, SRL skills, and future job success, using some sort of tracking and monitoring system will become standard procedure in my future teaching in order to better prepare students for future academic and career environments.

Using color-coding to motivate students. When designing the intervention for this study, I expected the most significant findings of this study to be what other scholars have reported in relation to the blended learning portion (Ceylan & Kesici, 2017; Ryan et al., 2016). However, after analyzing all data, it became clear to me that the SMTS had a profound motivational effect on students. Specifically, the color-coding that was embedded into the SMTS proved to be extremely motivating to students (Weller & Livingston, 1988). Instead of just seeing a numerical score in a gradebook, students found more of an emotional response when seeing the color-coded score in their SMTS entry. Motivation is an important aspect of SRL (Beokaerts, 1988; Pintrich et al., 1993; Zimmerman, 2000). Additionally, motivation is linked to student success (Hoops & Artrip, 2016). Because of this, using color in score tracking is something that I will incorporate in some way in my future teaching practice. While I have always used color coding to enhance my own organizational skills and SRL, seeing how my 8th-grade students also found use of color to be beneficial in their tracking their scores, their progress in class, I will make this a regular practice in the future.

Implications for Teachers Considering Using Blended Learning and the SMTS

As a result of this study, I have discovered some implications that are important for teachers who are considering using the intervention used in this study. These implications include (a) the importance of directly teaching SRL strategies, (b) design of blended learning modules, and (c) considering additions to blended learning to make it more appealing.

The importance of directly teaching SRL strategies. When designing this intervention, I knew that directly teaching SRL strategies to students would be important, as scholarship on SRL has overwhelmingly shown that the direct teaching of SRL strategies is necessary for these strategies to become embedded in students' internalized learning practices (Ghanizadeh, 2017; Kistner et al., 2010; Meyers et al., 2013). Because of this, I made it a point to explain various SRL strategies to students and make it clear to them why they were being asked to engage these strategies. The SRL strategies that I focused on most heavily in this study were monitoring cognition, monitoring effort, goal-setting, and planning.

Monitoring cognition and monitoring effort align with Pintrich's (2000) monitoring phase of SRL. In the cognition domain of this phase, students utilize metacognitive awareness and monitor their understanding of content. In the behavior domain of this phase, students have an awareness of the effort they put forth on a given task. In this study, students were encouraged to monitor their cognition via both the SMTS and blended learning. When completing the "Why do you think you earned this score?" portion of the SMTS, I explained to students that this was a place for them to take stock of their understanding of content. During the blended learning time, students

monitored their cognition by choosing activities that they thought would best support them. For example, in a blended learning module that focused on vocabulary, students were given additional notes on each vocabulary word, but were only asked to record information that they found helpful in their notes. Students were also encouraged to monitor their effort via the "Why do you think you earned this score?" portion of the SMTS. When introducing this portion of the SMTS, I explained to students that results on graded assignments often stem from effort, and that this should be a place where they recorded effort levels. As an example, I told students they may choose to record something like, "I did not initially take notes in class and as a result did not do well on the assessment."

Planning and goal-setting SRL strategies align with Zimmerman's (2000) forethought phase of his SRL model. In this phase, students analyze the task ahead, motivate themselves to act, and consider what will be necessary in order to complete the task. In this study, students were encouraged to plan and set goals primarily through their use of the SMTS. When completing SMTS entries as a class, I explained to students that by completing the "Do you need to reassess?" and the "Next Steps" portions of the document, that they were engaging in planning and goal setting for the blended learning that they would engage with after completing their SMTS entry.

After completing this study and analyzing the data, I realized that while several SRL strategies were worked into the intervention (monitoring cognition, monitoring effort, goal-setting, and planning), there was room for more strategies to be worked in and each strategy could have been more completely taught to students. For teachers considering using this intervention in their own practice, previous scholarship has

suggested that the following actions are necessary for students to effectively learn SRL strategies: (a) introducing the SRL strategy by defining it and modeling it, (b) explaining why the strategy works, (c) explaining how the strategy can be useful in other contexts, and (d) providing opportunities for students to perfect the strategy via practice (Kiewra, 2002; Pressley & Woloshyn, 1995). In this research, students may have had significant gains in their SRL skills if they had been more directly taught as part of instruction time. For future use by other educators, it may be helpful to create a regular system that includes all of these actions listed above for each SRL strategy that is introduced to students. Doing so could allow students to better absorb each SRL strategy and heighten the likelihood that they would internalize the strategy and begin to use it independently.

Design of blended learning modules. While applying the intervention used in this study, students were given an initial traditional lesson, completed an assessment, completed an SMTS entry based on the results of this assessment, completed a blended learning assignment, completed another assessment, and updated their SMTS as applicable. All of these actions occurred during the span of one week of class time. While there was enough time to comfortably fit in all of these components, those considering using this intervention in their own practice should focus on creating simple blended learning modules. In designing the intervention used in this study, I had to break away from viewing a blended learning module as something that needed to be very complex and technologically advanced. While there is a place for more complex blended learning in education, activities like creating videos or using adaptive technology can be very time consuming. Also important to consider is that quality blended learning relies on sound pedagogy and that the ultimate concern should not be the actual technologies used to

create the blended learning (Bonk, Kim, & Zeng, 2006). In a previous study in which the researcher created videos for flipped learning material, they noted the extreme time commitment of creating learning materials in this way (Florence & Kolski, 2021).

In this study, I created each blended module using Google Slides, and input content into these slides, using hyperlinks to connect specific slides to each other. I used the same format for each blended learning module, so that I was not coming up with a completely new design each time. In addition to saving me time, this aspect of creating the blended learning modules also kept each module consistent. Consistency in blended and online learning is an important factor and helps students to better adapt to the modules (Ní Uigín & Cofaigh, 2021). In another study, researchers found that using a very basic chat feature to facilitate blended learning still led to positive academic results (Servos, Reiß, Stosch, Karay, & Matthes, 2023). When creating a minimum of one blended learning module per week, keeping things simple is important for the sustainability of the intervention. In my experience, each blended learning module took me between fifteen to thirty minutes to create. This was an important success factor of the intervention, because teachers often find themselves with little time to create instructional plans and materials (Altemueller & Lindquist, 2017). By keeping the content and the design of the blended learning modules simple and straight-forward, I was able to easily create one blended learning module per week without burning out, which made the intervention sustainable. Had I set out to design more complicated blended learning modules, this intervention would have been difficult to implement and not something that could be sustained for regular classroom instruction. Teachers need to be mindful about the amount of time it takes to create blended modules, as this is a challenge that is

associated with implementing blended learning (Mayer, Ring, Muche, Rothenbacher, & Schmidt-Strassburger, 2015). While shown to be effective in this study, the time it takes to design the blended learning modules cannot be overlooked.

Considering additions to blended learning to make it more appealing. While the blended learning used in this intervention was effective in improving students' academic performance, students did not necessarily consider it to be exciting or amusing. Based on the quantitative data from the SEEI, students rated the blended learning portion of the intervention slightly below the neutral threshold. When creating the blended learning modules used in this intervention, I was mindful of including elements that I thought would appeal to students, although this was not a primary focus. While I did not want the Google Slides to appear overwhelmingly busy with colors and graphics, I did choose simple design themes that incorporated a few colors and menial graphics. I also made sure to spread content out appropriately over several slides to ensure that students did not feel overloaded by the amount of information on a single slide. When choosing content for each blended learning module, I purposefully pulled together various types of content within a single blended learning module in order to provide students with some variety. For example, in one blended learning module, I included an image for students to work with, a YouTube video, and a short article to read. For teachers considering using this intervention, it may be worthwhile to explore some additional ways to make the blended learning part of the intervention more exciting for students. Blended learning is often praised for its ability to leverage the convenience of online learning without losing the social aspect of a traditional classroom (Banerjee, 2011; Melton et al., 2009).

In previous studies, social media has been embedded into blended learning to assist in social engagement and active learning, and student learning outcomes as well as overall satisfaction were positively affected (Knowles & Cooner, 2016; Megele, 2015). Although incorporating social media in a middle school classroom would look different and would pose different challenges, this could be one way to increase student engagement with the blended learning portion of the intervention. Another element that could be added to the blended learning portion of the intervention used in this study is a communication feature. Using a simple chat forum has been shown to be effective in increasing student engagement (Servos et al., 2023). Allowing students to use a digital class communication forum either before, during, or after the blended learning modules could boost students' satisfaction with the intervention. Another element that typically increases student engagement and satisfaction in blended or online learning environments is including collaborative activities (Dixson, 2010; So & Brush, 2008). In future use of the intervention used in this study, students could be grouped based on their initial assessment and work through portions of the blended learning together. Cho and Heron (2015) noted that when students have a higher degree of learner autonomy, they tend to have higher levels of satisfaction with the learning. To add more learner autonomy in future iterations of the intervention used in this study, there could be different options embedded within the blended learning, rather than the two options to either reassess to the score of three or extend to the score of four. Options could be content based, such as providing different resources for students to choose from during the blended learning. Options could also be assessment based, in that students could choose how to demonstrate their learning at the end of the module.

While the participants of this study did not report having a negative experience with the blended learning portion of the intervention, they did not reveal having overly excited attitudes towards it, which is an element of the intervention that could be improved for future use. Positive emotions such as excitement and amusement are positively connected to motivation (MacIntyre & Vincze, 2017). By making the students feel more excited or amused by the blended learning, students may feel more motivation and thus perform better in class. Including elements such as social media integration (Knowles & Cooner, 2016; Megele, 2015), communication features (Servos et al., 2023), opportunities for collaboration (Dixson, 2010; So & Brush; 2008), or ways for students to have more autonomy (Cho & Heron, 2015), are all possible adjustments that could be made to the blended learning portion of this intervention to make it more fun and appealing for students.

Implications for Future Research

This study and its findings offer implications for future research, specifically for teachers looking to implement the intervention used in this study in their classrooms as an action research study or for researchers who want to learn more about blended learning combined with a tracking and monitoring system. There is a lack of research on interventions that combine blended learning with a tracking and monitoring system, and this study begins to fill that gap. In this section, I will discuss implications regarding (a) specific research populations, and (b) adjustments to the study design.

Specific research populations. The findings of this study open up avenues for future research, especially regarding specific populations of students. One possible population to focus on in future research is gifted and talented students. Blended learning

is already being used to provide gifted and talented students with coursework and academic experiences that would not be available to them within the bounds of their brick-and-mortar schools (Swan et al., 2015). The findings of this study revealed that students were appreciative of the opportunity to extend to the above grade level score. Additionally, some students expressed the sentiment that they enjoyed the level four work more than regular schoolwork, and that they experienced less stress when completing this work. Gifted and talented students need daily challenges, as well as regular opportunities to work independently and receive differentiated instruction (Rogers, 2007). Because of this, it may be worthwhile to continue this research and focus specifically on students that are designated gifted and talented. This would align with existing scholarship on gifted and talented students, where blended learning has been suggested as a method to better support gifted and talented students' unique needs (Sanguras, 2021).

On the other end of the spectrum, future research could also focus specifically on underperforming students, where "underperforming" can refer to any student who is not earning passing grades or demonstrating grade-level appropriate work. Blended learning has been shown to increase the academic performance of underperforming students because of its tendency to help transitioning college students acquire learning skills (Bazelais & Doleck, 2018). Blended learning has also been shown to increase elementary students' literacy skills (Schechter, Macaruso, Kazakoff, & Brooke, 2015), which could be a large factor in how well students perform in academic environments. Students with disabilities have also been shown the benefit from blended learning (Andujar & Nadif, 2022).

The benefits of using blended learning modules with diverse populations of students is well documented. Sanguaras (2021) and Swan et al. (2015) support the use of blended learning modules with gifted and talented students. The research of Prescott et al. (2018), Schechter et al. (2015), and Wilkes et al. (2020) shows blended learning to be useful for students with low reading skills, and Jones (2016) cites success with blended learning in raising elementary students' math proficiency. Andujar and Nadif (2022) point to blended learning as an effective intervention for students with learning disabilities. Because of the many different populations that blended learning has been shown to benefit, I suggest future research that combines blended learning with a tracking and monitoring system with any of these populations of students is needed.

Adjustments to the study design. This study sought to investigate how the intervention affected students' SRL, academic performance, and 8th-grade students' perceptions of their learning experiences. To measure both students' SRL and academic performance, a pre-test and post-test model was used in order to detect changes that occurred for both of these variables after the intervention had been applied. This was not the case when measuring students' perceptions and experiences, as the SEEI and focus group interviews were only conducted at the conclusion of the intervention. For future research, it may be beneficial to design an instrument that could be administered both before and after the application of the intervention, which would allow for inferential statistical analysis and more purposeful significance of the results (Creswell, 2013). Inferential statistics allow researchers to determine statistical significance of quantitative results (Creswell, 2020). The paired samples t-test is a commonly used method in research designs in which participants are pre-tested, engaged in an intervention, and then

post-tested (Creswell, 2020). Using an instrument to measure students' perceptions and experiences before and after receiving the intervention would allow for any significant changes to be noted and investigated further.

Additionally, all of the data that was collected about students' perceptions and experiences in this study were self-reported by the students either via the SEEI or in verbal responses during the focus group interviews. Because of the age of the students in this study, the depth of the data generated may have been limited. Although even young children are capable of forming opinions and communicating complex ideas, when adults interview children, there can be a power relationship at play even when the researcher takes steps to mediate this. Because of this, students may respond in the way they think the adult wants them to respond (Ponizovsky-Bergelson, Dayan, Wahle, & Roer-Strier, 2019). To provide a fuller body of data regarding students' perceptions and experiences, another instrument could have been used to directly capture students' behaviors from the researcher's perspective during the intervention. One such instrument could be an observation guide for the researcher to complete while students are engaged in the intervention. Such an instrument could provide a fuller picture of students' experiences and mitigate for the possibility that students may not respond in a completely honest manner in an interview setting. Observation instruments can allow for the researcher to gain information that may not be collected through surveys (Patton, 2002). A final possible adjustment to the design of this study would be to more heavily connect English language arts content to the intervention. Although the intervention used in this study was situated within an English language arts classroom, the connection to language arts

content was not prioritized in this study and could be explored in greater depth in future research.

Limitations

There are limitations to this action research study. These include (a) limitations due to inability to generalize action research, (b) limitations due to not all best practices of SRL being used in the intervention, and (c) limitations of the MSLQ. .

Limitations due to inability to generalize action research. As this study was an action research study, its purpose was to have practical application and sought to directly solve problems of practice within my specific context (Mertler, 2020). Action research, while providing valuable information to stakeholders, is not conclusive (Mertler, 2020). These features of action research makes it valuable for practitioners, but means that it cannot be generalized to larger populations. In an article focused on action research with middle school students, Monem and Cramer (2022) assert that the most appropriate audiences to share action research results with are colleagues, students, and parents. As action research is intended to improve problems that exist in specific contexts, it should be shared with these audiences in order to make improvements to individual classrooms or even to an entire school (Monem & Cramer, 2022). Rather than using action research results to generalize to larger populations, the process and results of action research are intended to provide professional growth and development for the researcher and the stakeholders involved in the research (Black, 2021). Research can be made generalizable by expanding the study site to include more than just one classroom (Creswell, 2014). To make this research generalizable, future researchers could apply the intervention used in

this study in all 8th-grade content classes, or could be used in all English language arts classes across multiple grade levels taught by numerous teachers

Limitations due to not all best practices of SRL being used in the intervention.

Previous scholarship has noted that direct teaching of SRL strategies is necessary in order for students to best learn these strategies and begin using them on their own (Ghanizadeh, 2017; Kistner et al., 2010; Meyers et al., 2013). When designing the intervention used in this study, the blended learning combined with the SMTS was intended to put students in situations in which they would have to use various SRL strategies. The SMTS was designed to align with the components of Pintrich's (2000) SRL model: forethought, planning, and activation; monitoring, control, and reaction and reflection. The "Next Steps" portion of the SMTS encouraged students to set goals and activate knowledge of metacognitive processes. The "Confidence with ELO" portion of the SMTS allowed students to make efficacy judgments about their ability. The blended learning portion of the intervention was designed to allow students to act on the plans that they made for themselves in the SMTS and use various learning strategies to realize the goal they had set for themselves. However, in the execution of the intervention, I could have more extensively explained how certain SRL strategies work and explained how the strategies could be useful in other contexts, rather than relying primarily on students acting out the strategies. I could have also been more intentional in planning how SRL strategies were introduced to students and discussed in class throughout the intervention. One example of this could be directly prompting students to self-reflect by asking prompting questions such as, "Did you meet all of the goals of the learning task?" and "Which strategies were

effective for this particular learning task?" (Moos & Ringdal, 2012). Making such adjustments to this intervention could better support students' SRL growth.

Limitations of the Motivated Strategies for Learning Questionnaire. In this study, the MSLQ was heavily relied upon to measure students' SRL skills before and after receiving the intervention. While the MSLQ is a widely-used instrument used to measure students' SRL, it was created to be a general instrument that could be used for different types of courses (Pintrich et al., 1991). Although this aspect of the MSLQ makes it a good choice for researchers who are investigating many different types of courses, its lack of specificity to an English language arts classroom was a limitation of this study. Using a more specific instrument to measure students SRL skills within the specific confines of an English language arts class may have provided richer and more useful information in this study.

Chapter Summary

The purpose of completing this research was to investigate an intervention that could assist middle school students in developing the SRL skills, improving their academic performance, and provide a positive experience in their English language arts course. To achieve these purposes, the intervention used in the study combined elements of blended learning with an achievement tracking and behavior monitoring tool (SMTS) to provide students with the tools to be better self-regulated learning and thus perform better academically and have a more positive experience. The SMTS was a researcher-developed tool in which students kept track of their academic progress in class in addition to their learning and studying habits. After students completed an entry in the SMTS, they were provided with a blended learning module that allowed for them to relearn

content and improve their score, or work with learning materials above grade-level. This research was important to conduct at Branch Middle School due to the grading system adopted by the school district, in which students with poorly-developed SRL skills would be less likely to succeed.

This action research study utilized mixed-methods, and study participants were eighth-grade students in an English language arts class within Branch Middle School, in Southeast Minnesota. Quantitative data collection was collected from the Motivated Strategies for Learning Questionnaire, Student Engagement and Experience Inventory, course grades, number of missing assignments, and frequency of reassessment and extension. Qualitative data included focus group interviews and open-ended student responses. Findings revealed that the intervention did not have a positive impact on students' SRL skills. However, the intervention did have a positive impact on students' performance on coursework and their experiences in the class. A key finding of this study is that students' use of the SMTS helped students stay motivated in class and served as a way for students to reflect on their learning and use of learning strategies. Using the SMTS in isolation or along with blended learning modules could help other middle school teachers capture student motivation and guide them to be reflective about their learning, potentially improving both their academic performance and experience in class.

REFERENCES

Abikoff, H., Nissley-Tsiopinis, J., Gallagher, R., Zambenedetti, M., Seyffert, M., Boorady, R., & McCarthy, J. (2009). Effects of MPH-OROS on the organizational, time management, and planning behaviors of children with ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry, 48*(2), 166—175.

Adeniji, S. M., Ameen, S. K., Dambatta, B. B., & Orilonise, R. (2018). Effect of mastery learning on senior school students' academic performance and retention in circle geometry. *International Journal of Instruction, 11*(4), 951–962.

Albiladi, W. S., & Alshareef, K. K. (2019). Blended learning in English teaching and learning: A review of the current literature. *Journal of Language Teaching and Research, 10*(2), 232—238.

Alexandre, J., & Enslin, C. (2017). The relationship between personalized instruction, academic achievement, knowledge application, and problem-solving skills. *National Teacher Education Journal, 10*(7), 10–15.

Alexiou-Ray, J. A., Wilson, E., Wright, V. H., & Peirano, A. (2003). Changing instructional practice: The impact of technology integration on students, parents, and school personnel. *Electronic Journal for the Integration of Technology in Education, 2*(2), 58–80.

Altemueller, L., & Lindquist, C. (2017). Flipped classroom instruction for inclusive learning. *British Journal of Special Education, 44*(3), 341–358.

Anderson, J. A., Reder, L. M., & Simon, H. A. (1997). Situative versus cognitive perspectives: Form versus substance. *Educational Researcher, 26*(1), 18–21.

Anderson, L. W. (1976). An empirical investigation of individual differences in time to learn. *Journal of Educational Psychology, 68*, 226–233.

Andujar, & Nadif, F. Z. (2022). Evaluating an inclusive blended learning environment in EFL: A flipped approach. *Computer Assisted Language Learning, 35*(5-6), 1138–1167.

Atkins, J. (2018). *The impact of self-assessment on student engagement during independent reading.* (Doctoral dissertation). Retrieved from University of South Carolina Scholar Commons.

Ayub, N. (2010). Effect of intrinsic and extrinsic motivation on academic performance. *Pakistan Business Review, 8*(1), 363—372

Azevedo, R. (2005). Using hypermedia as a metacognitive tool for enhancing student learning? The role of self-regulated learning. *Educational Psychologist, 40*(4), 199–299.

Bahceci, F., & Gurol, M. (2016). The effect of individualized instruction system on the academic achievement scores of students. *Education Research International, (2016),* 1–9.

Bahri, A., Idris, I. S., Muis, H., Arifuddin, M., & Jibran Nidhal Fikri, M. (2021). Blended learning integrated with innovative learning strategy to improve self-regulated learning. *International Journal of Instruction, 14*(1), 779–794.

Bakeman, R., & Robinson, B. F. (2005). *Understanding statistics in the behavioral sciences*. Psychology Press. New York, NY.

Banerjee, G. (2011). Blended environments: Learning effectiveness and student satisfaction at a small college in transition. *Journal of Asynchronous Learning Networks, 15*(1), 8–19.

Barber, L. K., Bagsby, P. G., Grawitch, M. J., & Buerck, J. P. (2011). Facilitating self-regulated learning with technology: Evidence for student motivation and exam improvement. *Teaching of Psychology, 38*(4), 303–308.

Barnes, M. (2015). *Assessment 3.0*. Thousand Oaks, CA: Corwin.

Barrows, J., Dunn, S., & Lloyd, C. A. (2013). Anxiety, self-efficacy, and college exam grades. *Universal Journal of Educational Research, 1*(3), 204—208.

Bazelais, P., & Doleck, T. (2018). Investigating the impact of blended learning on academic performance in a first semester college physics course. *Journal of Computers in Education, 5*, 67—94.

Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: From the general to the applied. *Journal of Computing in Higher Education, 26*, 87—122.

Black, L. (2021). Implementing action research in a teacher preparation program: Opportunities and limitations. *The Canadian Journal of Action Research, 21*(2), 47–71.

Bloom, B. S. (1968). Learning for mastery. *Education Comment, 1*(2), 1–12.

Bloom, B. S. (1971). *Mastery learning theory and practice*. New York, NY: Holt, Rinehart & Winston.

Boekaerts, M. (1988). Motivated learning: Bias in appraisals. *International Journal of Educational Research, 12*, 267–280.

Boekaerts, M., Pintrich, P. R., & Zeider, M. (2000). Self-regulation: An introductory overview. In *Handbook of self-regulation* (pp. 1–9). San Diego, CA: Elsevier Academic Press.

Boekaerts, M. (2011). Emotions, emotion regulation, and self-regulation of learning. In B.J. Zimmerman & D.H. Schunk (Eds.)*, Handbook of self-regulation of learning and performance*, (pp. 408–425). New York, NY: Routledge.

Bonk, C., & Graham, C. (2005). *Handbook of blended learning: Global perspectives, local designs.* San Francisco, CA: Pfeiffer Publishing.

Bonk, C.J., Kim, K., & Zeng, T. (2006). Future directions of blended learning in higher education and workplace learning settings. In C. J. Bonk & C. R. Graham (Eds) *Handbook of blended learning: Global perspectives, local designs*. San Francisco, CA: Pfeiffer.

Borkowski, J. G., & Thorpe, P. K. (1994). Self-regulation and motivation: A life-span perspective on underachievement. In D. H. Schunk, & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 45–73). Hillsdale, NJ: Lawrence Erlbaum Associates.

Brehman, D. K., Burns, S. S., Thaler, N. S., Rojas, S. L., & Barchard, K. A. (2009). *Fatigue: A threat to study results.* Poster session presented at the meeting of the Western Psychological Association, Portland, OR.

Broadbent, J. (2017). Comparing online and blended learner's self-regulated learning strategies and academic performance. *The Internet and Higher Education*, *33*, 24–32.

Broadbent, J., Sharman, S., Panadero, E., & Fuller-Tyszkiewicz, M. (2021). How does self-regulated learning influence formative assessment and summative grade? Comparing online and blended learners. *The Internet and Higher Education, 50*, 1–8.

Brodersen, R. M., & Melluzzo, D. (2017). Summary of research on online and blended learning programs that offer differentiated learning options. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Central. Retrieved from https://ies.ed.gov/ncee/rel/regions/central/pdf/REL_2017228.pdf

Brookhart, S. M. (2012). *Grading and learning: Practices that support student achievement.* Bloomington, IN: Solution Tree Press.

Bryant, D. P., Bryant, B. R., Dougherty, B., Roberts, G., Pfannenstiel, K. H., & Lee, J. (2020). Mathematics performance on integers of students with mathematics difficulties. *Journal of Mathematical Behavior, 58*, 1–13.

[redacted] Public Schools. (2020). *531 district information*. Retrieved from https://sites.google.com/[redacted]12.mn.us/531-district-information/about?authuser=0

Cakir, H., & Bichelmeyer, B. A. (2016). Effects of teacher professional characteristics on student achievement: An investigation in blended learning environment with standards-based curriculum. *Interactive Learning Environments, 24*(1), 20–32.

Caroll, J. B. (1963). A model of school learning. *Teacher College Record, 64*, 723–733.

Carter Jr, R. A., Rice, M., Yang, S., & Jackson, H. A. Self-regulated learning in online learning environments: Strategies for remote learning. *Information and Learning Sciences, 121, 5*(6), 321–329.

Ceylan, V. K., & Kesici, A. E. (2017). Effect of blended learning to academic achievement. *Journal of Human Sciences, 14*(1), 308—320.

Chamot, A. U. (2018). Developing self-regulated learning in the language classroom. In I. Walker, D. Chan, M. Nagami, & C. Bourguignon (Eds.), *New perspectives on the development of communicative and related competence in foreign language education* (pp. 41–52). Berlin, Germany: De Gruyter.

Chang, M.M. (2005). Applying self-regulated learning strategies in a web-based instruction: An investigation of motivation perception. *Computer Assisted Language Learning, 18*(3), 217–230.

Chan, P. E., Graham-Day, K. J., Ressa, V. A., Peters, M. T., & Konrad, M. (2014). Beyond involvement: Promoting student ownership of learning in classrooms. *Intervention in School and Clinic, 50*(2), 105—113.

Changeiywo, J. M., Wambugu, P. W., & Wachanga, S. W. (2011). Investigations of students' motivation towards learning secondary school physics through mastery learning approach. *International Journal of Science and Mathematics Education, 9*, 1333–1350.

Cho, M., & Heron, M. (2015). Self-regulated learning: The role of motivation, emotion, and use of learning strategies in students' learning experiences in a self-paced online mathematics course. *Distance Education., 36*(1), 80–99.

Clark, I. (2012). Formative assessment: Assessment is for self-regulated learning. *Educational Psychology Review, 24*(2), 205–249.

Coenen, M., Stamm, T. A., Stucki, G., & Cieza, A. (2012). Individual interviews and focus groups in patients with rheumatoid arthritis: A comparison of two qualitative methods. *Quality of Life Research, 21*(2), 359–370.

Connor, C. M. (2019). Using technology and assessment to personalize instruction: Preventing reading problems. *Prevention Science, 20*(1), 89–99.

Corno, L. (1986). The metacognitive control components of self-regulated learning. *Contemporary Educational Psychology, 11*, 333–346.

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles, CA: Sage.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. Sage Publications. Los Angeles, CA.

Creswell, J. W., & Creswell, D. J. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Los Angeles, CA: Sage.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: Sage.

DeMink-Carthew, J., & Olofson, M. W. (2020). Hands-joined learning as a framework for personalizing project-based learning in a middle grades classroom: An exploratory study. *Research in Middle Level Education Online, 43*(2), 1–17.

Demir, M. (2021). Alternative assessment methods in primary education: Review and future directions. In S. A. Kiray & E. Tomevska-Ilievska (Eds.), *Current studies in educational disciplines* (pp. 227-288). Istanbul, Turkey: ISRES Publishing.

Dignath, C., & Büttner, G. (2018). Teachers' direct and indirect promotion of self-regulated learning in primary and secondary school mathematics classes: Insights from video-based classroom observations and teacher interviews. *Metacognition and Learning, 13*, 127–157.

Dijkstra, E. M., Walraven, A., Mooij, T., & Kirschner, P. A. (2017). Factors affecting intervention fidelity of differentiated instruction in kindergarten. *Research Papers in Education*, *32*(2), 151–169.

Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, *37*(2), 111.

Dixson, M. D. (2010). Creating effective student engagement in online courses: What do students find engaging? *Journal of the Scholarship of Teaching and Learning*, *10*(2), 1-13.

Edwards, C. M., Rule, A. C., & Boody, R. M. (2017). Middle school students' mathematics knowledge retention: Online or face-to-face environments. *Journal of Educational Technology & Society, 20*(4), 1–10.

Ee, M. S., Yeoh, W., Boo, Y. L., & Boulter, T. (2018). Examining the effect of time constraint on the online mastery learning approach towards improving postgraduate students' achievement. *Studies in Higher Education, 43*(2), 217–233.

Elman, R. J. (1995). Multimethod research: A search for understanding. *Clinical Aphasiology, 23*, 77–81.

Enders, B., & Kapp, K. (2013). Gamification, games, and learning: What managers and practitioners need to know. *The eLearning Guild*, 57–59.

Engel, M., Heinz, M., & Sonntag, R. (2017). Flexibilizing and customizing education using inverted classroom model. *Information Systems Management, 34*(4), 378–389.

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from and instructions design perspective. *Performance Improvement Quarterly, 6*(4), 50–72.

Falconer, I., & Littlejohn, A. (2007). Designing for blended learning and reuse. *Journal of Further and Higher Education, 31*(1), 41–52.

Fazal, M., Panzano, B., & Luk, K. (2020). Evaluating the impact of blended learning: A mixed-methods study with difference-in-difference analysis. *Tech Trends, 64*, 70–78.

Fisher, M., King, J., & Tague, G. (2001). Development of a self-directed learning readiness scale for nursing education. *Nurse Education Today, 7*, 516–525.

Fisher, R., Perenyi, A., & Birdthistle, N. (2021). The positive relationship between flipped and blended learning and student engagement, performance and satisfaction. *Active Learning in Higher Education, 22*(2), 97–113.

Fitriyana, N., Wiyarsi, A., Sugiyarto, K. H., & Ikhsan, J. (2021). The influences of hybrid learning with video conference and "chemondro-game" on students' self-efficacy, self-regulated learning, and achievement toward chemistry. *Journal of Turkish Science Education, 18*(2), 233–248.

Florence, E. A., & Kolski, T. (2021). Investigating the flipped classroom model in a high school writing course: Action research to impact student writing achievement and engagement. *TechTrends, 65*(6), 1042—1052.

Fox, E. (2009). The role of reader characteristics in processing and learning from informational text. *Review of Educational Research, 79*(1), 197–261.

Franz, I. (2020). Unintentional procrastination, self control, and academic achievements. *Education Economics, 28*(5), 508–525. https://doi.org/10.1080/09645292.2020.1801596

Gage, N. L. & Berliner D. C. (1988). *Education psychology* (4th ed.). Boston, MA: Houghton Mifflin Company.

Garcia, T., & Pintrich, P. R. (1996). The effects of autonomy on motivation and performance in the college classroom. *Contemporary Educational Psychology, 21*(4), 477—486.

Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education*. San Francisco, CA: Jossey-Bass Wiley Print.

Gentile, J. R. (2004). Assessing fundamentals in every course through mastery learning. *New Directions for Teaching and Learning, 100*, 15–20.

George, D. (2012). *Gifted education: Identification and provision* (2nd ed.). New York, NY: Routledge.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Ghanizadeh, A. (2017). The interplay between reflective thinking, critical thinking, self-monitoring, and academic achievement in higher education. *Higher Education, 74*(1), 101–114.

Glover, I. (2013). Play as you learn: Gamification as a technique for motivating learners. *Proceedings of Edmedia+ Innovate Learning World Conference on Educational Media and Technology.* Victoria, Canada: Association for the Advancement of Computing in Education (AACE). 1999—2008.

Graham, C. R. (2006). Blended learning systems: Definition, current trends and future directions. In C. J. Bonk & C. J. Graham (Eds.) *The handbook of blended learning: Global perspectives, local designs* (pp. 3–21). San Francisco, CA: Pfeiffer.

Greene, J. A., Copeland, D. Z., Deekens, V. M., & Yu, S. B. (2018). Beyond knowledge: Examining digital literacy's role in the acquisition of understanding in science. *Computers & Education, 117*, 141–159.

Greenwood, D. J. & Levin, M. (2007). *Introduction to action research: Social research for social change* (2nd ed.). Thousand Oaks, CA: Sage.

Guskey, T. R., & Monsaas, J. A. (1979). Mastery learning: A model for academic success in urban junior colleges. *Research in Higher Education, 11*(3), 263–274.

Guskey, T. R. (1980). Mastery learning: Applying the theory. *Theory Into Practice, 19*(2), 104–111.

Haelermans, C., Ghysels, J., & Prince, F. (2015). Increasing performance by differentiated teaching? Experimental evidence of the student benefits of digital differentiation. *British Journal of Educational Technology, 46*(6), 1161–1174.

Harasim, L. (2012). *Learning theory and online technologies*. New York: Routledge.

Herl, H. E., O'Neil, H. F., Jr., Chung, G. K. W. K., & Schacter, J. (1999). Reliability and validity of a computer-based knowledge mapping system to measure content understanding. *Computers in Human Behavior, 15*, 315–333.

Herr, K. & Anderson, G. L. (2005). The continuum of positionality in action research. In *The action research dissertation* (pp. 29–48). Thousand Oaks, CA: Sage.

Hickman, L. (2007). Classical pragmatism, postmodernism, and neopragmatism. *Pragmatism as post-postmodernism: Lessons from John Dewey* (pp. 48-62). New York, NY: Fordham University Press.

Holder, P. (2015). The impact of a standards-based classroom on student perceptions of efficacy and motivation. *Journal of Language Teaching & Learning, 5*(2), 1–21.

Hong, J. C., Hwang, M. Y., Tai, K. H., & Kuo, Y. C. (2016). Parental monitoring predicts students' prosocial and impulsive tendencies relevant to consequence-based reasoning in a blended learning environment. *Interactive Learning Environments, 24*(7), 1534–1551.

Hoops, L. D., & Artrip, A. (2016). College student success course takers' perceptions of college student effectiveness. *Learning Assistance Review, 21*(2), 55—67.

Horn, D., & Kiss, H. J. (2018). Which preferences associate with school performance?—Lessons from an exploratory study with university students. *PlOS One, 13*(2), 1—32.

Humpherys, S. L., & Lazrig, I. (2021). Effects of teaching and practice of time management skills on academic performance in computer information systems courses. *Information Systems Education Journal, 19*(2), 45—51.

International Reading Association. (2013). *Formative assessment: A position statement of the International Reading Association*. Newark, DE: Author.

Ismaji, H., & Imami-Morina, I. (2018). Differentiated instruction: Understanding and applying interactive strategies to meet the needs of all the students. *International Journal of Instruction, 11*(3), 207–218.

Januszewski, A. & Molenda, M. (2008). *Educational technology: A definition with commentary.* New York, NY: Routledge.

JASP Team (2022). JASP (Version 0.16.4) [Computer software]. www.jasp-stats.org

Jones, E. L., Gordon, H. A., & Schechtman, G. (1975). *Mastery learning: A strategy for academic success in a community college*. Los Angeles: CA: ERIC Clearinghouse for Junior Colleges.

Jones, L. D. (2016). *A case study of a blended learning environment with a focus on mastery that greatly impacted mathematics proficiency at Herbert Hoover Elementary School, Alaska* (Doctoral dissertation). Retrieved from ProQuest: Northeastern University. (Publication No. 10248878).

Jou, M., Lin, Y. T., & Wu, D. W. (2016). Effect of a blended learning environment on student critical thinking and knowledge transformation. *Interactive Learning Environments, 24*(6), 1131–1147.

Karpicke, J. D., Butler, A. C., & Roediger III, H. L. (2009). Metacognitive strategies in student learning: Do students practise retrieval when they study on their own? *Memory, 17*(4), 471—479.

Ketonen, L., Lehesvuori, S., Pöysä, S., Pakarinen, E., & Lerkkanen, M.-K. (2022). Teacher and student teacher views of agency in feedback. *European Journal of Teacher Education,* 1–16.

Khachikian, C. S., Guillaume, D. W., & Pham, T. K. (2011). Changes in student effort and grade expectation in the course of a term. *European Journal of Engineering Education, 36*(6), 595—605.

Kibler, R. J., Cegala, D. J., Watson, K. W., Barkel, L. L., & David, T. M. (1981). *Objectives for instruction and evaluation*. New York, NY: Allyn and Bacon Publishing.

Kiewra, K. A. (2002). How classroom teachers can help students learn and teach them how to learn. *Theory into Practice, 41*, 71–80.

Kistner, S., Rakoczy, K., Otto, B., Dignath-van Ewijk, C., Büttner, G., & Klieme, E. (2010). Promotion of self-regulated learning in classrooms: Investigating frequency, quality, and consequences for student performance. *Metacognition and Learning, 5*(2), 157–171.

Kitsantas, A., Reiser, R. A., & Doster, J. (2004). Developing self-regulated learners: Goal setting, self-evaluation, and organizational signals during acquisition of procedural skills. *The Journal of Experimental Education, 72*(4), 269–287.

Kitsantas, A., & Zimmerman, B. J. (1998). Self-regulation of motoric learning: A strategic cycle view. *Journal of Applied Sport Psychology, 10*, 220–239.

Kleber, J. (2015). Differentiation through blended learning. *Leadership*, *44*(3), 20–24.

Knowles, A., & Cooner, T. S. (2016). International collaborative learning using social media to learn about social work ethics and social media. *Social Work Education, 35*(3), 260–270.

Koo, M., & Fishbach, A. (2014). Dynamics of self-regulation: How (un)accomplished goal actions affect motivation. *Motivation Science, 1*(S), 73–90.

Lai, P. & Biggs, J. (1994). Who benefits from mastery learning? *Contemporary Educational Psychology, 19*, 13–23.

Lalley, J. P., & Gentile, J. R. (2009). Classroom assessment and grading to ensure mastery. *Theory Into Practice, 48*, 28–35.

Lan, W. (2005). Self-monitoring and its relationship with educational level and task importance. *Educational Psychology, 25*(1), 109–127.

Levy, B. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personal and Social Psychology, 71*(6), 1092–1107.

Lin, J. (2019). The impact of team-based learning on students with different self-regulated learning abilities. *Journal of Computer Assisted Learning, 35*(6), 758–768.

Li, S., & Wang, W. (2022). Effect of blended learning on student performance in K-12 settings: A meta-analysis. *Journal of Computer Assisted Learning, 38*(5), 1254—1272.

Loyens, S., Magda, J., & Rikers, R. (2008). Self-directed learning in problem-based learning and its relationships with self-regulated learning. *Educational Psychology Review, 20*(4), 411–427.

Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology, 79*(3), 381–391.

MacIntyre, P. D., & Vincze, L. (2017). Positive and negative emotions underlie motivation for L2 learning. *Studies in Second Language Learning and Teaching, 7*(1), 61—88.

Maeng, J. L. (2016). Using technology to facilitate differentiated high school science instruction. *Research in Science Education, 47*(5), 1075–1099.

Malacapay, M. (2019). Differentiated instruction in relation to pupils' learning style. *International Journal of Instruction, 12*(4), 625–638.

Marino, T. A. (2000). Leaning on-line: A view from both sides. *The National Teaching and Learning Forum, 9*(4), 4–6.

Martinez, V., Mon, M., Alvarez, M., Fueyo, E., & Dobarro, A. (2020). e-Self-assessment as a strategy to improve the learning process at university. *Education Research International, 8*, 1–9.

Martin, J., Mithaug, D., Cox, P., Peterson, L., Van Dycke, J., & Cash, M. (2003). Increasing self-determination: Teaching students to plan, work, evaluate, and adjust. *Exceptional Children, 69*(4), 431–447.

Marzano, R. J. (2007). *The art and science of teaching*. Alexandria, VA: ACSD.

Matamoros, A. B. (2016). Differentiated instruction in information literacy courses in urban universities: How flipping the classroom can transform a course and help reach all students. *Urban Library Journal, 22*(1), 1–28.

Matlin, M. W. (1994). *Cognition*. Fort Worth, TX: Harcourt Brace College Publishers.

Mayer, B., Ring, C., Muche, R., Rothenbacher, D., & Schmidt-Strassburger, U. (2015). Creating a blended learning module in an online master study programme in oncology. *Education for Health (Abingdon, England), 28*(1), 101–105.

Mbah, A. K., & Paothong, A. (2015). Shapiro–Francia test compared to other normality test using expected p-value. *Journal of Statistical Computation and Simulation, 85*(15), 3002–3016.

McConnell, M. (1999). Self-monitoring, cueing, and managing: Teaching students to manage their own behavior. *Teaching Exceptional Children*, *32*(2), 14–21.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Washington, DC: U.S. Department of Education, Office of Planning, Evaluation, and Policy Development. Retrieved from http://eric.ed.gov/?id=ED505824.

Megele, C. (2015). eABLE: Embedding social media in academic curriculum as a learning and assessment strategy to enhance students learning and e-professionalism. *Innovations in Education and Teaching International, 52*(4), 414–425.

Melton, B., Graf, H., & Chopak-Foss, J. (2009). Achievement and satisfaction in blended learning versus traditional general health course designs. *International Journal for the Scholarship of Teaching & Learning, 3*(1), 1–13.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.

Mertler, C. A. (2017). *Action research communities: Professional learning, empowerment, and improvement through collaborative action research*. Routledge. London, UK.

Mertler, C. A. (2020). *Action research: Improving schools and empowering educators* (6th ed.). Thousand Oaks, CA: Sage.

Meyers, R., Pignault A., & Houssemand, C. (2013). The role of motivation and self-regulation in dropping out of school. *Procedia - Social and Behavioral Sciences, 89*, 270–275.

Miller, K. E., & Niemi, K. A. (1995). Gifted and talented: Fourth-, fifth-, and sixth-grade students' evaluations of a gifted program. *The Journal of Genetic Psychology, 156*(2), 167—174.

Minnesota Department of Education. (2020). *Multi-tiered systems of support (MTSS)*. Retrieved from https://education.mn.gov/MDE/dse/mtss/

Mishkind, A. (2014). Overview: State definitions of college and career readiness. *College and Career Readiness and Success Center.*

Monem, & Cramer, E. D. (2022). Utilizing action research to integrate curriculum, instruction, and assessment in middle school classrooms. *Middle School Journal, 53*(3), 5–14.

Moos, D., & Ringdal, A. (2012). Self-regulated learning in the classroom: A Literature Review on the teacher's role. *Education Research International,* 2012, 1–15.

Morgan, D. (1988). *Focus groups as qualitative research.* London, UK: Sage.

Morgan, D. (2014). *Integrating qualitative and quantitative methods: A pragmatic approach.* Thousand Oaks, CA: Sage.

Morphew, J. W., Silva, M., Herman, G., & West, M. (2020). Frequent mastery testing with second-chance exams leads to enhanced student learning in undergraduate engineering. *Applied Cognitive Psychology*, *34*(1), 168–181.

Newman, R. S. (2002). How self-regulated learners cope with academic difficulty: The role of adaptive help seeking. *Theory Into Practice, 41*, 132–138.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199–218.

Nilson, L. B. (2013). *Creating self-regulated learners: Strategies to strengthen students' self-awareness and learning skills.* Sterling, VA: Stylus Publishing.

Ní Uigín, D., & Cofaigh, É. Ó. (2021). Blending learning - from niche to norm. *Irish Educational Studies, 40*(2), 227–233.

Oliver, M., & Trigwell, K. (2005). Can 'blended learning' be redeemed? *E-learning and Digital Media, 2*(1), 17–26.

Onah, D., Pang, E., & Sinclair, J. (2020). Cognitive optimism of distinctive initiatives to foster self-directed and self-regulated learning skills: A comparative analysis of conventional and blended-learning in undergraduate studies. *Education and Information Technologies, 25*, 4365–4380.

Pace, J., & Mellard, D. F. (2016). Reading achievement and reading efficacy changes for middle school students with disabilities through blended learning instruction. *Journal of Special Education Technology, 31*(3), 156–169.

Palardy, J. M. (1987). Mastery learning: A mixed view. *Education, 107*(4), 424–427.

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology, 8*, 422.

Pape, S. J., Zimmerman, B. J., & Pajares, M. F. (2002). *Becoming a self-regulated learner*. Columbus, OH: The Ohio State University Press.

Paris, S. J., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist, 36*, 89–101.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Perrow, M. (2017). Strengthening the conversation in blended and face-to face courses: Connecting online and in-person learning with crossover protocols. *College Teaching, 65*(3), 97–105.

Peshkin, A. (1988). In search of subjectivity: One's own. *Educational Researcher, 17*(7), 17–21.

Picciano, A. (2009). Blending with purpose: The multimodal model. *Journal of the Research Center for Educational Technology, 5*(1), 4–14.

Pilling-Cormick, J., & Garrison, D. (2007). Self-directed and self-regulated learning: Conceptual links. *Canadian Journal of University Continuing Education, 33*(2), 13–33.

Pintrich, P. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Ziedner (Eds.), *Handbook of self-regulation*, (pp. 452–502). San Diego, CA: Academic Press.

Pintrich, P., & De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33–40.

Pintrich, P., Marx, R.W., & Boyle, R.A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research, 63*, 167–199.

Pintrich, P., Smith, D., Garcia, T., & McKeachie, W. (1991). *A manual for the use of the motivated strategies for learning questionnaire (MSLQ).* Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning.

Ponizovsky-Bergelson, Y., Dayan, Y., Wahle, N., & Roer-Strier, D. (2019). A qualitative interview with young children: What encourages or inhibits young children's participation?. *International Journal of Qualitative Methods, 18*, 1—9.

Prescott, J. E., Bundschuh, K., Kazakoff, E. R., & Macaruso, P. (2018). Elementary school-wide implementation of a blended learning program for reading intervention. *Journal of Educational Research, 111*(4), 497–506.

Pressley, M. P., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Cambridge, MA: Brookline Books.

Rafferty, L. A. (2010). Step-by-step: Teaching students to self-monitor. *Teaching Exceptional Children, 43*(2). 50–58.

Raska, D. (2014). Excited, proud, and accomplished: Exploring the effects of feedback supplemented with web-based peer benchmarking on self-regulated learning in marketing classrooms. *Journal of Marketing Education, 36*(3), 258–271.

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. *Journal of Statistical Modeling and Analytics, 2*(1), 21–33.

Reinhardt, H. (2017). [redacted] *school district #531 enrollment projections*. Retrieved from https://drive.google.com/file/d/1YOtCy85eQh0qZUJoHdcVHoF_wKEKG6tO/view

Rogers, K. B. (2007). Lessons learned about educating the gifted and talented: A synthesis of the research on educational practice. *Gifted Child Quarterly, 51*, 382—396.

Roth, A., Ogrin, S., & Schmitz, B. (2016). Assessing self-regulated learning in higher education: A systematic literature review of self-report instruments. *Educational Assessment, Evaluation and Accountability, 28*(3), 225–250.

Ryan, S., Kaufman, J., Greenhouse, J., She, R., & Shi, J. (2016). The effectiveness of blended online learning courses at the community college level. *Community College Journal of Research and Practice, 40*(4), 285—298.

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Los Angeles, LA: Sage Publishing.

Sanderson, H. W. (1976). Student attitudes and willingness to spend time in unit mastery learning. *Research in the Teaching of English, 10*(2), 191–198.

Sanguras, L. Y. (2021). Blended learning: A new frontier of differentiated curriculum. In *Modern curriculum for gifted and advanced academic students* (pp. 237-247). New York, NY: Routledge.

Sari, R. N., & Amalia, A. V. (2021). The effectiveness of blended learning using Moodle on student independence and learning outcomes. *Journal of Environmental and Science Education, 1*(1), 1—7.

Saunders, J. M. (2014). *The flipped classroom: Its effect on student academic achievement and critical thinking skills in high school mathematics* (Doctoral dissertation). Retrieved from ProQuest: Liberty University. (Publication No. 3645482).

Say, F. S., & Yıldırım, F. S. (2020). Flipped classroom implementation in science teaching. *International Online Journal of Education & Teaching, 7*(2), 606–620.

Scarlett, M. H. (2018). "Why did I get a c?" Communicating student performance using standards-based grading. *InSight: A Journal of Scholarly Teaching, 13*, 59–75.

Schechter, R., Macaruso, P., Kazakoff, E. R., & Brooke, E. (2015). Exploration of a blended learning approach to reading instruction for low SES students in early elementary grades. *Computers in the Schools, 32*(3-4), 183–200.

Schellings, G. L. M., & Broekkamp, H. (2011). Signaling task awareness in think-aloud protocols from students selecting relevant information from text. *Metacognition and Learning, 6*(1), 65–82.

Schunk, D. H., & Ertmer, P. A. (2005). Self-regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–650). Burlington, MA: Elsevier.

Schunk, D. H., & Greene, J. A. (2018). *Handbook of self-regulation of learning and performance* (2nd ed.). New York, NY: Routledge.

Schunk, D. H. (2012). *Learning theories: An educational perspective* (6th ed.). London, UK: Pearson.

Sears, C. R., Boyce, M. A., Boon, S. D., Goghari, V. M., Irwin, K., & Boyes, M. (2017). Predictors of student satisfaction in a large psychology undergraduate program. *Canadian Psychology, 58*(2), 148—160.

Servos, U., Reiß, B., Stosch, C., Karay, Y., & Matthes, J. (2023). A simple approach of applying blended learning to problem-based learning is feasible, accepted and does not affect evaluation and exam results—a just pre-pandemic randomised controlled mixed-method study. *Naunyn-Schmiedeberg's Archives of Pharmacology, 396*(1), 139–148.

Shakeel, S., Haolader, M. F. A., & Sultana, M. S. (2023). Exploring dimensions of blended learning readiness: Validation of scale and assessing blended learning readiness in the context of TVET Bangladesh. *Heliyon, 9*(1), 1–17.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63–75.

Sherr, G., Akkaraju, S., & Atamturktur, S. (2019). Nudging students to succeed in a flipped format gateway biology course. *Journal of Effective Teaching in Higher Education, 2*(2), 57–69. https://doi.org/10.36021/jethe.v2i2.51

Shimabukuro, S. M., & Prater, M. A. (1999). The effects of self-monitoring of academic performance on students with learning disabilities and ADD/ADHD. *Education & Treatment of Children (West Virginia University Press), 22*(4), 397–415.

Shuell, T. J. (1986). Cognitive conceptions of learning. *Review of Educational Research, 56*(4), 411–436.

Shy, W., & Chen, C. (2018). Designing a technology-enhanced flipped learning system to facilitate students self-regulation and performance. *Journal of Computer Assisted Learning, 34*, 53–62.

Slavin, R. E. (1987). Mastery learning reconsidered. *Review of Educational Research, 57*, 175–213.

Smallhorn, M. (2017). The flipped classroom: A learning model to increase student engagement not academic achievement. *Student Success, 8*(2), 43–53.

Smith, J. G., & Suzuki, S. (2015). Embedded blended learning within an algebra classroom: A multimedia capture experiment. *Journal of Computer Assisted Learning, 31*(2), 133–147.

Sockalingam, N. (2013). The Relation between student satisfaction and student performance in blended learning curricula. *International Journal of Learning: Annual Review, 18*(12), 121–134.

So, H. J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers and Education, 51*(1), 318–336.

Stevens, M. (2016). Space for all: Middle level students in blended learning environments. *Voices from the Middle, 24*(2) 50.

Stover, K., Yearta, L., & Harris, C. (2016). Formative assessment in the digital age. *Reading Teacher, 69*(4), 377–381.

Streiner, D. L., & Norman, G. R. (2011). Correction for multiple testing: is there a resolution?. *Chest, 140*(1), 16–18.

Swan, B., Coulombe-Quach, X.-L., Huang, A., Godek, J., Becker, D., & Zhou, Y. (2015). Meeting the needs of gifted and talented students. *Journal of Advanced Academics, 26*(4), 294–319.

Swanson, D. H., & Denton, J. J. (1977). Learning for mastery versus personalized system of instruction: A comparison of remediation strategies with secondary school chemistry students. *Journal of Research in Science Teaching, 14*(6), 515–524.

Sweller, J. (2011, June). Cognitive load theory and e-learning. *In International Conference on Artificial Intelligence in Education* (pp. 5-6). Springer, Berlin, Heidelberg.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation, 27*(2), 237–246.

Tomlinson, C. A. (2008). The goals of differentiation. *Educational Leadership*, *66*(3), 26–30.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., Conover, L. A., & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal of the Education of the Gifted, 27*, 119–145.

Tomlinson, C. A., & Moon, T. R. (2013). *Assessment and student success in a differentiated classroom*. Alexandria, VA: ASCD.

Tracy, S. J. (2020). *Qualitative research methods: Collecting experience, crafting analysis, communicating impact* (2nd ed.). Hoboken, NJ: Wiley Blackwell.

Trammel, D. L., Schloss, P. J., & Alper, S. (1994). Using self-recording, evaluation, and graphing to increase completion of homework assignments. *Journal of Learning Disabilities, 27*(2), 75–81.

Trudel, R., Murray, K. B., Kim, S., & Chen, S. (2015). The impact of traffic light color-coding on food health perceptions and choice. *Journal of Experimental Psychology. Applied, 21*(3), 255–275. https://doi.org/10.1037/xap0000049

Truitt, A. A., & Ku, H.-Y. (2018). A case study of third grade students' perceptions of the station rotation blended learning model in the United States. *Educational Media International, 55*(2), 153–169.

Tsai, C. (2011). Achieving effective learning effects in the blended course: A combined approach of online self-regulated learning and collaborative learning with initiation. *Cyberpsychology, Behavior, and Social Networking, 14*(9), 505–510.

United States Census Bureau. (2019). *QuickFacts [redacted] City, Minnesota*. Retrieved from https://www.census.gov/quickfacts[redacted]ityminnesota

U.S. Department of Education. (2020). *Every student succeeds act (ESSA)*. Retrieved from https://www.ed.gov/essa?src=rn

Uz, R., & Uzun, A. (2018). The influence of blended learning environment on self-regulated and self-directed learning skills of learners. *European Journal of Educational Research, 7*(4), 877–886.

Valiandes, S., & Neophytou, L. (2018). Teachers' professional development for differentiated instruction in mixed-ability classrooms: Investigating the impact of a development program on teachers' professional learning and on students' achievement. *Teacher Development, 22*(1), 123–138.

Van Laer, S., & Elen, J. (2017). In search of attributes that support self-regulation in blended learning environments. *Education Informational Technology, 22*, 1395–1454.

Wachanga, S. W., & Gamba, P. (2004). Effects of mastery learning approach on secondary school students' achievement in chemistry in Nakuru district, Kenya. *Egerton Journal, 5*(2), 221–235.

Wahyuni, E. (2018). Improving students' independence and collaboration with blended learning. *2018 3rd International Conference on Education, Sports, Arts and Management Engineering*. 613—616.

Wang, Z., Bergin, C., & Bergin, D. A. (2014). Measuring engagement in fourth to twelfth grade classrooms: The Classroom Engagement Inventory. *School Psychology Quarterly, 29*(4), 517–535.

Wambugu, P. W., & Changeiywo, J. M. (2008). Effects of mastery learning approach on secondary school students' physics achievement. *Eurasia Journal of Mathematics, Science, & Technology Education, 4*(3), 293–302.

Watson, J. (2008). Blended learning: The convergence of online and face-to-face education. Promising Practices in Online Learning. *North American Council for Online Learning.*

Weller, L., & Livingston, R. (1988). Effect of color of questionnaire on emotional responses. *The Journal of General Psychology, 115*(4), 433—440.

Welsh, M. E., D'Agostino, J. V., & Kaniskan, B. (2013). Grading as a reform effort: Do standards-based grades converge with test scores? *Educational Measurement: Issues and Practice, 32*(2), 26–36.

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (2017). Students with a specific learning disability intervention report: Self-regulated strategy development. Retrieved from https://whatworks.ed.gov/

White, C. B., & Fantone, J. C. (2010). Pass–fail grading: laying the foundation for self-regulated learning. *Advances in Health Sciences Education: Theory and Practice, 15*(4), 469–477.

Wilcoxon, F. (1945). Some uses of statistics in plant pathology. *Biometrics Bulletin*, *1*(4), 41–45.

Wilkes, S., Kazakoff, E. R., Prescott, J. E., Bundschuh, K., Hook, P. E., Wolf, R., & Macaruso, P. (2020). Measuring the impact of a blended learning model on early literacy growth. *Journal of Computer Assisted Learning, 36*(5), 595—609.

Williams, N. A., Bland, W., & Christie, G. (2008). Improving student achievement and satisfaction by adopting a blended learning approach to inorganic chemistry. *Chemistry Education Research and Practice*, 9(1), 43—50.

Wilson, K., & Narayan, A. (2016). Relationships among individual task self-efficacy, self-regulated learning strategy use and academic performance in a computer-supported collaborative learning environment. *Educational Psychology, 36*(2), 236–253.

Winne, P. H. (1996). A metacognitive view of individual differences in self-regulated learning. *Learning and Individual Differences, 8*, 327–353.

Winne, P. H. (2011). A cognitive and metacognitive analysis of self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.) *Handbook of self-regulation of learning and performance* (pp. 15–32). New York, NY: Routledge.

Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 277–304). Mahwah, NJ: Lawrence Erlbaum Associates.

Winter, J. W. (2018). Performance and motivation in a middle school flipped learning course. *TechTrends: Linking Research & Practice to Improve Learning, 62*(2), 176–183.

Wolters, C. A., & Brady, A. C. (2021). College students' time management: A self-regulated learning perspective. *Educational Psychology Review, 33*(4), 1319–1351.

Wolter, C. A. & Won, S. (2018). Validity and the use of self-report questionnaires to assess self-regulated learning. In D. H. Schunk & J. A. Greene (Eds.) *Handbook of self-regulation and learning performance.* New York, NY: Routledge.

Wood, S. J., Murdoch, J. Y., & Cronin, M. E. (2002). Self-monitoring and at-risk middle school students. *Behavior Modification, 26*(5). 605–626.

Woolfolk, A. (2015). *Educational psychology* (13th ed.). London, UK: Pearson.

Yang, Q. (2021). Theory-based social and non-social engagement features in smoking cessation mobile apps: A content analysis. *International Journal of Environmental Research and Public Health, 18*(17), 1–14. https://doi.org/10.3390/ijerph18179106

Yarbro, J., Arfstrom, K. M., & McKnight, K. (2014). Extension of a review of flipped learning. *Flipped Learning Network.*

Yilmaz, K. (2011). The cognitive perspective on learning: Its theoretical underpinnings and implications for classroom practices. *The Clearing House*, 84, 204–212.

Zeni, J. (1998). A guide to ethical issues and action research. *Educational Action Research, 6*(1), 9–19.

Zeidner, M. (2014). Anxiety in education. In R. Pekrun, & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 275-298). Oxfordshire, UK: Routledge.

Zhang, A. B. (2010). The integration of mastery learning in English as a second language (ESL) instruction. *International Journal of Instructional Media, 37*(1), 91–102.

Zheng, J., Jiang, N., & Dou, J. (2020). Autonomy support and academic stress: A relationship mediated by self-regulated learning and mastery goal orientation. *New Waves - Educational Research & Development, 23*(1), 43–63.

Zhu, Y., Au, W., & Yates, G. (2016). University students' self-control and self-regulated learning in a blended course. *Internet and Higher Education, 30*, 54–62.

Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology, 11*, 307–313.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). San Diego, CA: Academic Press.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*(2). 64–70.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45*, 166–183.

Zimmerman, B. J. (2011). Motivational sources and outcomes of self-regulated learning and performance. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 49–64). New York, NY: Routledge.

Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal, 23*, 614–628.

APPENDIX A

INTERVENTION DAILY OUTLINE OF ACTIVITIES

Week	Day	Activities	ELO(s) Covered
1	Monday	• Week 1 Book Club vocab • Vocab practice	• Language
	Tuesday	• Informational text • Week 1 vocab formative	• Language • Reading Informational Text
	Wednesday	• SMTS entry: Week 1 vocab formative • Blended learning: Week 1 vocab	• Language
	Thursday	• SMTS update: Week 1 vocab • Literature • Book club discussion	• Reading Literature • Presentation of Knowledge
	Friday	• Whole class discussion	• Presentation of Knowledge
2	Monday	• Week 2 Book Club vocab • Vocab practice	• Language
	Tuesday	• Informational text • Informational text formative	• Reading Informational Text
	Wednesday	• SMTS entry: Week 2 informational text formative • Blended learning: Week 2 informational text	• Reading Informational Text
	Thursday	• SMTS update: Week 2 informational text • Literature Book club discussion	• Reading Literature • Presentation of Knowledge
	Friday	• Whole class discussion	• Presentation of Knowledge
3	Monday	• Week 3 Book Club vocab • Vocab practice	• Language
	Tuesday	• Informational text	• Reading Informational Text

	Wednesday	• Literature • Literature formative	• Reading Literature
	Thursday	• SMTS entry: Week 3 literature formative • Blended learning: Week 3 literature • Book club discussion	• Reading Literature • Presentation of Knowledge
	Friday	• Whole class discussion	• Presentation of Knowledge
4	Monday	NO SCHOOL	
	Tuesday	• SMTS update: Week 3 literature formative • Informational text	• Reading Informational Text
	Wednesday	• Literature	• Reading Literature
	Thursday	• Book club discussion • Discussion formative	• Presentation of Knowledge
	Friday	• SMTS entry: Week 4 discussion formative • Blended learning: discussion	• Presentation of Knowledge
5	Monday	• Week 5 Book Club vocab • Vocab practice • Book club discussion	• Language • Presentation of Knowledge
	Tuesday	• SMTS update: Week 4 discussion • Informational text • Week 5 vocab formative	• Reading Informational Text • Language
	Wednesday	• SMTS entry: Week 5 vocab formative • Blended learning: Week 5 vocab	• Language
	Thursday	• SMTS update: Week 5 vocab • Literature • Book club discussion	• Reading Literature • Presentation of Knowledge
	Friday	• Whole class discussion	• Presentation of Knowledge
6	Monday	• Week 6 Book Club vocab • Vocab practice	• Language
	Tuesday	• Informational text • Informational text formative • SMTS entry: Week 6 informational text formative	• Reading Informational Text
	Wednesday	• Blended learning: Week 6 informational text formative	• Reading Informational Text
	Thursday	• SMTS update: Week 6 informational text • Literature	• Reading Literature

		• Book club discussion	• Presentation of Knowledge
	Friday	• Whole class discussion	• Presentation of Knowledge

APPENDIX B

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE WITH ADAPTED SCALES

The following scales and items represent the Motivated Strategies for Learning Questionnaire (MSLQ) that was used in this study to measure students' motivational beliefs and self-regulated learning. The numbers next to the items reflect the item's actual position on the questionnaire. Items marked (*R) were reflected before scale construction. There were 56 items on the questionnaire, but only 44 were used in this study to form the following five scales.

Motivational Beliefs

A. Self-Efficacy

2. Compared with other students in this class I expect to do well.
7. I'm certain I can understand the ideas taught in this course.
10. I expect to do very well in this class.
11. Compared with others in this class, I think I'm a good student.
13. I am sure I can do an excellent job on the problems and tasks assigned for this class.
15. I think I will receive a good grade in this class.
20. My study skills are excellent compared with others in this class.
22. Compared with other students in this class I think I know a great deal about the subject.
23. I know that I will be able to learn the material for this class.

B. Intrinsic Value

1. I prefer class work that is challenging so I can learn new things.
5. It is important for me to learn what is being taught in this class.
6. I like what I am learning in this class.
9. I think I will be able to use what I learn in this class in other classes.
12. I often choose paper topics I will learn something from even if they require more work.
17. Even when I do poorly on a test I try to learn from my mistakes.
18. I think that what I am learning in this class is useful for me to know.
21. I think that what we are learning in this class is interesting.
25. Understanding this subject is important to me.

C. Test Anxiety

3. I am so nervous during a test that I cannot remember facts I have learned.
14. I have an uneasy, upset feeling when I take a test.
24. I worry a great deal about tests.
27. When I take a test I think about how poorly I am doing.

Self-Regulated Learning Strategies

D. Cognitive Strategy Use

30. When I study for a test, I try to put together the information from class and from the book.
31. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.
33. It is hard for me to decide what the main ideas are in what I read. (*R)
35. When I study I put important ideas into my own words.
36. I always try to understand what the teacher is saying even if it doesn't make sense.
38. When I study for a test I try to remember as many facts as I can.
39. When studying, I copy my notes over to help me remember material.
42. When I study for a test I practice saying the important facts over and over to myself.
44. I use what I have learned from old homework assignments and the textbook to do new assignments.
47. When I am studying a topic, I try to make everything fit together.
53. When I read material for this class, I say the words over and over to myself to help me remember.
54. I outline the chapters in my book to help me study.
56. When reading I try to connect the things I am reading about with what I already know.

E. Self-Regulation

32. I ask myself questions to make sure I know the material I have been studying.
34. When work is hard I either give up or study only the easy parts. (*R)
40. I work on practice exercises and answer end of chapter questions even when I don't have to.
41. Even when study materials are dull and uninteresting, I keep working until I finish.
43. Before I begin studying I think about the things I will need to do to learn.
45. I often find that I have been reading for class but don't know what it is all about. (*R)
46. I find that when the teacher is talking I think of other things and don't really listen to what is being said. (*R)
52. When I'm reading I stop once in a while and go over what I have read.
55. I work hard to get a good grade even when I don't like a class.

Received July 13, 1988
Revision received July 7, 1989
Accepted September 12, 1989 ■

APPENDIX C

STUDENT ENGAGEMENT AND EXPERIENCE INVENTORY

Part A. Rate yourself on each of the following statements by selecting the statement that best represents you.

During blended learning intervention time…					
1. I felt interested.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
2. I felt proud.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
3. I felt excited.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
4. I felt happy.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
5. I felt amused (smile, laugh, have fun).	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
6. I got really involved in collaborative activities	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
7. I formed new questions in my mind as I worked.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
8. I did not want to stop working with my group.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
9. I actively participated in class discussion posts.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
10. I worked with other students and we learned from each other.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
11. I "zoned out," not really thinking or doing class work	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
12. I let my mind wander	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**
13. I just pretended like I was working.	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Always**

Part B. Rate your agreement with each of the following statements by selecting the statement that is most true of you.

14. Using the SMTS motivates me to complete all of the items in the time allowed.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
15. Using the SMTS helps me to see how well I am doing over time.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
16. Using the SMTS motivates me to do my best to answer all of the items correctly.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
17. Using the SMTS is a good use of my time.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
18. Using the SMTS helps me understand what I need to work on.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
19. Using the SMTS challenges me to change the way I do things when I see a problem I have struggled with in the past.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
20. Using the SMTS helps me to learn from my mistakes.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
21. Using the SMTS helps me to pay attention to what I'm doing.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
22. Using the SMTS helps me keep track of my progress and rewards me as I progress toward my goals.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
23. Using the SMTS helps me to find several different possibilities when I want to change something.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
24. Using the SMTS helps me to pay attention to what I'm doing.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
25. Using the SMTS motivates me to think before I act.	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**

APPENDIX D

FOCUS GROUP INTERVIEW PROTOCOL

Hello, and thank you for agreeing to participate in this study. You may choose to stop participating in this study at any time during the interview. This interview should take us about 20 minutes, during which I will ask you all several questions. I want to make you aware that our time together is being recorded so I have a way to recall what was shared. I will also be taking written notes in order to be as accurate as possible in my data collection. Before we begin, I will review with you the purpose of my study. The purpose of this research is to determine how using the SMTS and blended learning intervention time affected your self-regulated learning skills, your academic performance in this class, and your overall experience in this class. Do you have any questions before we begin?

I will first ask you some questions about your experience with the blended learning intervention time. As a reminder, this blended learning intervention time was presented to you with a Google Slides presentation that had different directions and activities embedded within it. In your answers, feel free to be as honest as possible about your experiences and opinions. You will not hurt my feelings if you have a negative experience or opinion to share. Do you have any questions about what the blended learning intervention time is before I ask these questions? If you need clarification at any point, please ask.

1. Can you share with me some ways that the blended learning intervention time impacted your existing learning strategies?
2. What were your overall opinions about the blended learning intervention time?
    1. Can you tell me more about _____?
3. Share with me what you found to be the best parts of the blended learning intervention time.
4. Tell me what were the worst parts of the blended learning intervention time.

I will now ask you some questions about your experience with the SMTS. As a reminder, the SMTS was the Google Sheets tracking document that you filled out after completing assignments in class. In your answers, feel free to be as honest as possible about your experiences and opinions. You will not hurt my feelings if you have a negative experience or opinion to share. Do you have any questions about what the SMTS is before I ask these questions? If you need clarification at any point, please ask.

5. Can you share with me some ways that using the SMTS might have impacted how you plan your existing learning strategies?
6. What were your overall opinions about using the SMTS?
a. Can you tell me more about _____?
7. Share with me what you found to be the best parts of using the SMTS.
8. Tell me what were the worst parts of using the SMTS.

That is the end of this interview. Thank you for your participation. Do you have any questions or further thoughts you would like to share? My next steps will be to transcribe this interview to analyze. I will check in with you to ensure that my transcription and analysis accurately reflects your thoughts and experiences.

APPENDIX E

PARTICIPANT CONSENT AND ASSENT FORM

UNIVERSITY OF SOUTH CAROLINA

CONSENT TO BE A RESEARCH SUBJECT

EFFECTS OF A SELF-MONITORING TRACKING SYSTEM COMBINED WITH BLENDED LEARNING INTERVENTION TIME ON STUDENTS' SELF-REGULATED LEARNING AND ACADEMIC PERFORMANCE

If participants include those under 18 years of age: 1) The subject's parent or legal guardian will be present when the informed consent form is provided. 2) The subject will be able to participate only if the parent or legal guardian provides permission and the adolescent (age 13-17) provides his/her assent. 3) In statements below, the word "you" refers to your child or adolescent who is being asked to participate in the study.

KEY INFORMATION ABOUT THIS RESEARCH STUDY:
You are invited to volunteer for a research study conducted by Jennifer Augustine. I am a doctoral candidate in the Department of Education, at the University of South Carolina. The University of South Carolina, Department of Education is sponsoring this research study. The purpose of this study is to evaluate the effects of the implementation of weekly blended learning interventions combined with a self-monitoring achievement system on students' self-regulated learning skills. You are being asked to participate in this study because you are a student in the class in which this study will take place. This study is being done at [redacted] Middle School and will involve approximately 90 volunteers.

The following is a short summary of this study to help you decide whether to be a part of this study. More detailed information is listed later in this form.

PROCEDURES:
If you agree to participate in this study, you will do the following:
1. Complete a questionnaire that will measure Self-Regulated Learning Skills (MSLQ). This survey will be given once at the beginning of the year and again later in the semester.
2. Complete a survey that will measure your engagement and satisfaction with the tracking system and blended learning used in class.

3. Participate in standard classroom activities (lessons, group work, assessments, etc.)
4. Use a tracking document in class to track your individual progress in my class.
5. Use short digital learning activities (blended learning) to receive instruction at appropriate levels.
6. Be observed by the teacher while using the tracking document and while participating in blended learning.
7. A small number of students will be selected to be interviewed about their experience using the tracking document and blended learning.

DURATION:
Participation in the study will begin at the start of the school year and end during the second semester of the school year.

RISKS/DISCOMFORTS:
Focus Group Interviews:
A small number of students will be asked to participate in focus group interviews. Others in the group will hear what you say, and it is possible that they could tell someone. The researcher cannot guarantee what you say will remain completely private, but the researchers will ask that you, and all other group members, respect the privacy of everyone in the group. Aside from this, there are no foreseeable risks to participating in this study. The teaching practices being tested are supported by research. All data collected will be unidentifiable and students' personal information and names will not be disclosed.

BENEFITS:
All students in the class may receive educational benefits by being provided with research-based instructional practices, regardless of their participation in data collection. If participating in this study, you may also learn about how you use learning strategies, how often you are reassessing and extending on assignments, and your overall academic performance, which may be useful information for you better understand your own learning behaviors and performance.

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

PAYMENT TO PARTICIPANTS:
You will not be paid for participating in this study.

COLLECTION OF IDENTIFIABLE PRIVATE INFORMATION OR IDENTIFIABLE BIOSPECIMENS:
Information about you may be used for future research studies or may be shared with other researchers; however, this only will be done after identifiers linking the information to you are removed. This will be done without additional consent from you.

CONFIDENTIALITY OF RECORDS:
Information obtained about you during this research may be published, but you will not be identified. Information that is obtained concerning this research that can be identified with you will remain confidential to the extent possible within State and Federal law. The investigators associated with this study, the sponsor, and the Institutional Review Board will have access to identifying information. All records in South Carolina are subject to subpoena by a court of law. Study information will be securely stored in locked files and on password-protected computers.

VOLUNTARY PARTICIPATION:
Participation in this research study is voluntary. You are free not to participate, or to stop participating at any time, for any reason without negative consequences. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner. If you wish to withdraw from the study, please call or email the principal investigator listed on this form.

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. **If I have any more questions about my participation in this study, or a study related injury, I am to contact Jennifer Augustine at [redacted] or email [redacted]**

Concerns about your rights as a research subject are to be directed to, Lisa Johnson, Assistant Director, Office of Research Compliance, University of South Carolina, 1600 Hampton Street, Suite 414D, Columbia, SC 29208, phone: (803) 777-6670 or email: LisaJ@mailbox.sc.edu.

I agree to participate in this study. I have been given a copy of this form for my own records. If you wish to participate, you should sign below.

Signature of Minor Subject / Participant	Date
Signature of Parent/Guardian	Date

APPENDIX F

SCHOOL PRINCIPAL RESEARCH APPROVAL

[redacted] Apps

Jennifer [redacted]

Ed.D. Study Approval

[redacted] Thu, Apr 28, 2022 at 8:43 AM

Jennifer,

Along with Dr. [redacted], I grant permission to run your intended research project. Thank you for your close attention to student confidentiality practices. I look forward to seeing the results of your study.

[redacted]
[redacted] Middle School Principal
Work: [redacted]

Learn--Share--Innovate--Inspire

APPENDIX G

SCHOOL SUPERINTENDANT RESEARCH APPROVAL

Learn. Share. Innovate. Inspire.

April 27, 2022

Dear Mrs. Augustine:

The [redacted] Public School District has considered your proposal to conduct research for your project titled: "*Effects of a Self-monitoring Tracking System Combined with Blended Learning Intervention Time on Students' Self-regulated Learning and Academic Performance"*. That recommendation has been supported by district leadership.

The [redacted] Public School District carefully considers research proposals. Only those requests that are determined to be of value to the school district, that do not interfere with the educational programs of the district, and that respect the privacy and due process rights of students and employees are approved.

Your interest in this topic is commendable, and I would like to inform you that your research request has been approved. Please remember that the principal at the school involved in your research must give approval before you begin your study. Administrators in the [redacted] Public School District recognize the value of your research and wish you success in your project.

Best regards,

[redacted]
Superintendent - [redacted] Public Schools

APPENDIX H

UNIVERSITY INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH
DECLARATION of NOT RESEARCH

Jennifer Augustine
2835 17th Ave NW
Rochester, MN 55901-7768

Re: **Pro00120734**

Dear Jennifer Augustine:

This is to certify that research study entitled ***Effects of a Self-monitoring Tracking System Combined with Blended Learning Intervention Time on Students' Self-regulated Learning and Academic Performance*** was reviewed on **5/4/2022** by the Office of Research Compliance, which is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). The Office of Research Compliance, on behalf of the Institutional Review Board, has determined that the referenced research study is not subject to the Protection of Human Subject Regulations in accordance with the Code of Federal Regulations 45 CFR 46 et. seq.

No further oversight by the USC IRB is required. However, the investigator should inform the Office of Research Compliance prior to making any substantive changes in the research methods, as this may alter the status of the project and require another review.

If you have questions, contact Lisa M. Johnson at lisaj@mailbox.sc.edu or (803) 777-6670.

Sincerely,

Lisa M. Johnson
ORC Associate Director and IRB Manager

APPENDIX I

QUALITATIVE THEME DEVELOPMENT

Theme	Category	Code	Participant Quotations
Theme 1: Students increased their ownership of learning through self-awareness of successful learning strategies and independence.	Self-awareness	• *Aware* • *Knowing* • *"You know what you need to work on"*	"I needed to read more carefully and try and connect more things and questions to the article with the answers."
	Reflection about Learning Strategies	• *Looking over notes* • *Practicing*	"Planning on paper."
	Reflection Produced Ownership and Agency of the Learning Process	• *Reviewing*	"I don't really like sharing but I practiced in my head before I said something."
	Self-efficacy and Awareness of Needing Help	• *Confident* • *Asking questions*	"Ask the teacher about it and ask to reword it to me."
Theme 2: The combination of the SMTS and blended learning motivated students during class and gave them the ability to improve their grades with less stress.	Opportunity to Improve Academically	• *Advancing* • *Upgrading*	"Getting better"
	Students Being Motivated to Improve their Scores	• *Determined* • *Fired up*	"It's hard to see sometimes when you click on something and it's yellow or red."
	Blended Learning Time Reducing Students' Stress about Grades	• *Relaxed* • *Calm*	"There's not as much stress."
Theme 3: The SMTS gave students an active and visual tool to track their progress, allowing them to see their grades as a learning instrument and to feel accomplished.	SMTS as an Assistive Tool in Recognizing Accomplishments	• *Checking off* • *Accomplishing*	"You actually feel like you've changed something today."
	Value of SMTS as a Tracking and Monitoring Tool	• *Tracking* • *"I love the colors."*	"I think it's a great way to like visually see how you've been doing and how you've progressed."