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# THE IMPACT OF ONLINE INSTRUCTION ON FOURTH GRADE STUDENTS' READING SELF-EFFICACY AND ACHIEVEMENT

Chad E. Wickard

*Olivet Nazarene University*, [chadwickard@gmail.com](mailto:chadwickard@gmail.com)

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THE IMPACT OF ONLINE INSTRUCTION ON FOURTH GRADE STUDENTS'  
READING SELF-EFFICACY AND ACHIEVEMENT

by

Chad E. Wickard

Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Ethical Leadership


May 2018

THE IMPACT OF ONLINE INSTRUCTION ON FOURTH GRADE  
STUDENTS' READING  
SELF-EFFICACY AND ACHIEVEMENT

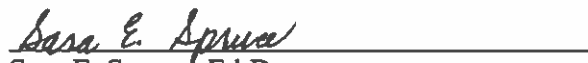
by

Chad E. Wickard


Dissertation

  
Roxanne Forgrave, Ed.D.  
Dissertation Adviser


May 5, 2018

  
Sara E. Spruce, Ed.D.  
Dissertation Reader


May 5, 2018

  
Kelly S. Brown, Ed.D.  
Dissertation Coordinator

May 5, 2018

  
Houston Thompson, Ed.D.  
Program Director

May 5, 2018

  
Carol Summers, Ed.D.  
Vice President for Academic Affairs

May 5, 2018

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## ABSTRACT

This quantitative, quasi-experimental study examined fourth grade students' relationships between self-efficacy and reading achievement as mediated by an online instructional delivery system called MobyMax® over time between a pretest and a posttest. The researcher also investigated sources of self-efficacy in four areas (process accomplishments or mastery experiences, vicarious experience, verbal persuasion, and physiological states). Finally, the study compared the efficacy and achievement relationships across gender and ethnicity (White, Black, Hispanic, and other). Statistical Package for the Social Sciences (SPSS) was used to organize the data using a mixed factorial ANOVA to analyze the impact of the interventions and time factor on reading self-efficacy and reading achievement. A multiple regression was used to calculate the individual contribution of the four sources of self-efficacy on reading achievement. *T*-tests were used to calculate the mean differences across gender, and a One-way ANOVA to analyze the variance across ethnicities. The mean differences between males and females in reading achievement on both the pretest as well as the posttest were statistically significant (Pretest,  $t(66.23) = 3.07, p < .01, d = .53$ , Posttest,  $t(68.92) = 2.57, p < .02, d = .44$ ). All other findings were not statistically significant. The MobyMax® intervention did not make a statistically significant difference, positive or negative, in reading achievement or self-efficacy. Although the current study did not reveal statistical significance related to the relationship of self-efficacy and achievement in the elementary years, other studies have; therefore, additional research needs to be conducted.

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## CHAPTER I

### INTRODUCTION

Over the last 10 years, this researcher has taught students to persevere in the pursuit of excellence and has served students from first through sixth grade who succeeded at high levels of reading, while others struggled with reading and continued to fall further behind. One barrier struggling students faced was the belief that they were unable to read at high levels with understanding. Students' self-perception or self-efficacy was low, and self-efficacy continued to decline. In turn, the students' achievement also declined, reinforcing the students' self-perception of incompetence. Keeping students from drifting into a state of despair as they fell further behind in reading continued to be the struggle. Bandura (1977) defined self-efficacy as one's willingness to expend effort even when the process is difficult and the outcome is uncertain. Additionally, results from Bandura's study identified performance accomplishments or mastery experiences, vicarious experiences, verbal persuasion, and physiological states as the four distinct sources of self-efficacy.

The present study investigated the impact of online reading instruction delivery on fourth grade students' reading self-efficacy and the variance within the individual sources of self-efficacy that contributed independently to the overall level of self-efficacy. Instruction was delivered through MobyMax®, an online instructional delivery tool, and reinforced by this researcher through progress monitoring. Research has concluded that a student's level of self-efficacy is correlated to his or her level of

achievement (Pajares & Schunk, 2002), and Archambault, Eccles, and Vida (2010) suggested that a future study focus on early interventions for students with low motivation. Mastery experience contributed more to self-efficacy than the other sources that relates directly to one's motivation to persevere (Pajares, Johnson, & Usher, 2007).

The current study focused on differences in gender related both to overall self-efficacy as well as overall reading achievement. Research has shown that mastery experiences predicted academic self-efficacy in both girls and boys while revealing differences among girls and boys with social persuasions having a greater impact on girls, and vicarious experiences having a greater impact on boys (Usher & Pajares, 2006).

The focus of this current study was on the relationship between self-efficacy and reading achievement, both in the presence of a reading intervention as well as without. Additionally, the focus was on the extent of variability across White, Black, and Hispanic students.

#### Statement of the Problem

Students' level of self-efficacy has been shown to correlate with achievement levels, such that improved levels of self-efficacy and attitude results in increased levels of achievement (Barkley, 2006). This researcher questions whether providing online reading instruction through MobyMax® increased students' overall level of reading self-efficacy and led to increased levels of reading achievement. The current study researched the correlation between the students' level of self-efficacy and the level of reading achievement as impacted by the online delivery of instruction in order to determine the extent of self-efficacy's impact on reading achievement and the differences, if any, across gender and ethnicity.

The purpose of this quantitative study was to introduce extended and purposeful online delivery of instruction using MobyMax® in order to identify the extent of MobyMax®'s effect on students' level of reading self-efficacy and the relationship to participants' reading achievement. Although MobyMax® was founded in 2011 and is used by over 15 million students nationwide, minimal independent research has been done or published validating the effectiveness of the online delivery of curricula. Representatives of MobyMax® have published information as to the research-based development of pedagogy, but this researcher uncovered no independent research as to MobyMax®'s effectiveness. The current research study contributed to the body of knowledge related to self-efficacy and the effectiveness of MobyMax®'s pedagogy on both the self-efficacy of students as well as the contributing sources from which self-efficacy is formed. In addition, a contribution was made to the body of knowledge relating to the extent of variation between each source that contributes to the increase in overall level of self-efficacy. Additionally, this research investigated the differences in self-efficacy and the extent of each contributing source related to gender and ethnicity.

### Background

Self-efficacy has been defined by Bandura (1977) as the amount of effort expended by an individual when faced with an obstacle or unfamiliar situation. In addition, the more accomplishments an individual completes, the greater the level of self-efficacy or the willingness to attempt with persistence a new task even when faced with an obstacle (Bandura). Inversely, when success was limited, self-efficacy declined. Bandura identified that self-efficacy is formed through four distinct sources identified as process accomplishments or mastery experiences, vicarious experience, verbal

persuasion, and physiological states. Phan (2012a) reported a statistically significant relationship between students' level of self-efficacy and their prior accomplishments. As found in other research work, success led to enhanced self-efficacy, while failure led to decreased levels of self-efficacy (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). In the school setting, it is important for the teacher to ensure that students are working at a level that they can be successful, and when students are placed in a situation where despite their efforts, they are unsuccessful, the students become less persistent when attempting similar assignments in the future; as a result, self-efficacy declines (Bandura, et al.; Phan).

Research into self-efficacy (Alfassi, 2003; Archambault, et al., 2010; Meece & Miller, 1997) has recommended that future studies include interventions that provided students the tools to enhance their levels of self-efficacy. Meece and Miller's research focused on the effects of a classroom intervention that used an integrated curriculum, and although they noted a limitation of not having a control group, the data analysis provided evidence of improved levels of student self-efficacy. Based on the recommendations by Meece and Miller, this researcher implemented an integrated curriculum intervention as well as a control group. Alfassi's research compared the effect of a structured academic program on students' level of self-efficacy and showed a statistically significant positive correlation between the structured academic program and the students' level of self-efficacy. In turn, the students also had increased levels of achievement. A study by Archambault et al. revealed that students' self-efficacy changed across grade levels from first grade through 12<sup>th</sup>-grade. Additionally, Archambault et al. concluded that students with low motivation or self-efficacy, especially boys, should receive targeted

interventions early in their educational careers. In order to address students' needs, an intervention was implemented during this present study that focused on improving levels of reading self-efficacy that are expected to improve in a statistically significant way as compared to the non-intervention group.

In contrast to previous research (Meece & Miller, 1997), MobyMax® was implemented as an integrated curriculum intervention and included a control group. MobyMax® was founded in 2011 and designed on research-based principles that focused on delivering curriculum emphasizing student outcomes and achievement (2X Learning, n.d.). Based on decades of educational research (2X Learning), MobyMax® is an online, educational software that was designed as an instructional delivery system and uses formative assessment that can be implemented by any teacher in a variety of ways while maintaining the integrity of results for the students (2X Learning) MobyMax® was designed to provide online curriculum, delivery, and assessment that used a mastery learning approach that provided students with timely feedback and multiple opportunities to learn and practice the desired objectives. In addition, MobyMax® delivers direct instruction with specific and targeted objectives, time to practice, and opportunities to extend the learning, while providing meaningful and immediate feedback (2X Learning). MobyMax® was assigned as the online intervention to deliver instruction with the desired result being an increase in reading self-efficacy.

Some of the research (Henk & Melnick, 1995; Joët, Usher, & Bressoux, 2011; Pajares et al., 2007) provided insights into both overall self-efficacy as well as the contributions of each of the four sources developed by Bandura (1977). The instrument used to measure self-efficacy and the four sources was developed and determined reliable

and valid by Henk and Melnick. The Reader Self-Perception Scale (RSPS) is a tool for measuring how children feel about themselves as readers and is based on the established self-efficacy sources of progress, observational comparison, social feedback, and physiological states. In the original study, the RSPS was administered to 1,479 fourth through sixth graders from diverse communities, and after further reliability and factor analysis the scale alphas ranged from .81-.84, with each category contributing equally (Henk & Melnick). Analysis of the results revealed a consistent distribution of mean and standard deviation across grade levels, and the corresponding standard errors were low resulting in a valid and reliable test.

Research (Joët et al., 2011; Pajares et al., 2007) determined, as part of the conducted research, that the four sources of self-efficacy correlate to one another as well as to the overall levels of self-efficacy. Pajares et al. found a statistically significant correlation with the four sources' contribution to overall self-efficacy in writing, while Joët et al. looked at the level of contribution of each of the four sources and discovered the most statistically significant correlation between both mastery experience (performance accomplishments) and social persuasion in math and French among third grade students. Additional research (Fast et al., 2010; Joët, et al., 2011; Karaarslan & Sungur, 2011; Pajares, et al.; Perry, Boelter, Leukefeld, & Link, 2012) included questions related to gender and ethnicity as well as the connection to self-efficacy. Karaarslan and Sungur established that self-efficacy declined across grade levels, but the results indicated no statistically significant correlation related to gender. Perry et al. found African American and Latino boys reported statistically significantly lower educational and science attitudes and aspirations than their White counterparts, while African

American and Latino girls reported equal or greater attitudes and aspirations than their White counterparts. Fast et al. studied the correlation between math self-efficacy and achievement, and discovered a statistically significant drop in math self-efficacy among female students. Pajares et al. included a question to ascertain the relationship among the four sources of self-efficacy and how each differed according to gender. Girls had higher levels of writing self-efficacy with lower anxiety (Pajares et al.). Joët et al. postulated, related to the gender question, that girls reported lower self-efficacy in each category despite having higher test scores in French.

#### Research Questions

1. To what extent is the students' overall reading self-efficacy level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
2. To what extent is the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
3. To what extent did each subscale within the RSPS—progress, observational comparison, social feedback, and physiological states—contribute to students' overall reading achievement?
4. To what extent does reading self-efficacy and reading achievement vary between male and female students?
5. To what extent does reading self-efficacy and reading achievement vary by ethnicity (including White, Black, Hispanic, and other)?



## Description of Terms

*F*. The symbol used to represent the *F*-test used for analysis of variance (ANOVA) (Yockey, 2011).

*MobyMax*®. MobyMax® is an online curriculum tool that delivers differentiated, focused instruction, practice, and assessment. MobyMax® also uses mastery learning through a cyclical approach to standards-based learning (2X Learning, n.d.).

*Observational Comparison*. Observational comparison is how a child perceives his or her reading performance to compare with the performance of classmates (Henk & Melnick, 1995).

*Performance Accomplishments*. Also, referred to as mastery experience or progress, performance accomplishments refer to a broad category that encompasses students' past performance, the amount of effort needed to accomplish a given task, the need for assistance, patterns of success or progress, the difficulty of the task, task persistence, and the students' perception or belief in the effectiveness of instruction (Henk & Melnick, 1995).

*Physiological States*. Physiological states are the internal feelings such as anxiety, fear, excitement, or anticipation that the participants experience during reading (Henk & Melnick, 1995).

*Progress*. Progress is how one's perception of current reading performance compares with former performance (Henk & Melnick, 1995).

*Self-efficacy*. Self-efficacy is a person's judgment of his or her ability to perform an activity and the effect this perception has on the on-going and future handling of the activity (Henk & Melnick, 1995).

*Self-perception.* Self-perception is one's view of himself or herself, including ability, aptitude, chance of success, etc., in each situation (Henk & Melnick, 1995).

*Social Feedback.* Also, known as verbal persuasion (Bandura, 1977), social feedback refers to direct or indirect input about reading from teachers, classmates, and other people in the child's family (Henk & Melnick, 1995).

*Vicarious experience.* Vicarious experience is living an experience through someone else or live modeling i.e. peer tutors showing other students how they solve a problem or read fluently, etc., or symbolic modeling (Bandura, 1977).

### Significance of the Study

This present study provided further insights into Bandura's (1977) research into self-efficacy as well as adding to the research a different population of participants. Joët, et al. (2011) investigated the impact and importance of self-efficacy on students' achievement in relation to gender, and although the findings showed no statistically significant variance along gender lines alone, there was a difference when comparing the individual contribution of the four sources of self-efficacy.

In addition, the use of MobyMax® as an online delivery of instruction intervention made this study unique. Limited research existed to validate the claims presented in MobyMax®'s internal research. MobyMax® provides research-based instruction across all subject areas, is aligned to the Common Core State Standards, and promotes mastery achievement (2X Learning, n.d.). Mastery learning is promoted using formative assessments and responsive corrective instruction through online tutorials, by which teachers monitor students' progress toward mastery of each standard (2X Learning). Additional insights were discovered into the use of an online instructional

delivery intervention's promotion of increased levels of reading self-efficacy, and added to the body of knowledge related to reading self-efficacy as well as reading self-efficacy's relationship to gender and ethnicity.

### Process to Accomplish

#### Participants

Participants were selected from an urban district located in a Midwestern state. Student population in this district consisted of 6,751 students with 58 per 100 students representing minorities, which is higher than the 50 per 100 represented within the state; most minority students are Black ("Public School Review," n.d.). Participants were 78 fourth-grade students (42 males, 36 females) from three classrooms in an urban, magnet-elementary school in the Midwest. The school population was drawn proportionately from each of the elementary schools across the district ("Public School Review"), and has a much lower mobility rate as compared to the district; only nine per 100 students move to another school as compared to 25 per 100 in the entire district population. Forty-four minority students and 34 Caucasian students constituted the sample of students in the current study.

#### Measures

To measure self-efficacy, participants completed the Reader Self-Perception Scale (RSPS) created by Henk and Melnick (1995). The RSPS is considered public domain, but the authors granted permission (See Appendix A) to modify the scale to administer online, but did not want the scale to be published as a part of this study except for sample questions. The RSPS contains 33 questions divided into five subscales assessing general perception with one question (e.g., I think I am a good reader.), progress with nine

questions (e.g., When I read, I don't have to try as hard as I used to.), observational comparison with six questions (e.g., I read faster than other kids.), social feedback with nine questions (e.g., My teacher thinks that my reading is fine.), and physiological states with eight questions (e.g., Reading makes me feel happy inside.) (Henk & Melnick). As mentioned earlier in this chapter, research has shown that mastery experiences (progress) predicted academic self-efficacy in both girls and boys (Usher & Pajares, 2006).

Participants responded using a 5-point Likert-type scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Participants' reading achievement was measured using the Northwest Evaluation Association Measure of Academic Progress (NWEA MAP) assessment. Used as a district level assessment, the NWEA MAP is administered to all elementary students across the district. Covering English language arts (ELA) Common Core State Standards, the MAP assessment is adaptive and contained 32-52 questions that covered Common Core reading standards, and was reported as an overall grade level equivalency score.

MobyMax®, an online learning system that provides and delivers curriculum based on national standards as well as the New Common Core Learning Standards, was the reading intervention used for this present study. The creators of MobyMax® employed the power of direct instruction by breaking down standards into clear learning objectives for students, providing instruction in the form of teach-me lessons, and presenting students with multiple experiences to practice and develop a deep understanding of specific skills while providing high-quality feedback throughout the learning process (2X Learning, n.d.).

## Procedures

Permission was provided by the school district (See Appendix B) in which the study was conducted and by the three participating classroom teachers. Participants' parents or guardians provided informed consent. Each of the three fourth-grade classes participated in a pretest, administered in August 2016 as well as a posttest in December 2016. Both sessions consisted of the administration of the RSPS to measure reading self-efficacy and to identify gender and ethnicity as well as the NWEA MAP assessment to measure reading achievement. The RSPS and demographic questions were administered using SurveyMonkey, an online survey tool, while the NWEA MAP assessment was administered using an online system designed by NWEA and adopted by the school district. In the intervening months, students in one of the three classrooms as well as six students from a partner teacher's classroom received the MobyMax® intervention; whereas, all other students did not. Permission was provided by a representative from MobyMax® to use the curriculum for the current study as well as to publish the results (See Appendix C). Students in the intervention group were assigned equal time to MobyMax®'s Reading Stories, Reading Literature Skills, and Reading Informational Skills modules at each of their reading levels. Beginning reading levels were determined using MobyMax®'s built-in assessment system. MobyMax®'s assessment system will only be used for the intervention group and will not be used to determine the final growth or reading achievement level. All participants will be given the NWEA MAP assessment in order to determine growth and final reading achievement levels.

## Research Questions

1. To what extent is the students' overall reading self-efficacy level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?

Data.

Relevant variables were the students' reading self-efficacy and the intervention condition to which they were assigned (reading intervention present vs. absent). Reading self-efficacy was measured both in August 2016 as a pretest as well as in December 2016 as a posttest using the RSPS. Online delivery of instruction through MobyMax® constituted the intervention.

Analysis.

Data were analyzed using a mixed factorial ANOVA predicting reading self-efficacy from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition. This researcher expected that the intervention group at posttest would have higher reading self-efficacy ratings.

2. To what extent is the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?

Data.

Relevant variables were the students' reading achievement scores and the intervention condition they were assigned to (reading intervention present vs. absent). Reading Achievement was measured both in August 2016 as a pretest

and in December 2016 as a posttest using the NWEA MAP assessment. Online delivery of instruction through MobyMax® constituted the intervention.

Analysis.

Analysis was conducted using a mixed factorial ANOVA predicting Reading Achievement from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition. Improved reading achievement scores were expected in the intervention group.

3. To what extent did each subscale within the RSPS—progress, observational comparison, social feedback, and physiological states—contribute to students' overall reading achievement?

Data.

For this question, a series of predictors were measured. Each predictor was calculated from the four subscales from the RSPS scale (general perception—not a subscale—progress, observational comparison, social feedback, and physiological states). Individual reading achievement growth scores constituted the outcome or dependent variable.

Analysis.

This researcher ran a single multiple regression with each subscale score from the pretest as a predictor and the reading growth as the outcome. Growth was calculated by subtracting the pretest scores from the posttest scores creating a difference score that was used as the growth. The progress subscale was expected to relate positively to students' overall reading achievement.

4. To what extent do self-efficacy and reading achievement vary between male and female students?

Data.

Measured variables included students' self-efficacy, reading achievement, and gender. Gender was measured using a single demographic question at the end of the RSPS. Reading self-efficacy was measured using the RSPS, while reading achievement was measured using the NWEA MAP assessment.

Analysis.

One *t*-test was conducted that compared mean differences of males to females on reading self-efficacy. The second compared mean differences of males to females on reading achievement.

5. To what extent do self-efficacy and reading achievement vary by ethnicity (including White, Black, Hispanic, and other)?

Data.

Measured variables included students' self-efficacy, reading achievement, and ethnicity (White, Black, Hispanic, and other). Ethnicity was measured using a single demographic question at the end of the RSPS. Reading self-efficacy was measured using the RSPS, while reading achievement was measured using the NWEA MAP assessment.

Analysis.

Two separate one-way ANOVAs were conducted. The first ANOVA predicted reading self-efficacy from ethnicity, and the second ANOVA predicted reading achievement from ethnicity.



## Summary

The current study added to the research body of knowledge related to self-efficacy and the contributing sources of self-efficacy to the participants' level of reading achievement as well as the variance across gender and ethnicity. Pajares et al., (2007) showed that mastery experience contributes to achievement above the other sources from which self-efficacy is derived, but an insufficient level of independent research existed measuring MobyMax®'s effectiveness when used as an intervention that promoted mastery experiences, and the impact on self-efficacy and reading achievement. MobyMax® was implemented as an online delivery of instruction intervention to enhance self-efficacy, and to measure the variance in the level of contribution to reading achievement by each of the four sources of self-efficacy as measured by the RSPS represented in general and across diverse ethnicities and gender. MobyMax® was created in 2011 and is used by more than 15 million registered students worldwide; however, there remains a minimal amount of independent research to validate the internal results produced by MobyMax®. Additional independent evidence was provided that assessed the effectiveness and validity of MobyMax® as an online instructional delivery system and its function as an intervention for enhancing self-efficacy and reading achievement.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Chapter two focused on the available research literature that provided the foundation, focus, and direction for this current study. Throughout the following literature review, this author presented research findings that showed the impact of self-efficacy on achievement as well as the four sources from which self-efficacy is formed. The four sources of self-efficacy are process accomplishments or mastery experiences, vicarious experience, verbal persuasion, and physiological states (Bandura, 1977). Additional research literature was reviewed that showed a wide range of academic achievement resulted from increased self-efficacy as well as self-efficacy's impact on reading achievement. Further studies (Louis & Mistele, 2012; Pajares, 2002; Pajares et al., 2007; Pajares & Valiante, 1997; Perry et al., 2012; Yenilmez & Korkmaz, 2013). showed a variance between male and female students as well as some variance among different ethnicities (Jonson-Reid, Davis, Saunders, Williams, & Williams, 2005; Kennedy, 2009; Perry et al., 2012). The current study included research questions that were intended to determine if a variance existed between genders as well as among ethnicities, and to what extent. Included ethnicities in the research conducted for this current study were Whites, Blacks, and Hispanics. Further research questions were addressed to determine if there was any variance within the four sources from which self-efficacy is derived and the level of impact each had on reading achievement. The current

study included two measurement tools, one that was required by the researcher's district to measure reading achievement, and the other used to measure self-efficacy. NWEA MAP was used to measure reading achievement, and the RSPS was used to measure self-efficacy. Finally, the literature review showed a gap in the research related to the use of interventions. MobyMax®, an online curriculum with instructional tools that included tutorials, assessments, as well as an adaptive feature that focused students' assignments on individual learning levels and mastery, was used in this current study as an intervention. The intended outcome was to increase self-efficacy levels as well as reading achievement levels. Minimal independent research existed related to the effectiveness of MobyMax®, so this current study attempted to provide research to fill an existing gap. Additionally, the related correlations were compared across gender and ethnicity. Throughout the following literature review, each of the aforementioned foci will be delineated.

### Self-Efficacy and Achievement

Bandura's (1977) seminal study of self-efficacy produced a definition that has been used as well as reaffirmed by thousands of researchers (Alfassi, 2003; Arslan, 2012; Henk & Melnick, 1995; Phan, 2012a). Additional studies have been conducted affirming the importance of self-efficacy's correlation to academic achievement. The literature review performed as a part of this current study focused on self-efficacy and the four contributing factors to its development as well as the resulting level of self-efficacy and its impact on academic achievement. One study by Bandura, et al. (1996) indicated that the full set of socio-cognitive factors, including the perceived self-efficacy of participants, their perceived social self-efficacy, and their self-regulatory efficacy,

accounted for 58% of the variance in academic achievement. Bandura et al. also found a statistically significant contribution from the parents' socioeconomic status as it related to both parents' academic aspirations for their children as well as students' own academic aspirations and self-efficacy. Although self-efficacy as defined by Bandura has far-reaching implications beyond academics, the focus of this current research is on the impact of self-efficacy on academic achievement across gender and ethnicity in a fourth-grade classroom. The following studies are related to self-efficacy and its impact on achievement.

Fast et al. (2010) examined the correlation between math self-efficacy and achievement. After an analysis of the data, the researchers reported a statistically significant drop in math self-efficacy in female participants as well as a statistically significant lower achievement level among participants receiving subsidized lunches. Another important finding was that mastery orientation contributed to participants' year-end math achievement as measured by the California Standards Test. Mastery experience is one of the four sources of self-efficacy as defined by Bandura (1977) and was one of the variables used in the current study.

The relationship between self-efficacy and achievement has been researched, and the results showed a significant, positive correlation between increased self-efficacy and academic achievement (Bandura, 1977; Bassi, Steca, Fave, & Caprara, 2007; Fast et al., 2010; Kim, Bong, Cho, & Ahn, 2012; Lee & Jonson-Reid, 2016; Usher & Pajares, 2008; Zimmerman, Bandura, & Martinez-Pons, 1992). The current study focused on reading, but the literature also showed a positive correlation across academic domains in reading, math, science, and writing as well as some differences related to gender and ethnicity.

Lee and Jonson-Reid (2016) investigated the under-researched area of self-efficacy predicting academic success in younger, primary-age students in an urban setting. The study explored the connection between self-efficacy and reading achievement among primary grade children in an urban setting. In addition, Lee and Jonson-Reid investigated whether primary level students could differentiate between self-concept and self-efficacy as well as whether concept or efficacy had more predictive power in reading achievement; furthermore, the mediating power of motivation and classroom behavior between self-efficacy and reading achievement was explored. The authors discovered that not only could primary-age students differentiate between self-concept and self-efficacy but also that task-specific self-efficacy statistically significantly influenced reading achievement. Lee and Jonson-Reid provided credibility to the current study with urban elementary students and the connection between self-efficacy and reading achievement.

Among adolescent participants in a high school biology class, Linnenbrink-Garcia, Stewart, Koskey, and Pugh (2012) investigated the correlation between motivational beliefs and prior knowledge to levels of understanding natural selection. Linnenbrink-Garcia et al. established a hierarchy that consisted of “(a) low interest/efficacy, low knowledge; (b) moderate interest/efficacy, low knowledge; (c) moderate-low interest, moderate efficacy, high knowledge; and (d) high interest/efficacy, moderate knowledge” (p. 45). The researchers discovered that no statistically significant evidence supported that motivational beliefs, prior knowledge, and gender were predictors of long-term conceptual understanding; however, for girls, academic self-efficacy supported short-term conceptual understanding. Further hierarchical cluster

analysis of the four profiles of motivational beliefs and basic prior knowledge revealed that high interest and efficacy paired with moderate basic prior knowledge resulted in the greatest conceptual change for girls. In addition, the combination of moderate interest and efficacy with high knowledge or high interest and efficacy with moderate knowledge provided the most enduring conceptual change for boys (Linnenbrink-Garcia et al.).

Furthering the research insights into self-efficacy and motivation, Usher and Pajares (2008) conducted a quantitative study to test the construct validity of items intended to assess self-efficacy for self-regulated learning. Self-efficacy for self-regulated learning contributed in a statistically significant way to writing achievement, science, and general academics (Usher & Pajares). Another important discussion in Usher and Pajares's study was that students' level of self-efficacy for self-regulating behaviors provided important insights into their academic motivation; however, it is important for teachers to monitor this because low self-efficacy, especially when it is not a result of capability can lead to despair and lack of achievement. It is important for teachers to be intentional in building students' confidence (Usher & Pajares). Similarly, to the suggestions in Usher and Pajares, the researcher of this current study focused attention, in part, on ensuring that students had success in order to promote improved self-efficacy through mastery experience provided by the intervention of MobyMax®. Usher and Pajares also suggested that students with low self-efficacy would struggle with perseverance especially when faced with difficult tasks.

Providing additional evidence for the connections across self-concept, self-efficacy, and self-esteem, Kim et al. (2012) investigated these constructs correlated to academic achievement in math across age groups and domains, and reported results that

showed a statistically significant correlation among self-concept, self-efficacy and academic achievement. Although self-concept and self-efficacy are not the same, this research shows a connection between the two, and provides evidence of their importance to academic achievement. Previous research by Bassi et al. (2007) discovered participants with high self-efficacy devoted more time and attention to academic pursuits and aspired to higher education attainment, while participants with low self-efficacy tended to avoid the more difficult pursuits and spent more time relaxing and engaging in less challenging activities like watching television, eating, and grooming. Wilson and Trainin (2007) investigated self-efficacy and students' achievement as correlated to perceived confidence and found that a statistically significant correlation existed between literacy achievement and attributions. Additionally, students with high achievement reported internal attributions focused on efforts, while lower achieving students credited achievement to external factors.

Further research revealed the constructs of and connections between self-efficacy and self-concept (Ferla, Valcke, & Cai, 2009). Ferla et al. studied these constructs of academic self-efficacy and self-concept, and the nature of the relationship between the two. In addition, Ferla et al. investigated the mediating and predictive factors for variables such as gender and prior knowledge as well as outcome variables such as math performance, interest, and anxiety. Their results indicated a distinct variance between self-efficacy and self-concept even within the same domain, and academic self-concept had a strong impact on academic self-efficacy. Additionally, Ferla et al. purported that academic self-concept predicts and mediates affective-motivational variables, while academic self-efficacy was a superior predictor and mediator for academic attainment.

Similar to the work by Usher and Pajeras (2008), Liew, McTigue, Barrois, and Hughes (2008) conducted a three-year, longitudinal study of first through third grade students that found a correlation between academic self-efficacy beliefs and both math and reading achievement. Liew et al. explained the benefits of supporting and promoting skills that enhanced the child's self-regulatory abilities. Liew et al. also suggested that such an effort would heighten academic self-efficacy and achievement, especially in literacy. Additionally, Phan and Ngu (2014) investigated the relationship between self-esteem and academic achievement as well as the relationship between self-efficacy and academic achievement. The results revealed an indirect connection between self-efficacy and academic achievement that resulted from a direct influence of academic engagement. Self-esteem also influenced academic achievement through academic engagement. The findings demonstrated the importance of academic engagement to improved levels of self-efficacy and self-esteem that in turn influenced academic achievement (Phan & Ngu).

Enactive learning experiences such as mastery learning are encouraged by Phan and Ngu (2014) to enhance and build both self-esteem as well as self-efficacy that in turn leads to greater academic achievement. A heightened sense of global self-efficacy encourages students to engage more proactively in a learning context. "The triarchic associations between self-esteem, global self-efficacy, and engagement, in this sense, illuminate the importance of positive self-beliefs in academic learning" (Phan & Ngu, p. 117).

Continuing the discussion of increased academic achievement, Multon, Brown, and Lent (1991) conducted meta-analyses of the relationship of self-efficacy to academic



achievement and persistence that revealed a statistically significant positive correlation between self-efficacy and academic achievement. The authors investigated 36 studies with over 60%, more than 22 out of 36, of the studies focused on elementary age students as was the age level used in the current study. Multon et al. discovered that students' achievement levels were strongest among low-achieving students that suggested self-efficacy had a greater impact in facilitating the learning and academic success of lower-achieving students. The results of their study indicated the importance of providing lower-achieving students a greater opportunity for mastery experiences as well as other opportunities to build on success (Multon et al.). Thus, Multon et al. provided a foundation for using an intervention such as MobyMax® to promote self-efficacy, including mastery experience, and academic achievement in reading.

Establishing additional evidence for the global impact of self-efficacy and academic achievement, Carroll et al. (2009) conducted a study in Australia that investigated, in part, the relationship between self-efficacy and academic achievement in English. Self-efficacy contributed in a statistically significant way to increased academic achievement in English as well as a decrease in delinquency (Carroll et al.). Carroll et al.'s study provided support for the current study that measured reading achievement resulting from increased self-efficacy by way of the use of MobyMax® as the intervention. Per Linnenbrink and Pintrich (2003), self-efficacy was a critical component in student engagement in the classroom as well as to students' achievement. In addition, Linnenbrink and Pintrich also provided evidence and encouraged teachers to establish classroom practices that enhanced self-efficacy resulting in increased student engagement and achievement.

As reviewed in the preceding research, increased levels of self-efficacy and the four contributing sources of self-efficacy contributed to increased levels of academic achievement. Self-esteem, self-concept, and motivation are also components of academic achievement, but the research has shown a strong, positive correlation between self-efficacy and academic achievement across academic subjects with some variance between genders and within ethnicities.

### Impact of Self-Efficacy's Contributing Sources

Further studies explored the four underlying sources of self-efficacy, mastery experience, social persuasions, physiological state, and vicarious experience, and discovered that both combined as well as individual contributions among the four sources of self-efficacy. The following section focused on the studies that identified correlations across each of the four contributing sources of self-efficacy.

The current study investigated the extent that the four sources of self-efficacy, mastery experience, social persuasions, physiological state, and vicarious experience, played a mediating role in reading achievement (Pajares, et. al., 2007). Other studies have shown a strong, positive correlation between mastery experiences and academic achievement where mastery experience was a mediating factor (Archambault et al., 2010; Arslan, 2012; Bong, 2001; Joët, et al., 2011; Phan, 2012a, 2012b). Arslan revealed the extent that sources of self-efficacy beliefs predicted the level of self-efficacy beliefs toward learning and performance, determining the strongest correlation existed between participants' view of performance accomplishments and the participants' self-efficacy beliefs in learning and performance. Similarly, Bong investigated the between-domain relations of self-efficacy, task-value, and achievement goal. The findings revealed that

academic self-efficacy, task-value, and mastery goal perceptions were positively correlated across all subjects among both middle school and high school students (Bong). Bong also reported that students who feel more efficacious and perceive greater task-value put forth more effort to improve and to avoid appearing incompetent.

Providing a more holistic look across all four sources of self-efficacy, Joët et al. (2011) conducted a quantitative study that assessed the degree that sources of self-efficacy, mastery experience, social persuasions, physiological state, and vicarious experience, would influence the self-efficacy beliefs of third grade students in math and French. Furthermore, they investigated whether the level of influence was mediated by gender. Reported results indicated the most statistically significant correlation was between mastery experience and social feedback (Verbal persuasion) in both math as well as French for boys and girls (Joët et al.). Additional analysis found that girls reported lower self-efficacy in each of the four sources of self-efficacy despite achieving higher test scores in French than boys (Joët et al.). Joët et al. provided supportive evidence that each of the four sources of efficacy contributed significantly to students' feelings of academic self-efficacy.

Similarly, Phan (2012a) examined the development of the four sources of self-efficacy that consisted of performance, vicarious experiences, verbal persuasion, and emotional states in elementary students and their beliefs in English and math over time. The results indicated a statistically significant correlation between the participants' performance level and the increase in self-efficacy in both English and math (Phan). In addition, Phan reported a negative association between the participants' emotional states and the growth of change in mathematics self-efficacy. Both performance and verbal

persuasion were associated positively with initial levels of self-efficacy in English and math.

Following the previous findings, Phan (2012b) conducted an additional study that investigated the rate of change in self-efficacy and academic achievement goals as correlated to prior academic grades, self-efficacy, mastery and performance-approach goals, and academic achievement. Phan found a statistically significant correlation between mastery experience and increased self-efficacy, while the inverse applied where lack of mastery experience correlated to a statistically significant decrease in self-efficacy. Further analysis revealed a statistically significant correlation between both grades and increased self-efficacy as well as academic achievement and increased self-efficacy (Phan).

Twenty-one years before the Phan (2012a; 2012b) studies, Lent, Lopez, and Bieschke (1991) investigated the relationship between self-efficacy and the four sources of self-efficacy as they related to outcomes. Performance accomplishments, also known as mastery experience, contributed statistically significantly more than the other three sources of self-efficacy toward establishing increased self-efficacy (Lent et al.). Although performance accomplishment favored men in mathematics, Lent et al. posited it may be due to experience. When compared with men and women with similar experiences, the gender gap was no longer statistically significant. Lent et al. provided guidance and future direction in researching the differences in gender as well as the need to encourage the pursuit of mathematics across gender.

## Self-Efficacy and Achievement Variance Correlated to Gender

The current study investigated the extent of any mediating factors in increased self-efficacy or reading achievement that were attributed to gender. Other studies reviewed in chapter two assessed the role of gender in the development and impact of self-efficacy on achievement with mixed results (Louis & Mistele, 2012; Pajares, 2002; Pajares et al., 2007; Pajares & Valiante, 1997; Perry et al., 2012; Yenilmez & Korkmaz, 2013)

Pajares and Valiante (1997) investigated the relationships among self-efficacy and writing self-efficacy, writing performance, and writing apprehension as well as any variance present in gender. The results indicated that girls had increased self-efficacy, lower apprehension, and perceived writing as more important (Pajares & Valiante). Based on results of the data analysis, Pajares and Valiante concluded that self-efficacy had an independent and statistically significant positive correlation to writing performance as well as a mediating role in students' level of writing apprehension and students' perception of the usefulness of writing. Pajares et al. (2007) reported that the data revealed a statistically significant correlation among each of the four sources of self-efficacy and increased writing self-efficacy and achievement. Results indicated higher levels of writing self-efficacy accompanied with lower anxiety among elementary students, particularly girls (Pajares et al.).

Further research by Karaarslan and Sungur (2011) assessed the gender factor as related to age and self-efficacy and the impact on achievement. Karaarslan and Sungur examined the relationship between grade level and gender difference to science and technology self-efficacy. Also investigated was the relationship between self-efficacy and

socioeconomic status (Karaarslan & Sungur). The results showed a general decline in students' self-efficacy across grade levels; however, there were no statistically significant correlations related to gender or grade level, but the results indicated a statistically significant positive correlation between prior achievement and current level of self-efficacy. No statistically significant correlation was discovered between socioeconomic status and self-efficacy (Karaarslan & Sungur). Following the analysis and findings, Karaarslan and Sungur noted that an important implication of the study was that teachers should maximize students' opportunities that build on prior achievement that lead to increased levels of self-efficacy.

Yenilmez and Korkmaz (2013) investigated the relationship between the self-efficacy of elementary students in geometry and their levels of geometric thinking. Another component of the study was to identify any differences related to gender, grade level, math achievements, or pre-school education factors. Data was collected using the Van Hiele Geometry Test, Towards Geometry Self-Efficacy Scale and personal information forms. Yenilmez and Korkmaz's analysis found no statistically significant difference in self-efficacy as correlated to gender or pre-school education, but did find a statistically significant difference in knowledge application and the positive correlation to self-efficacy among the sixth-grade participants. Further analysis revealed a relationship between higher grades and higher levels of self-efficacy, leading to the recommendation that teachers establish practices that promote success (Yenilmez & Korkmaz). The recommendation of promoting success is related to the current study that promoted mastery experiences as part of increasing self-efficacy and achievement. Additional research conducted by Eccles, Wigfield, Harold, and Blumenfeld (1993) found gender

related differences in self-efficacy among elementary age students, with older students reporting more positive competence beliefs in sports, but the younger students reported higher self-efficacy beliefs and positive competence beliefs in the other areas of math, reading, and music. The boys reported higher competence beliefs in sports, and the younger boys reported higher self-efficacy in math as compared to their girl counterparts. Conversely, girls reported higher levels of self-efficacy in reading and music (Eccles et al.).

Louis and Mistele (2012) investigated the variance in self-efficacy and achievement among male and female students in math and science. The overall findings indicated males had a higher level of self-efficacy, with a statistically significant difference in math showing males with a higher level of self-efficacy, but no statistically significant variance in science self-efficacy (Louis & Mistele). Additionally, Louis and Mistele analyzed the variance in achievement levels for both math and science. Although a difference was discovered in math achievement scores, the variance was not statistically significant; whereas in science, males' achievement levels were higher by a statistically significant measure (Louis & Mistele). The variance in math self-efficacy and achievement levels were the most interesting, because males had higher levels of math self-efficacy with no statistically significant difference in achievement, while the opposite was true in science with no statistically significant difference in science self-efficacy, but males had higher achievement scores (Louis & Mistele). After additional analysis, Louis and Mistele revealed differences within the domains of each subject. The analysis revealed females achieved statistically significantly higher levels in algebra, with the overall math scores as well as those in the domains of Data, Number, and Geometry,

showing no statistically significant difference. In science, males scored statistically significantly higher in earth science, biology, and physics, with chemistry being the only domain with no statistically significant difference (Louis & Mistele).

Pajares (2002) uncovered a similar trend as mentioned in the previous study in that girls tend to report higher self-efficacy in English language arts including reading, while boys tend to report higher self-efficacy in math, science, and technology. Pajares discovered that the elementary age students did not report the same disparity, but as students progressed through school into middle school, the differences became more apparent. One important finding was that students who are explicitly taught and encouraged to take risks and to believe in themselves across the academic domains, increased their own personal academic self-efficacy (Pajares). Providing students with positive feedback on both their performance as well as their abilities led to increased levels of academic self-efficacy (Pajares). Having reviewed the literature related to self-efficacy and achievement as related to variance between male and female students, the next section will focus on the variance found across different ethnicities.

#### Self-Efficacy and Achievement Variance Correlated to Ethnicity

The current study investigated the extent of self-efficacy's contribution to achievement as well as the differences, if any, correlated to ethnicity. Other studies provided insights as well as foundational results related to variance across ethnicities (Jonson-Reid, et al., 2005; Kennedy, 2009; Perry et al., 2012). Jonson-Reid et al. (2005) investigated the relationship of the factors in establishing academic self-efficacy and the effect of academic performance on students of African American descent. Global self-esteem was found to contribute statistically significantly to academic self-efficacy



(Jonson-Reid et al.). The two variables that measured intrinsic and extrinsic motivation, along with the one variable that measured encouragement and role modeling contributed in a statistically significant way to enhanced academic self-efficacy. Finally, Jonson-Reid et al. suggested that although racial identity and self-esteem among African American youths are important, they are less critical than academic self-efficacy to academic functioning, and that enhancing students' belief in the importance of education is critical and may involve the school social worker.

In a similar study that looked specifically at the achievement gap, Kennedy (2009) investigated the effects of motivation, engagement, and self-efficacy on narrowing the achievement gap over a two-year period. The study was conducted in Dublin, Ireland in a high-poverty junior school and revealed many contributing factors to the gains made among the participants (Kennedy). Factors included the implementation of balanced literacy programs that facilitated engagement in a variety of reading and writing focused on self-guided choices students made based on their interests as well as the use of scaffolding toward the release of responsibility through collaborative groups in both reading and writing (Kennedy). The focus was on engaging students at deeper levels, while facilitating successful literacy activities over an extended time (Kennedy). Kennedy also found that the close partnering with parents and conveying a united importance and priority on literacy led to deeper levels of interest and engagement among the participants. The result was an increase in intrinsic values and attitudes towards literacy that led to higher levels of self-efficacy and achievement (Kennedy). Finally, Kennedy noted that the results were attained in part due to the professional development provided for teachers that improved their self-efficacy. The author posited that if higher

levels of achievement are a result of the collaborative efforts across stakeholders with student empowerment, then the higher levels of achievement are worth the additional effort required by districts to implement this type of collaborative professional development program that focuses on all stakeholders. This current study implemented MobyMax®, direct instruction at the students' individual levels, and focused on mastery. The intention was that the implementation of MobyMax® would increase students' self-efficacy and in turn, increase students' achievement in reading.

Adding depth to the research investigating the achievement gap in African American students, Shin (2011) researched the impact of Africentric values and neighborhood satisfaction on the academic self-efficacy of African American youth. Shin defined Africentric values as “work and responsibility, cooperative economics, purpose, creativity, and faith” (p. 220). The neighborhood satisfaction rating was primarily comprised of having positive academic self-efficacy beliefs that exist in neighborhoods where education is highly valued (Shin). The results indicated a statistically significant correlation between both Africentric values and neighborhood satisfaction and their contribution to increased levels of academic self-efficacy. The findings established a body of research that provided a look at some positive factors affecting the achievement gap. Shin argued that much of the research reviewed focused on negative indicators such as dropout rates and environmental circumstances such as poverty, and wanted to provide a view from a more positive perspective that could improve self-efficacy as well as achievement (Shin).

Providing additional insight into the impact of self-efficacy among minority participants, Perry et al., (2012) examined the interactions among gender, ethnicity, and

socioeconomic status (SES) in predicting academic aspirations, persistence, views of science, and academic self-efficacy. The results found that boys, both of African American as well as Latino descent, reported statistically significantly lower educational and science attitudes and aspirations than their White counterpart, while girls from African American and Latino descent reported equal or greater attitudes and aspirations than their White counterpart (Perry et al.). This author is investigating if an online instructional delivery program MobyMax® will statistically significantly influence increased levels of self-efficacy and reading achievement, and if reading achievement is mediated more by MobyMax® or the level of self-efficacy.

#### Self-Efficacy and Reading Achievement Measurement Tools

Bandura's (1977) research revealed and identified general self-efficacy and its four contributing sources as well as the correlation to task accomplishments. The focus of this present study was on reading self-efficacy and reading achievement. Although there were several published scales to measure self-efficacy, the two most applicable to the current research study were the Elementary Reading Attitude Survey (ERAS) (McKenna & Kear, 1990) and RSPS (Henk & Melnick, 1995). McKenna and Kear developed the ERAS as a tool for teachers to use to measure students' attitudes toward reading in both academic reading as well as recreational reading. McKenna and Kear reported statistically significant results that supported the survey's reliability and validity in assessing reading attitudes discretely on the two subscales of academic reading and recreational reading attitudes.

Kazelskis et al. (2005) and Kazelskis, Reeves, and Thames (2004) conducted validation studies of the ERAS that tested the reliability and stability across age

(Kazelskis et al., 2005), gender, and ethnicity (Kazelskis et al., 2004; Kazelskis et al., 2005). Although Kazelskis et al. (2005) reported the ERAS was statistically reliable, there was an instability within test, retest, and consistency, as compared to previous administrations, and it was recommended that the ERAS be administered multiple times at regular intervals to produce statistically reliable results (Kazelskis et al., 2005).

Kazelskis et al. (2004) found no variation across gender, but the results indicated a difference across racial groups as to the meaning of the ERAS. Although the implications were unclear, Kazelskis et al. (2004) suggested that future research conduct a replica study to provide more generalized results and to further understand the importance of the differences found across ethnicities. Despite the reliability and validity of the ERAS, it lacked the self-efficacy component desired for this current study.

This researcher decided to use the RSPS because of the relationship to Bandura's (1977) findings regarding self-efficacy, and although the RSPS does not use the term *self-efficacy*, the framework for the scale is based on and was tested on the four sources of self-efficacy: mastery experience, social persuasions, physiological state, and vicarious experience (Henk & Melnick, 1995). Henk, Marinak, and Melnick (2012) produced the RSPS2 that was specifically designed for seventh grade and above, and although the validating study contained the same subcategories for self-efficacy as the RSPS, it did not fit the demographic of the current study. The RSPS was tested for validity and reliability and showed, using factor analysis, a range of .81-.84, with each category contributing equally (Henk & Melnick). Further results found a consistent distribution of mean and standard deviation across grade levels, and the corresponding standard errors were low, resulting in a valid and reliable test (Henk & Melnick). The RSPS specifically targeted

upper-elementary students and provided the current study the desired tool for measuring students' self-efficacy and assessing the four supporting domains.

Reading achievement was measured using the NWEA MAP Adaptive Reading Assessment based on Common Core State Standards. According to Cordray, Pion, Brandt, and Molefe (2013), the MAP assessment is reliable and valid in assessing students' reading achievement. Cordray et al. also studied the training and instructional components of MAP, but this current study employed the MAP assessment solely as a pre- and posttest of participants' reading achievement levels. This current study used the reading data only to measure students' overall progress based on the data obtained from the August 2016 and December 2016 testing times. NWEA MAP is a nationally known assessment, approved by the school district used in this study to measure student growth based on national norms. More than 7,400 partners in U.S. schools, districts, education agencies, and international schools trust NWEA MAP to offer pre-kindergarten through grade 12 assessments that accurately measure student growth and learning needs (NWEA, n.d.).

### Interventions

Interventions have long played a role in teaching reading, but in recent years, there has been an increased focus on technological academic interventions. Mallette, Henk, and Melnick (2004) conducted a study that assessed a computer program called Accelerated Reader (AR) from Renaissance Place that claimed to promote improved attitudes towards reading. Mallette et al. reported mixed results with Accelerated Reader contributing in a statistically significant way to academic reading motivation, but not to recreational reading. In addition, Mallette et al. found that girls in the intervention group

who made use of Accelerated Reader exhibited higher self-perception than those in the control group who did not engage in Accelerated Reader.

Walters (2012) investigated the impact of using one-to-one mobile devices being implemented for English language learners' reading achievement and self-efficacy as well as to measure the students' perception of the benefits and limitations of having and using the device daily. Walters found a statistically significant positive correlation in the experimental group related to reading self-efficacy, but no statistically significant difference was found between the experimental and control group's achievement. Walters reported that the students who were in the experimental group described the use of the mobile devices as an enhancement to communication and learning.

Other non-technology related interventions have been investigated with mixed results (Forgrave, 2010; Hushman, & Marley, 2015; Meece & Miller, 1997). Meece and Miller measured the effects of classroom interventions on students' motivational goals, strategy use, and achievement effect. Meece and Miller found no statistically significant relation or variance in students' task orientation throughout the study, but the use of integrated curriculum, the intervention, demonstrated a positive effect on the students' motivation. Meece and Miller reported the lack of a control group was a limitation and recommended that data be collected from classes not implementing the intervention to afford more valid and reliable results. The present study implemented an intervention as well as a control group that added validity and reliability to the results and limited the number of external variables. Hushman and Marley investigated the impact of guided instruction on self-efficacy and achievement in science. Sixty fourth and fifth graders were randomly assigned to three conditions that included guided instruction, direct

instruction, and minimal instruction (Hushman & Marley). Students assigned to guided instruction (the intervention) demonstrated a statistically significant increase in science self-efficacy, while there was no statistically significant difference from the direct instruction group in the outcome measures of recall, application, and evaluation (Hushman & Marley). The participants assigned to the conditions of guided instruction and direct instruction performed statistically higher in the aforementioned outcome measures than the condition with minimal instruction (Hushman & Marley).

Another intervention used was the Rebecca Caudill Young Readers' Award Books implemented by Forgrave (2010). This study investigated the relationship between reading Rebecca Caudill Young Readers' Award Books and the students' reading motivation. As with the current study, gender was also considered, and per Forgrave gender alone was not a statistically significant factor in students' self-concept, but gender was a statistically significant factor in students' value of reading. Students' self-concept and motivation were improved with the results revealing a statistically significant increase because of reading the Rebecca Caudill Young Readers' Award Books. In addition, Forgrave found a statistically significant improvement in students' self-concept and motivation when their grades were higher, such as A's, and a decline in self-concept and motivation when grades were below A's. Although not the same, motivation, self-concept, and self-efficacy are related to each other as well as to the achievement levels attained by students. The current study focused on self-efficacy's impact on reading achievement as well as the impact of mastery experiences, which relates to the impact of higher grades (A's) in Forgrave's study.

Although there are many interventions available for teachers to implement, this author decided to employ MobyMax®, because of the limited outside research to address the claims of the producers of MobyMax®. MobyMax® is a curriculum for kindergarten through eighth grade and is based on the Common Core State Standards. The internal research (2X Learning, n.d.) reported on MobyMax®'s website indicates that MobyMax® includes direct instruction and mastery learning. Blohm and Associates (2016) reported increased academic growth in an Arkansas school of up to two years within the first half of the school year after implementing MobyMax®. Per Blohm and Associates, the Arkansas school implemented MobyMax® across their entire campus including both special education classes as well as the regular education classes. The results included a growth rate of up to two grade levels in the first half of the year. In addition, school representatives reported increased success in mainstreaming the special education students due to the implementation of MobyMax®. The report from school representatives cited the personalized structure of MobyMax® and the data reporting component provided the tools needed to fill in learning gaps as well as provided instant progress reports that guided instruction. With over 15 million students enrolled, MobyMax® continues to be a sought-after resource for educators to differentiate instruction for students (2X Learning; Blohm & Associates). When reviewing the research literature, MobyMax® appeared to have very limited independent research as to the program's impact on students and its effectiveness in promoting learning at the levels claimed by the producers of MobyMax®. The focal point of this current research study was to provide at least an opening to academic independent research into the claims regarding MobyMax®.



## Conclusion

Having conducted a thorough review of the literature, this researcher found common themes that are foundational to the current study. A key finding throughout the literature reviewed was that self-efficacy contributed in a statistically significant way to overall achievement (Bandura, 1977; Bassi, et al., 2007; Fast et al., 2010; Kim, et al., 2012; Usher & Pajares, 2008; Zimmerman, et al., 1992). Within the studies reviewed, there are variances across academic domains and gender (Pajares, 2002; Pajares et al., 2007; Pajares & Valiante, 1997; Perry et al. Yenilmez & Korkmaz, 2013). Findings revealed an overall advantage for boys in math and science, while girls had an overall advantage in English language arts and music. These studies produced inconsistent results across specific academic domains within each subject.

Differences across ethnicities were inconsistent when the research investigated the influence of self-efficacy on achievement (Jonson-Reid et al., 2005; Perry et al., 2012). One study (Shin, 2011) found that Africentric values and neighborhood pride contributed in a statistically significant way in the development of self-efficacy in African Americans; however, the level of self-efficacy contributed to achievement in a similar way across gender and ethnicity throughout the research reviewed. In Bandura's (1977) foundational study, the four sources (process accomplishments or mastery experiences, vicarious experience, verbal persuasion, and physiological states) of self-efficacy were revealed, and since Bandura's seminal research, much has been researched as to the contributions of each source to self-efficacy as well as to overall achievement. The findings revealed that mastery experiences contributed more to increased self-efficacy as well as achievement than the other three sources: Vicarious experience, verbal

persuasion, and physiological states (Archambault et al., 2010; Arslan, 2012; Bong, 2001; Joët, et al., 2011; Phan, 2012a, 2012b). This is not the case in every study, but it is the case in most the studies reviewed. There are studies that revealed the contributions of the other three sources (vicarious experience, verbal persuasion, and physiological states) were statistically significant, but mastery experiences were the most consistent across all the research reviewed (Archambault et al.; Arslan; Bong; Joët, et al.; Phan, 2012a).

Interventions were studied that related to self-efficacy, motivation, and reading achievement, both technology-based as well as more conventional approaches. The findings revealed an opportunity to use technology by way of an online instructional website entitled MobyMax®. Very little independent research has been done to validate the internal research and claims of MobyMax®. This researcher did not find any research studies that were peer-reviewed that had studied the impact, reliability, or validity of the claims made about MobyMax®.

The results of many studies have revealed the impact and development of self-efficacy as it related to academic achievement, but minimal research was found related to the use of MobyMax® as an intervention to increase reading self-efficacy or reading achievement. This researcher conducted this study to add to the research related to the impact of self-efficacy on achievement, to consider differences across gender and ethnicity, and to investigate the contributions of the four sources of self-efficacy to achievement. The gap in the research that constituted the focal point of this current research was the use of MobyMax® in a concentrated way to improve both the reading self-efficacy as well as reading achievement levels of fourth grade students in an urban elementary school in a Midwestern state.

## Summary

In summary, the research found statistically significant correlations between self-efficacy and achievement, and although some results were inconsistent, important findings were reported related to variances along gender and ethnic domains. In addition, supported Bandura's (1977) research findings related to the four contributing sources of self-efficacy with mastery experiences being the most statistically significant contributor to academic achievement. Based on research findings showing the value in implementing interventions, this researcher implemented a technological intervention in order to improve reading self-efficacy and achievement. The intervention used for this current study was MobyMax®. The following chapter will detail the methodology used to conduct the current study. The overarching intent of this current study is manifold: (a) to add to the expansive body of research related to self-efficacy's impact on achievement; (b) to add to the research related to the contributing effect of the four sources of self-efficacy on achievement, (c) to add and bring clarity to the variance within gender and ethnic domains, and (d) to provide an independent research study that investigated the effect of MobyMax® on both reading self-efficacy as well as reading achievement and the extent of variance between genders and across ethnicities.

## CHAPTER III

### METHODOLOGY

#### Introduction

Previously reviewed literature in Chapter II indicated a relationship between self-efficacy and achievement across a variety of academic subject areas. Beginning with the seminal work of Bandura (1977), research (Bassi, et al., 2007; Fast et al., 2010; Kim, et al., 2012; Lee & Jonson-Reid, 2016; Usher & Pajares, 2008; Zimmerman, et al., 1992) has repeatedly shown the importance of self-efficacy to academic achievement with the focus of this current study being the importance of self-efficacy to reading achievement. In addition, the current research investigated the impact of an online reading intervention for reading on participants' level of self-efficacy as well as the impact on their reading achievement.

Using a quantitative quasi-experimental design, this researcher investigated the relationships and interactions between self-efficacy and reading achievement over time both before as well as after the implementation of an online reading intervention. The RSPS (Henk & Melnick, 1995) was used to measure self-efficacy, and the NWEA MAP was used to measure reading achievement. Participants were given a pretest in August 2016 with both the RSPS as well as the NWEA MAP, and an identical posttest in December 2016. In addition, the means across gender and ethnicity were explored to identify any statistically significant differences in these realms on self-efficacy and reading achievement. Finally, the RSPS was further analyzed to

identify the contributions to reading achievement of each of the four subscales within self-efficacy: Progress, observational comparison, social feedback, and physiological states.

### Research Design

The following research questions guided the data collection and analysis of data for this current research study:

1. To what extent was the students' overall reading self-efficacy level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
2. To what extent was the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
3. To what extent did each subscale within the RSPS—progress, observational comparison, social feedback, and physiological states—contribute to students' overall reading achievement?
4. To what extent did self-efficacy and reading achievement vary between male and female students?
5. To what extent did self-efficacy and reading achievement vary by ethnicity (including White, Black, Hispanic, and other)?

A quantitative, quasi-experimental design was chosen for each of the five research questions. Using 3 fourth grade classrooms, one of which this researcher was the teacher, made random assignment impractical. According to Salkind (2012), the quasi-experimental design does not use random assignment as with a true experimental design.

This current study investigated comparisons across gender and ethnic domains as well as the impact of each of the four contributing sources of self-efficacy and their level of influence on reading achievement.

Three classes of fourth graders were split into two groups. According to Salkind, a convenience sample is a captive audience that makes sampling convenient. In this current research study, the sample was based on convenience sampling due to the impracticality of conducting this research outside the sphere of influence held by the researcher. The three classes were divided based on the researcher's class of 25 participants plus six participants from a second teacher as the intervention group  $n = 31$ , and the remaining students from the second teacher with the third teacher's entire class as the control group  $n = 47$ . The six students from the second teacher equaled the number of students the second teacher agreed to have in the control group for the duration of the intervention.

The intervention group experienced an hour each day using MobyMax® as the online academic reading intervention, while the control group did not use MobyMax® in the same focused way. A few ( $n$  was not calculated for this) of the students in the control group used MobyMax® occasionally, but not in the regimented or controlled way that would have mirrored the group who received the intervention.

For research questions one and two, the independent variables were the control group and the experimental or intervention group, and the dependent variables were the reading achievement and RSPS pretest and posttest outcomes. A mixed factorial Analysis of Variance (ANOVA) or the One-Between-One-Within Subjects ANOVA was used to analyze these two research questions (Yockey, 2011). For research question three, the

independent variables or predictors were the four contributing sources of self-efficacy and the dependent variable was reading achievement. Using multiple linear regression, this researcher analyzed the data to determine the individual contribution of the four predictors or independent variables to overall reading growth. The fourth research question focused on gender differences with male and female being the independent variables with reading achievement and RSPS outcomes as the dependent variables. An independent *t*-test was used to analyze the mean differences for reading achievement and self-efficacy between males and females. The independent variables or predictors for the fifth research question were the ethnic groups: White, Black, Hispanic, and other; whereas, the dependent variables or outcomes were the reading achievement and the RSPS results. Two separate, between-subjects, one-way ANOVAs were conducted. The first ANOVA predicted reading self-efficacy from ethnicity, and the second ANOVA predicted reading achievement from ethnicity.

### Participants

Participants were selected from an urban district population located in a Midwestern state. Student population in this district consisted of 6,751 students with 58 per 100 students representing minorities, which is higher than the 50 per 100 represented within the state; most minority students were Black (“Public School Review,” n.d.). The sample consisted of 78 fourth-grade students (42 males, 36 females) from three classrooms in an urban, magnet-elementary school in the Midwest. This magnet school population was drawn proportionately from each of the elementary schools across the district (“Public School Review”) and had a much lower mobility rate as compared to the district; only nine per 100 students move to another school as compared to 25 per 100 in

the entire district population. Forty-four minority students and 34 Caucasian students constituted the sample for this current study.

### Data Collection

The district superintendent granted permission for the study to be conducted followed by the three participating classroom teachers agreeing to partake in the study. The sample consisted of the students in all three classrooms, and each students' parents or guardians received informed consent letters. Informed consent forms were accepted throughout the project up until the end of the data collection. Because the intervention and pre- and posttests are normal classroom activities, permission was only necessary to share or publish the data, not to collect the data.

Each of the 3 fourth-grade classes participated in a pretest, administered in August 2016 as well as a posttest in December 2016. Both sessions consisted of the administration of the RSPS to measure reading self-efficacy, and demographic questions were added to identify gender and ethnicity. The NWEA MAP assessment was administered during the same timeframe. Due to security issues of the test, a copy of the actual test was not included in the appendices. The RSPS and demographic questions were administered using SurveyMonkey, an online survey tool, while the NWEA MAP assessment was administered using an online system designed by NWEA and adopted by the school district. To measure self-efficacy, participants completed RSPS created by Henk and Melnick (1995).

The RSPS contains 33 questions divided into five subscales assessing the following: (a) General perception with one question (e.g., I think I am a good reader.), (b) progress with nine questions (e.g., When I read, I don't have to try as hard as I used to.),



(c) observational comparison with six questions (e.g., I read faster than other kids.), (d) social feedback with nine questions (e.g., My teacher thinks that my reading is fine.), and (e) physiological states with eight questions (e.g., Reading makes me feel happy inside.) (Henk & Melnick). As mentioned previously, research has shown that mastery experiences (progress) predicted academic self-efficacy in both girls and boys (Usher & Pajares, 2006). Participants responded using a 5-point Likert-type scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Although the RSPS is available in the public domain, the authors declined publication in full in this current text.

Participants' reading achievement was measured using the NWEA MAP assessment. Used as a district level assessment, the NWEA MAP is administered to all elementary students across the district. Covering English language arts Common Core State Standards, the NWEA MAP assessment is adaptive containing 32-52 questions and was reported as an overall grade level equivalency score. The NWEA MAP test is a reliable and valid test approved and mandated by our district. MAP used a stable equal-interval vertical scale called the Rasch Unit (RIT) scale (NWEA, n.d.).

MobyMax®, an online learning system that provides and delivers curriculum based on national standards as well as on the Common Core Learning Standards, was the reading intervention used for this present study. MobyMax® was selected due to the alignment with Common Core State Standards, as well, the researcher secured a grant to purchase MobyMax® in its fullest form. In addition, MobyMax® met the criteria for the focus on differentiated instruction, while providing a focus on mastery (2X Learning, n.d.). The creators of MobyMax® employed the power of direct instruction by breaking down standards into clear learning objectives for students, providing instruction in the

form of teach-me lessons, and presenting students with multiple experiences to practice and develop a deep understanding of specific skills while providing high-quality feedback throughout the learning process (2X Learning).

In the intervening months, students in the intervention group participated in the MobyMax® intervention; whereas, the control group did not. Students in the intervention group were assigned equal time, 20 minutes per day each, to MobyMax®'s Reading Stories, Reading Literature Skills, and Reading Informational Skills modules at each of their individual reading levels. Beginning reading levels were determined using MobyMax®'s built-in assessment system. MobyMax®'s assessment system was only used for the reading placement levels of the intervention group, not to determine the final growth or reading achievement level used in the analysis. All participants were given the NWEA MAP assessment as a pretest as well as a posttest to determine growth and final reading achievement levels.

Of the 78 participants, two did not provide consent and were excluded from the data analysis and reporting, leaving 31 in the intervention group and 45 in the control group. One student from the intervention group did not take the NWEA MAP assessment, leaving 30 participants from the intervention group and 45 from the control group for the reading achievement data. In addition, for the RSPS data the parameters set for the Statistical Package for the Social Sciences (SPSS) allowed for organization of the data such that 58 participants for questions one and five, 67 participants for question three, and 64 (posttest) and 68 (pretest) participants for question four were included for analysis.

## Analytical Methods

All research questions were organized for analysis using SPSS Version 24.

Descriptive statistics were included for demographic information as well as the mean, median, mode, and standard deviation for each of the inferential statistics calculated. Research question one contained the relevant variables of the students' reading self-efficacy and the intervention condition to which they were assigned (reading intervention present vs. absent). According to Yockey (2012), the one-between-one within subjects ANOVA was used when one of the independent variables contained two or more levels present for both the intervention group as well as the control group. This is referred to as the within-subjects variable, and another independent variable contained two or more levels in which only one group of participants received the treatment or intervention, denoted as the between-subjects variable. The pretest and posttest (time) comprised the within-subjects independent variable, and the intervention versus control group assignments comprised the between-subjects independent variable consisting of two levels. The reading self-efficacy scores comprised the dependent variable.

Data were analyzed using a mixed factorial ANOVA, also referred to as one-between, one-within subjects ANOVA, predicting reading self-efficacy from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition. The mean and standard deviations were also calculated.

Relevant variables for question two consisted of the students' reading achievement scores and the intervention condition to which they were assigned (reading intervention present vs. absent). The MAP pretest and posttest represented the within-subjects independent variable, and the intervention and control groups were the between-

subjects independent variable consisting of two levels. The levels included the intervention group and the non-intervention group, and the pretest and posttest. The presence of a pretest and posttest as well as intervention and control groups with the absence of random assignment made this question a quasi-experimental design (Salkind, 2012). Analysis was conducted using a mixed factorial ANOVA, also referred to as one-between, one-within subjects ANOVA, predicting Reading Achievement from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition. The mean and standard deviations were also calculated.

For question three, a series of predictors were measured. Each predictor was calculated from the four subscales from the RSPS scale (progress, observational comparison, social feedback, and physiological states). Individual reading achievement scores constituted the outcome. This researcher ran a single multiple regression with each subscale score from the pretest as a predictor and a reading difference score calculated by subtracting the pretest scores from the posttest scores as the outcome. The mean and standard deviations were also calculated.

Measured variables for question four included students' self-efficacy, reading achievement, and gender. Self-efficacy and reading achievement were the dependent variables, and gender was the independent variable. Gender was measured using a single demographic question at the end of the RSPS. Two independent sample *t*-tests were conducted with one comparing males to females on reading self-efficacy and the second comparing males to females on reading achievement. The mean and standard deviations were also calculated.

Measured variables for question five included students' self-efficacy, reading achievement, and ethnicity: White, Black, Hispanic, and other. Self-efficacy and reading achievement were the dependent variables and ethnicity was the independent variable. Two separate, between-subjects, one-way ANOVAs were conducted. The first ANOVA predicted reading self-efficacy, the dependent variable from ethnicity, the independent variable, and the second ANOVA predicted reading achievement from ethnicity. The mean and standard deviations were also calculated.

### Limitations

Participation levels for the RSPS presented a limitation. This researcher used the recovery method of calculating the mean of all responses for participants who failed to answer one question on the RSPS resulting in an additional seven participants for the intervention group and eight participants for the control group for a total recovery of 15 participants bringing the total to 58. Without having recovered the 15, the final participants analyzed for the self-efficacy data would have been 43. Those who missed two or more questions were removed from the statistical tests calculating self-efficacy. The use of a convenience sample was a limitation in that it restricted the number of participants as well as the ability to generalize across the population (Salkind, 2012). Assignment to the control versus experimental group was pre-determined by convenience as well and was not random. The current study did not control for pre-existing differences, and an ideal version of this study would have involved random assignment to conditions.

Additional limitations included the sample size and restricted access due to the researcher's position as a classroom teacher. Access for the experimental group was

restricted because the number of students was limited to the researcher's own class and the number permitted from the partner teacher. Six students from the other class was allowed rather than the ten initially requested. Having three fourth grade classrooms from which to draw participants provided a sample size of 78 students.

Other limitations included the lack of consistency in the participants' attention and focus within the intervention group and assigned hour per day throughout the intervention period that was from August 2016 through December 2016. Although participants had the same time available and were assigned reading selections based on their individual levels, the care with which they read and reread the selections and answered the questions varied.

### Summary

Self-efficacy and achievement have an established relationship in which the contributing sources of self-efficacy also play a role in the development of self-efficacy as well as the extent of impact self-efficacy has on achievement (Bassi, et al., 2007; Fast et al., 2010; Kim, et al., 2012; Lee & Jonson-Reid, 2016; Usher & Pajares, 2008; Zimmerman, et al., 1992). The current research study introduced a reading intervention, MobyMax®, an online reading program in order to identify the intervention's impact on improving self-efficacy or reading achievement. A mixed ANOVA was conducted for the first two research questions that included an intervention and control group as the between-subjects independent variables and a within subjects pre- and posttest for self-efficacy and reading achievement with the outcomes of each as the dependent variable. Independent samples *t*-tests were used to identify differences between male and female participants in reading achievement as well as self-efficacy. Two, between-subjects, One-

way ANOVAs were used to analyze variance between and within ethnic groups with each group as the independent variables (four levels) and the results of the pre- and posttests for self-efficacy and reading achievement as the dependent variables. Finally, a multiple regression was used to identify differences found in the level to which the four sources of self-efficacy: Progress, observational comparison, social feedback, and physiological states, contributed to the outcome of self-efficacy and reading achievement. Although there were limitations present throughout the current study, the results were calculated and will be discussed and presented in detail in Chapter IV.

In addition, Chapter IV, discusses recommendations for conducting similar studies and the ways in which to minimize the limitations found in the current study. Chapter IV provides recommendations for future studies related to the development of self-efficacy and achievement in general as well as ideas for further investigations into the variance found across gender and ethnicities.

## CHAPTER IV

### FINDINGS AND CONCLUSIONS

#### Introduction

Self-efficacy, as defined by Bandura (1977) and studied by others (Bandura; Bassi, et. al., 2007; Fast et al., 2010; Kim, et. al., 2012; Lee & Jonson-Reid, 2016; Usher & Pajares, 2008; Zimmerman, et. al., 1992) and the relationship between self-efficacy and achievement provided the foundation for this current study. Gender (Louis & Mistele, 2012; Pajares, 2002; Pajares et al., 2007; Pajares & Valiante, 1997; Perry et al Yenilmez & Korkmaz, 2013) and ethnicity (Jonson-Reid, et. al., 2005; Kennedy, 2009; Perry et al., 2012) were also examined based on previous research that produced mixed and foundational results as delineated in Chapter II. The aforementioned research consistently demonstrated the importance of self-efficacy across academic domains, while mixed results were found for the mean differences across gender and ethnicity.

Additionally, self-efficacy was determined to be comprised of four contributing sources, performance accomplishments or mastery experiences (progress), vicarious experiences, verbal persuasion, and physiological states (Bandura, 1977). Using an online intervention to improve students' self-efficacy and reading achievement, this current study examined the impact of online instruction on self-efficacy and reading achievement across gender and ethnicity.



The following questions guided this author's research into self-efficacy and the level of impact of its contributing sources, performance accomplishments or mastery experiences, vicarious experiences, verbal persuasion, and physiological states, on reading achievement, as well as the impact of MobyMax® on improving self-efficacy and reading achievement across gender and ethnicity,

1. To what extent is the students' overall reading self-efficacy level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
2. To what extent is the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group?
3. To what extent did each subscale within the RSPS—progress, observational comparison, social feedback, and physiological states—contribute to students' overall reading achievement?
4. To what extent does reading self-efficacy and reading achievement vary between male and female students?
5. To what extent does reading self-efficacy and reading achievement vary by ethnicity (including White, Black, Hispanic, and other)?

### Findings

Four out of the five questions researched in this study used the RSPS to collect data. The RSPS was found to be reliable both in its initial stage with a range of .81-.84, with each category contributing equally (Henk & Melnick, 1995) as well as in this

current study. The results of the Cronbach's Alpha reliability tests for this current study are included in Table 1.

Table 1

*Reliability Results for Scale and Subscale Scores*

Survey	<i>N</i>	<i>Cronbach's Alpha</i>
RSPS Pretest	33	.89
RSPS Posttest	33	.94
Progress Pretest Subscale	9	.82
Progress Post Subscale	9	.87
Observational Comparison Pretest Subscale	6	.81
Observational Comparison Post Subscale	6	.84
Social Feedback Pretest Subscale	9	.77
Social Feedback Post Subscale	9	.86
Physiological States Pretest Subscale	8	.68
Physiological States Post Subscale	8	.90

Research Question One

Research question one focused on the extent that the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group. The relevant variables were the students' reading self-efficacy scores as reported on the RSPS and the intervention condition to which they were assigned (reading intervention present vs. absent). Self-efficacy scores were the dependent variable, time (pretest/posttest) was the within-subjects independent variable, and the intervention was the between-subjects

independent variable consisting of two levels. The levels consisted of inclusion in the intervention and exclusion from the intervention. The presence of a pre-survey and post survey as well as intervention and control groups with the absence of random assignment made this methodology a quasi-experimental design. Reading self-efficacy was measured both in August 2016 as a pretest and in December 2016 as a posttest using the RSPS. Online delivery of instruction through MobyMax® constituted the intervention.

Analysis was conducted using a mixed factorial Analysis of Variance (ANOVA) (one-between-one-within ANOVA) predicting self-efficacy from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition (Yockey, 2011). Descriptive statistics from SPSS revealed 58 participants completed the RSPS in its entirety for both the pretest as well as the posttest. Out of the sample size of 78, only 58 participants completed the survey satisfactorily. Two students did not return the consent form, and 18 students missed two or more questions on one or both pretest and posttest. Participant numbers were lower for the RSPS due to students missing two or more questions on the survey. The mean and standard deviations of each condition group are reported in Table 2.

Table 2

*Descriptive Statistics for Self-Efficacy Survey in Each Condition*

Time	Intervention			Non-intervention (Control Group)		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Pre-test	26	132.76	11.45	32	130.38	15.25
Posttest	26	131.18	20.34	32	134.68	22.13

A 2 X 2 one-between-one-within ANOVA on reading self-efficacy was conducted with an online reading intervention as the condition (intervention ( $N = 26$ ), non-intervention (control) ( $N = 32$ )) as the between subjects factor and time (pretest and posttest) as the within subjects factor. There was no statistically significant interaction between time and condition,  $F(1, 56) = 1.76, p = .19$ , partial  $\eta^2 = .03$ . Additionally, the results indicated no statistically significant main effect for condition,  $F(1, 56) = .02, p = .89$ , partial  $\eta^2 = .00$ , as well as no statistically significant main effect for time,  $F(1, 56) = .38, p = .54$ , partial  $\eta^2 = .01$ . Yockey (2011) provided the guidance for the format of the stated results from the 2 X 2 one-between-one-within ANOVA.

#### Research Question Two

Research question two examined the extent that the students' overall reading achievement level increased by the implementation of an online reading instruction delivery intervention as compared to the non-intervention group. The relevant variables were the students' reading achievement scores and the intervention condition to which they were assigned (reading intervention present vs. absent). Reading achievement was the dependent variable, time was the within-subjects (pretest/posttest) independent variable, and the intervention was the between-subjects independent variable consisting of two levels. The levels were with the intervention and without the intervention. The presence of a pretest and posttest as well as intervention and control groups with the absence of random assignment made this question a quasi-experimental design. Reading Achievement was measured both in August 2016 as a pretest and in December 2016 as a posttest using the NWEA MAP assessment Online delivery of instruction through MobyMax® constituted the intervention.

The analysis was conducted using a mixed factorial ANOVA (one-between-one-within ANOVA) predicting reading achievement from time (pretest vs. posttest) and condition (intervention vs. control) as well as the interaction between time and condition (Yockey, 2011). Descriptive statistics from SPSS revealed 75 participants completed the NWEA MAP in its entirety including both the pretest and posttest. The number of students who were assigned the NWEA MAP for both the pretest and posttest was 78; however, one student did not complete the posttest, and was excluded from the data analysis and two students did not return the consent form, leaving a total of 75 participants who completed both the pretest and the posttest. The NWEA MAP was selected because it is a district mandate for assessing student growth and is administered three times per year.

A 2 X 2 one-between-one-within ANOVA on reading achievement was conducted with an online reading intervention as the condition (intervention ( $N = 30$ ), non-intervention (control) ( $N = 45$ )) as the between subjects factor and time (pretest and posttest) as the within subjects factor. Time represented the pretest and posttest growth over time without calculating the effect of the intervention. There was no statistically significant interaction between time and condition,  $F(1, 73) = 2.37, p = .13$ , partial  $\eta^2 = .03$ . Additional results showed no statistically significant main effect for condition,  $F(1, 73) = 1.66, p = .20$ , partial  $\eta^2 = .02$ , but there was a statistically significant main effect for time,  $F(1, 73) = 23.87, p = .00$ , partial  $\eta^2 = .25$ . The scores on the pretest ( $M = 191.48$ ,  $SD = 16.43$ ) were statistically significantly lower than scores on the posttest ( $M = 197.01$ ,  $SD = 16.13$ ). Yockey (2011) provided the guidance for the format of the stated results

from the 2 X 2 one-between-one-within ANOVA. The mean and standard deviations of each condition group are reported in Table 3.

Table 3

*Descriptive Statistics for Reading Achievement in Each Condition*

Time	Intervention			Non-intervention (Control Group)		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Pre-test	30	189.63	16.29	45	192.71	16.58
Posttest	30	193.20	16.81	45	199.56	15.32

Research Question Three

Question three focused on the extent that each subscale within the RSPS—progress, observational comparison, social feedback, and physiological states—contributed to students’ overall reading achievement. The relevant variables included each subscale score from time one or the pretest, measured using the RSPS, as predictors or independent variables, and overall reading achievement growth, measured by the NWEA MAP administered at time two or the posttest, as the dependent variable. This question is correlational, because the regression is looked for a correlation

This researcher ran a single multiple regression with each subscale calculated from time one (pre-test) as indicated by the RSPS as predictors and reading achievement growth (posttest minus pretest score) as the outcome. Reading achievement was calculated by taking the posttest results and subtracting the pretest results creating a difference or growth score. Overall, the regression was not statistically significant,  $F(4, 62) = .99, p = .42, R^2 = .06$ . Based on the overall regression, only six percent of the variance in the reading achievement scores are attributed to the self-efficacy subscales.

Each of the predictors were statistically insignificant as well. Progress was  $\beta = -.29$ ,  $t(62) = -1.87$ ,  $p = .07$ , observational comparison was  $\beta = .11$ ,  $t(62) = .77$ ,  $p = .44$ , social feedback was  $\beta = .10$ ,  $t(62) = .66$ ,  $p = .51$ , and physiological states was  $\beta = .11$ ,  $t(62) = .77$ ,  $p = .44$ . Descriptive statistics from SPSS revealed that out of the sample size of 78, 67 participants completed the subscales satisfactorily. Two students did not return the consent form, and 9 students did not complete the RSPS's subscales satisfactorily. Participant numbers were lower for the RSPS subscales due to students missing two or more questions on the survey. Descriptive statistics are portrayed in Table 4.

Table 4

*Descriptive Statistics for Self-Efficacy's Subscale Prediction of Reading Growth*

	<i>N</i>	<i>M</i>	<i>SD</i>
Reading Growth	67	5.28	9.15
Progress	67	38.13	4.95
Observational Comparison	67	20.45	4.46
Social Feedback	67	34.21	4.71
Physiological States	67	33.45	4.24

Research Question Four

Research question four examined the extent that reading self-efficacy and reading achievement varied between male and female students. The relevant variables included gender as the independent variable at two levels, male and female, and the dependent variables or outcomes were self-efficacy and reading achievement.

Two separate independent *t*-tests were conducted to compare the means of male and female scores on both self-efficacy as well as reading achievement. The results of the

independent samples  $t$ -test for self-efficacy showed the pretest mean comparisons as not statistically significant  $t(66) = 1.03, p = .31, d = .18$ . In addition, the posttest results were also not statistically significant,  $t(62) = 1.67, p = .10, d = .30$ . There seemed to be no meaningful differences between males and females on pretest or posttest self-efficacy scores, and both had small effect sizes (Yockey, 2011). Descriptive statistics from SPSS revealed 68 participants completed the pretest and 64 completed the posttest. Participant numbers were lower for the RSPS due to students missing two or more questions on the survey. The mean and standard deviations for both the pretest and posttest for self-efficacy are in Table 5.

Table 5

*Descriptive Statistics for Self-Efficacy Across Gender*

Gender	<i>N</i>	<i>M</i>	<i>SD</i>
Pretest results for Female	30	132.43	13.61
Posttest results for Female	29	138.47	13.88
Pretest results for Male	38	128.91	14.41
Posttest results for Male	35	129.97	24.32

For the second independent samples  $t$ -test, Levene's test had a  $p$ -value that was  $p < .05$  for both the pretest as well as the posttest so equality of variance was not assumed. The independent samples  $t$ -test indicated that the pretest mean difference between males and females in reading were statistically significant,  $t(66.23) = 3.07, p < .01, d = .53$ .

The posttest results were also statistically significant,  $t(68.92) = 2.57, p < .02, d = .44$ . The posttest had a small effect size of  $d = .44$ ; although  $d = .44$  is small,  $d = .5$  is considered a medium effect size (Yockey, 2011). Descriptive statistics, including the



mean and standard deviations for both the pretest and posttest for reading achievement are in Table 6.

Table 6

*Descriptive Statistics for Reading Achievement Across Gender*

Gender	<i>N</i>	<i>M</i>	<i>SD</i>
Pretest results for female	35	197.23	11.48
Posttest results for female	35	201.83	12.21
Pretest results for male	40	186.45	18.48
Posttest results for male	40	192.80	18.01

Research Question Five

Research question five examined the extent that reading self-efficacy and reading achievement varied by ethnicity (including White, Black, Hispanic, and other). The variables that were examined included a four-level independent variable, White, Black, Hispanic, and other, and the outcome or dependent variable was the reading self-efficacy and reading achievement results.

A one-way ANOVA was run that compared ethnic groups on reading self-efficacy scores, and another compared ethnic groups on reading achievement scores. Average self-efficacy levels did not differ across ethnicities at a statistically significant level.  $F(3, 54) = 1.94, p = .13, \eta^2 = .10$ . The effect size was medium (Yockey, 2011), yet the differences among the four groups was not statistically significant. Because of the medium effect size, it is likely that sample size contributed to the absence of statistical significance rather than it being due to a lack of meaningful difference. Descriptive statistics from SPSS revealed 58 participants completed the RSPS in its entirety for both the pretest as well as the posttest. Out of the sample size of 78, 58 participants completed

the survey satisfactorily. Two students did not return the consent form, and 18 students missed two or more questions on one or both pretest and posttest. Participant numbers were lower for the RSPS due to students missing two or more questions on the survey. Self-efficacy descriptive statistics included means and standard deviations and are displayed in Table 7.

Table 7

*Descriptive Statistics for Reading Self-Efficacy Across Ethnicities*

Ethnicity	<i>N</i>	<i>M</i>	<i>SD</i>
Black	17	-3.82	20.72
White	23	7.15	12.24
Hispanic	9	4.04	13.04
Other	9	-4.36	19.85

The number of students calculated in the analysis was 75 due to two students not returning the consent form, and one student did not take the posttest. Reading achievement's mean difference across ethnicities was not statistically significant  $F(3, 71) = .99, p = .40, \eta^2 = .04$ . The effect size was small and the differences were not statistically significant. Reading achievement descriptive statistics included means and standard deviations and are displayed in Table 8.

Table 8

*Descriptive Statistics for Reading Achievement Across Ethnicities*

Ethnicity	<i>N</i>	<i>M</i>	<i>SD</i>
Black	20	3.05	9.99
White	34	5.56	9.66
Hispanic	11	7.18	7.81
Other	10	8.60	6.02

## Conclusions

Previous research (Bandura, 1977; Bassi, et. al, 2007; Fast et al., 2010; Kim, et. al., 2012; Lee & Jonson-Reid, 2016; Usher & Pajares, 2008; Zimmerman, et. al., 1992) has shown a statistically significant positive correlation between increased self-efficacy and academic achievement. Questions one and two in this current research examined the impact of an online intervention (MobyMax®) on both reading self-efficacy and reading achievement using a quantitative, quasi-experimental approach. An intervention was introduced for the experimental group and implemented between the pretest and posttest. The results were not statistically significant leading to the conclusion that neither reading self-efficacy nor reading achievement was impacted by the intervention. Neither time (pretest/posttest) nor the intervention contributed to improved self-efficacy. Time did contribute to reading achievement in a statistically significant way. Both groups did have growth; however, the interaction between time (pretest/posttest) and condition (intervention/control groups) was not statistically significant in reading self-efficacy or reading achievement.

Question three investigated the relationship and contribution of the four underlying sources of self-efficacy, mastery experience, social persuasions, physiological state, and Vicarious experience, and found no statistically significant contribution of one greater than another contributing to reading achievement. Other studies have shown a strong, positive correlation between mastery experiences and academic achievement where mastery experience was a mediating factor (Archambault et al., 2010; Arslan, 2012; Bong, 2001; Joët, et al., 2011; Phan, 2012a, 2012b). This current study was not able to duplicate the same findings for mastery experience or any other statistically significant contribution from a single source. Reading growth from pretest to posttest was statistically significant, but no finding was established to indicate a significant influence from self-efficacy, nor any of self-efficacy's four contributing sources.

Question four looked at differences across gender in self-efficacy and reading achievement. This question did not consider the intervention, but rather looked at the overall difference between genders. Other studies reviewed in chapter two assessed the role of gender in the development and impact of self-efficacy on achievement with mixed results (Louis & Mistele, 2012; Pajares, 2002; Pajares et al., 2007; Pajares & Valiante, 1997; Perry et al., 2012; Yenilmez & Korkmaz, 2013). A study by Joët et al. (2011) revealed that girls reported lower self-efficacy in each of the four sources of self-efficacy despite achieving higher test scores in French than boys. In the current study, the mean differences for reading achievement were statistically significantly different between males and females. The results in reading self-efficacy did not indicate a statistically significant mean difference.

Research conducted by Pajares (2002) uncovered that girls tend to report higher self-efficacy in English language arts including reading, while boys tend to report higher self-efficacy in math, science, and technology. Pajares discovered that the elementary age students did not report the same disparity, but as students progressed through school into middle school, the differences became more apparent. In contrast to Pajares, this current study was conducted with fourth grade participants and showed no statistically significant disparity in self-efficacy.

Question five examined the difference across the mean scores in reading self-efficacy and reading achievement across White, Black, and Hispanic students as well as those who self-identified as other. Other studies provided insights as well as foundational results related to differences across ethnicities (Jonson-Reid, et. al, 2005; Kennedy, 2009; Perry et al., 2012). Jonson-Reid et al. investigated the relationship of the factors in establishing academic self-efficacy and the effect on African Americans' school performance. Jonson-Reid et al. suggested that although racial identity and self-esteem among African American youths are important, they are less critical than academic self-efficacy to academic functioning, and that enhancing students' belief in the importance of education is critical.

This current study implemented MobyMax® that provided direct instruction at the students' individual instructional levels and focused on mastery. The intention was that the implementation of MobyMax® would increase students' self-efficacy and in turn students' achievement in reading. The results of the current study showed no statistically significant differences across ethnicities in reading self-efficacy or reading achievement. The conclusion was that the intervention did not play a statistically significant role in

increased levels of reading self-efficacy or reading achievement; however, there was not a decrease either, leaving room for additional research and providing a basis on which to continue the use of MobyMax®.

### Implications and Recommendations

Based on the findings and conclusions for questions one and two, there was not a statistically significant finding for MobyMax®'s impact on reading self-efficacy or reading achievement. There was neither a negative effect nor a positive effect that led to the implication that the online intervention may be a viable option for delivering instruction. Overall reading growth over time was statistically significant; however, there was not a statistically significant interaction between time, pretest/posttest and the condition, with or without MobyMax®. In addition, this current study was unable to replicate the findings of previously mentioned research that showed self-efficacy correlated to reading achievement, implying a possible disconnect between the intervention and the outcomes of reading self-efficacy and reading achievement.

Research has shown a strong correlation between self-efficacy and academic achievement, and although this study did not produce findings to support this, it remains an important focus of instruction and future research. Although this current study did not find a statistically significant relationship between the sources of self-efficacy and reading achievement, the impact of the sources of self-efficacy remain an area of importance for future studies. Educators should continue to ensure students have opportunities to receive positive feedback in the areas of mastery experiences or progress, vicarious experiences, verbal persuasion, and physiological states. It is also

recommended that further research be conducted at the elementary level to identify viable methods of improving self-efficacy.

The next implication found in question four's findings is that males and females varied in their levels of reading growth. Further analysis could be conducted to look at the differences found in the presence of an intervention. The intervention in this current study was MobyMax®, an online instruction delivery system that targets students at their individual levels across subjects, and although overall reading growth was statistically significant, there was no statistical evidence to claim MobyMax® was a viable option for instruction. More research should be directed to targeting MobyMax® as an intervention for students. Archambault, et al. (2010) recommended future studies to explore interventions early, especially for boys.

A final implication from this current study is that while no statistically significant variance was found across White, Black, or Hispanic students, there remains an achievement gap that needs to be researched. More experiments need to be conducted that look for causes of the achievement gap and to search for viable interventions. In this current study, MobyMax® had no statistically significant impact on reading self-efficacy or reading achievement, but more research needs to be conducted to assess its impact on a variety of targeted student groups who have a variety of learning styles and levels of academic achievement. An additional area for further research would be to conduct a longitudinal study starting earlier, possibly kindergarten, and follow a cohort of students through elementary school. In this current study, the students had limited exposure to MobyMax®, and given more time to adjust to its features, the results may have indicated a more significant impact from using MobyMax®.

It is recommended that future studies that employ Survey Monkey, ensure that the questions are setup in such a way that participants are unable to continue if questions are left unanswered. This researcher did not catch this issue in time to correct it, and this simple aspect of the survey could have made a critical difference in the number of participants able to be analyzed. One final recommendation for future studies into self-efficacy and achievement using MobyMax® is to use a mixed method approach with a diverse selection of students composing a qualitative component to ascertain more of the participants' feelings and thoughts on the pros and cons of using MobyMax®.

Beginning with Bandura's (1977) seminal work on self-efficacy and self-efficacy's relationship to achievement, this study used MobyMax® as an intervention to measure its impact on improving reading self-efficacy and reading achievement. The current study investigated reading self-efficacy and reading achievement with and without the intervention and across gender and three ethnicities. There were no statistically significant differences discovered resulting from the intervention, but reading growth in both groups was statistically significant. More research needs to be conducted in order to find effective ways to improve self-efficacy and achievement levels at the elementary level and beyond.



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## Appendix A

### Permission to Modify Reader Self-Perception Scale

## Re: Doctoral Research Project for Dissertation

Henk, Bill <william.henk@marquette.edu>

Fri 1/1/2016 3:51 PM

To: Chad Wickard <cewickard@olivet.edu>;

Cc: Steven Melnick <sam7@psu.edu>;

Chad--

Dr. Melnick and I have communicated and if the only modification to the instrument you plan to make is to rekey it into an electronic format, then we have no issue with you doing so and using it that way.

We asked, however, that you do not reproduce the instrument in its entirety either in the body of a paper or in your appendices. You can list sample items but please don't go any further than that.

Best of luck with your dissertation.

BH

Sent from Bill Henk's iPhone

> On Dec 31, 2015, at 12:04 PM, Henk, Bill <william.henk@marquette.edu> wrote:

>

> Chad--

>

> Because it is a public domain instrument, you can use the RSPS in its present entirety without our permission as long as your purposes are not commercial.

>

> If you want us to approve a request to modify or adapt in anyway, we will need to know more about your study and specifically how you intend to change the instrument.

>

> There are also conditions we would insist upon as far as how it is represented in your dissertation itself --in the text, as a figure, or in the appendices.

>

> BH

>

> Sent from Bill Henk's iPhone

>

>> On Dec 29, 2015, at 10:33 PM, Chad Wickard <cewickard@olivet.edu> wrote:

>>

>> Dr. Henk,

>>

>> I have attached a request for permission to use or modify The Reader Self-Perception Scale for my dissertation. Please review and sign if you agree to grant permission for me to use the scale. Please feel free to contact me with any questions. Thank you.

>>

>> Chad E. Wickard

>> 4th Grade Teacher

>> RICMS

>> Rock Island, IL

>>

>> <Survey Permission Form 2015.doc>

## Appendix B

Permission to Conduct the Study Provided by the School District

Thursday, June 16, 2016 at 7:10:04 AM Central Daylight Time

**Subject:** RE: IRB Approval Granted

**Date:** Thursday, June 16, 2016 at 6:55:38 AM Central Daylight Time

**From:** [REDACTED]

**To:** Chad Wickard

Chad,

I apologize for the tardiness in my reply. After conferring with Dr. Ruggenberg, you have permission to conduct the study as presented and approved by the IRB.

Good luck,  
Mike

Michael Oberhaus  
Superintendent

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

From: Chad Wickard [REDACTED]  
Date: Tuesday, June 7, 2016 at 9:13 PM  
To: [REDACTED]  
Subject: IRB Approval Granted

Dr. Oberhaus,

I am excited to say my research proposal for my dissertation has been given IRB approval, and I am hoping you will be able to grant the approval needed from the district for me to proceed. I have attached my IRB application that discusses the University's housing of the data, and steps taken to ensure privacy of students, and the procedural steps of the data collection and analysis. Please let me know if you need anything else. I have also attached my most recent draft of my Chapter 1 in case you are interested in reading that. It is currently under APA review, but I would love to know your thoughts as well.

All I need is written permission from you as the district representative to proceed. Please let me know if you need any other information for me to proceed. Thank you.

Chad Wickard  
4th Grade Teacher

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

*Preparing today's students for tomorrow's world  
Excellence Everyday*

*"The first responsibility of a leader is to define reality. The last is to say thank you. In between, the leader is a servant." - Max DePree*

## Appendix C

Permission Granted by a Representative of MobyMax®

Friday, March 18, 2016 at 6:52:57 PM Central Daylight Time

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**Subject:** Re: MobyMax Support- Sent By Chad Wickard  
**Date:** Thursday, January 28, 2016 at 2:34:05 PM Central Standard Time  
**From:** Kay  
**To:** chad.wickard@risd41.org

Hi Chad,

Thank you for reaching out. You can certainly use Moby in your research for your dissertation. We wish you the absolute best of luck and hope you'll reach out if you need anything! I'd also love to see a copy when it's finished, if you'd like to send it along :)

Cheers,  
Kay

On Thu, Jan 28 at 2:00 PM , Chad.wickard <chad.wickard@risd41.org> wrote:

Sam,  
Thank you for your response. I am looking simply for permission to use MobyMax as a part of my intervention for my research dissertation. I am looking at the relationship between self-efficacy and reading achievement. I am also looking at mastery experiences, which I believe MobyMax delivers, as a way to improve self-efficacy, which in turn will lead to reading achievement. That is the basic premise of my dissertation, so I need permission to use MobyMax as part of my research. Although I believe it to be minimal, because of the way it works, there is obviously some risk involved if the results do not show the expected growth in self-efficacy or achievement, but I anticipate the results will align to what I have seen this year in my use of MobyMax. Thanks again for helping me find the right person for this request.

Chad Wickard

---

**From:** Sam <[support@mobymax.com](mailto:support@mobymax.com)>  
**Reply-To:** Sam <[support@mobymax.com](mailto:support@mobymax.com)>  
**Date:** Thursday, January 28, 2016 at 11:04 AM  
**To:** Chad Wickard <[chad.wickard@risd41.org](mailto:chad.wickard@risd41.org)>  
**Subject:** Re: MobyMax Support- Sent By Chad Wickard

Hi Chad,

Thank you for writing. We're happy to lend a hand - what exactly do you need from us? Simple permission, or do you need data/stats/history etc? I can forward you to the right person, but the more info I have about your needs, the sooner we can help!

Please do not hesitate to reply to this email or call 1-888-793-8331 if you have additional questions. You can also learn more about MobyMax by reading our FAQ: [www.mobymax.com/Help](http://www.mobymax.com/Help)

Cheers,  
Sam

On Wed, Jan 27 at 7:17 PM , Chad.wickard <[chad.wickard@risd41.org](mailto:chad.wickard@risd41.org)> wrote:  
Who do I contact about using MobyMax in a research capacity for my dissertation?

Page 1 of 2