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Metacognitive Strategies and Scripture Study in Released-Time Seminary

Trevor Scott Pearce
Brigham Young University

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Metacognitive Strategies and Scripture Study in Released-Time Seminary

Trevor Scott Pearce

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

Daniel K Judd, Chair
W. Justin Dyer
Tyler J. Griffin

Religious Education

Brigham Young University

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ABSTRACT

Metacognitive Strategies and Scripture Study in Released-Time Seminary

Trevor Scott Pearce
Religious Education, BYU
Master of Arts

This study asked two questions. First, to what extent can metacognitive strategies instruction increase metacognitive awareness in released-time seminary students? Second, if metacognitive awareness is increased, is this increase correlated with changes in released-time seminary students’ attitudes towards scripture study, their scripture study behavior, how they perceive the quality of their study, and how much they enjoy studying the scriptures?

A control group and two experimental groups were used for this study. Experimental group 1 was taught basic scripture reading strategies without metacognition. Experimental group 2 was taught metacognitive strategies related to scripture study. Students in each experimental group used these strategies for 10 consecutive class sessions. Pre- and post-survey data was collected for comparison.

Statistically significant gains in metacognitive awareness were found when comparing the pre- and post-survey scores of experimental group 2. When comparing experimental group 2 to experimental group 1 and the control group, analysis of covariance (ANCOVA) demonstrated that these gains in metacognitive awareness were not significant by comparison. Students in experimental groups 1 and 2 were asked to rate themselves in the post-survey on the effort they expended utilizing the strategies presented. When students in experimental group 2 who rated themselves high for effort were isolated, an analysis of covariance yielded statistically significant gains for metacognitive awareness in comparison with the other two groups.

The same analyses were performed on measures related to scripture study. While experimental group 2 showed statistically significant gains from pre-survey to post-survey, when analyzed against experimental group 1 and the control group, no significant changes were observed. This was also the case for students who rated themselves high for effort in implementing the strategies presented.

The results from this study suggest that metacognitive strategies can increase metacognitive awareness in released-time seminary students when they put forth the required effort to learn them. Further research in metacognitive application to scripture study is warranted. Qualitative studies with small focus groups could be a valuable avenue of exploration in future studies.

Keywords: metacognition, reading, scripture study, seminary, LDS, reading strategies
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The Church of Jesus Christ of Latter-day Saints places high priority on the practice of personal scripture study. Elder David A. Bednar once asked, “Why is studying the scriptures so important?” He answered: “Sincere study of the scriptures helps us progress in the process of coming unto Christ and becoming more like Him. Through daily feasting, we can gain a testimony of the gospel truths for ourselves and learn to hear and follow the voice of the Lord… One of the best ways to draw near unto Him and to both learn about and become more like the Lord Jesus Christ is to consistently study the holy scriptures—to daily ‘feast upon the words of Christ’” [2 Ne. 32:3] (“Because We Have Them Before Our Eyes,” New Era, April 2006, 2).

Elder D. Todd Christofferson has stated that “The central purpose of all scripture is to fill our souls with faith in God the Father and in His Son, Jesus Christ” (“The Blessing of Scripture, Ensign or Liahona, May 2010, 34). Scripture study, then, helps the Lord “bring to pass the immortality and eternal life of man” (Moses 1:39). It draws us closer to the Lord and makes us more like Him.

The handbook for released-time seminary teachers states that “there are few things teachers can do that will have a more powerful and long-lasting influence for good in the lives of...
their students than helping them learn to love the scriptures and to study them on a daily basis”
(Gospel Teaching and Learning Handbook [2012], 37). Elder Richard G. Scott5 has asked
religious educators to “kindle a love of the scriptures in the mind and heart of each precious
youth. Help ignite within each youth that flame of unquenchable fire that motivates those who
have felt it with a desire to know evermore of the word of the Lord, to understand his teachings,
to apply them, and to share them with others” (“Four Fundamentals for Those Who Teach and
Inspire Youth,” CES Religious Educators’ Symposium, Aug. 14, 1987, 5). It is in the light of
these responsibilities that religious educators seek to help the youth and young adults develop a
life-long relationship with the Word of God.

Despite the emphasis placed on scripture study and the recitation of numerous blessings
that come from careful study of the scriptures, many youth struggle to develop meaningful study
habits or relationships with the scriptures. Students often express that scripture study is boring
and difficult. A student recently wrote, “I have a hard time reading my scriptures because I
never understand them, and I don’t know how to understand what I’m reading better” (Letter to
author, April 21, 2017). Notes like this are common. Archaic language, complexity, and
difficult vocabulary are barriers to a good experience reading and pondering scripture.
Therefore, training on how to read and study the scriptures is necessary to help youth have
positive scripture study experiences. Elder David A. Bednar has stated that “giving a man a fish
feeds him for one meal. Teaching a man to fish feeds him for a lifetime. As parents and gospel
instructors, you and I are not in the business of distributing fish; rather, our work is to help our
children learn “to fish” and to become spiritually steadfast” (“Watching with All Perseverance,”

5 Member of the Quorum of the Twelve Apostles.
Metacognitive strategies applied to scripture study may be one unexplored avenue that can help youth and adults “learn to fish.”

Many of the barriers to scripture reading could be overcome with metacognitive training. Put simply, metacognition is the ability to think about one’s own thinking (Flavell 1979, 906). Metacognition is a skill that allows a learner to recognize how they are learning, self-evaluate the quality of that learning, and then use appropriate strategies to improve their learning. Metacognition is like an instruction manual and a set of tools. Metacognition has been shown to have many positive benefits. Research shows that metacognition can improve reading comprehension (Mokhtari 2017, 189-208), the enjoyment of reading (Zhao and others 2014, 48-55), and the motivation to read (Becker, McElvany, and Kortenbruck 2010, 773-785). One study found that increases in metacognitive awareness are correlated with increases in positive reading attitudes and recreational reading behavior (Kolić-Vehovec, Zubković, and Pahljina-Reinić 2014, 77-98).

Published research specific to metacognitive strategies within the Church of Jesus Christ of Latter-day Saints is a new field of exploration. Observational research does exist on what scripture study strategies Latter-day Saint youth are using (Rackley 2015, 128-147), on scripture reading strategies in general (Joseph Fielding McConkie, “The ‘How’ of Scriptural Study,” [Brigham Young University Education Week Address, August 2006]; rsc.byu.edu), and one researcher has pointed out the need for further exploration in metacognition (Rackley 2015, 146). This study seeks to explore metacognition in a religious setting by asking two questions. First, to what extent can metacognitive strategies instruction increase metacognitive awareness in released-time seminary students? Second, if metacognitive awareness is increased, is this increase correlated with changes in released-time seminary students’ attitudes towards scripture
study, their scripture study behavior, how they perceive the quality of their study, and how much they enjoy studying the scriptures? It was hypothesized that 1.) metacognitive strategies instruction can increase metacognitive awareness and 2.) that increases in metacognitive awareness would be positively correlated with the factors related to scripture study previously mentioned.

To test these hypotheses, a series of metacognitive strategies was introduced to students in released-time seminary programs. These strategies were presented to six different classes over the course of several weeks. A control group was used for comparison, as well as two experimental groups. Experimental group 1 was taught reading strategies without explicit metacognitive training, while experimental group 2 was taught metacognitive strategies applied to scripture study. The aim of this design was to see if the benefits of metacognition could be realized for scripture study in a released-time seminary setting. These findings may be a valuable starting point for further research.
CHAPTER 2
REVIEW OF LITERATURE

In 1979 John Flavell originally defined metacognition as “knowledge and cognition about cognitive phenomena” (906). His research stemmed from his own studies with children and their ability to predict how well they had learned a specific task. He asked participants to memorize a set of items until they felt ready to recall each of them (Flavell 1970, 324-340). He found that the younger the child, the more likely they were to overestimate their own readiness, performing poorly on the memorization task despite declaring they were ready. Older participants knew when they were actually ready and could recall all the items they had been shown. This and subsequent studies conducted by Flavell led him to conclude that young children are poor at understanding their own understanding – they have poor “metacognition” (1979, 909). This conclusion led Flavell and others to investigate further, opening the new field of metacognitive research.

The field of metacognitive research is rapidly growing. One article notes that a Google Scholar search between 1979 (the year of Flavell’s landmark article on metacognition) and 1989 yields only 269 results, while a search from 2002-2012 yields 3,060 citations (Preston, Stewart, and Moulding 2014, 1053-1094). A Google Scholar search conducted December 2017, with advanced search parameters set to find the word “metacognition” in the title of research articles yielded 747 results published between 2015 and 2017. This is an illustration of the numbers generated from an easy-to-use search engine. For this study, research on scholarly databases EBSCO, PsycINFO, PsychArticles, ScienceDirect, and JSTOR was conducted using the search terms “metacognition,” “metacognitive,” “metacognitive strategies,” and “metacognition and
Specific attention was directed towards articles concerning metacognition and reading comprehension, as reading was the primary activity of participants in this study.

Flavell’s original definition of metacognition as “cognition about cognitive phenomena” is often simplified to *thinking about thinking*. Metacognition is not just an awareness of thought, however. Flavell determined that metacognition involves knowledge of one’s cognition *as well as* the ability to both monitor *and* regulate one’s thoughts (1979, 907-909).

Monitoring is the awareness of one’s own cognitive processes. Flavell called this *metacognitive experience* – “an example would be the sudden feeling that you do not understand something another person just said” (1979, 908). An individual who can monitor their own thoughts is aware of when they are learning or not. Monitoring also includes an individual’s knowledge of how effective individual strategies have been and empowers them to regulate (adjust and adapt) as needed.

Regulating is the desired outcome of cognitive monitoring. Regulating is the ability to adapt learning strategies in accordance with monitoring. Flavell originally referred to this as “metacognitive actions (or strategies)” (1979, 906). Someone who is a good regulator not only evaluates how well they are learning (monitoring) but can adjust their strategies to increase learning if their comprehension is low (regulation). For example, a student may recognize that a chapter in their chemistry book is more challenging than previous chapters. As the student recognizes this fact, they know that their prior cognitive strategy of underlining text while reading and taking a few notes will not be enough to produce good comprehension (monitoring). Instead of continuing with a cognitive strategy that the student predicts will be less effective, the student prepares flash cards of all relevant information and equations and has a roommate quiz them several times before class (regulating). This student knows that flash cards and practice
quizzes have been effective cognitive strategies in the past and anticipates that this approach will be enough to get a good score the next time they are tested on this material. This example demonstrates how metacognition itself is not a cognitive strategy, but the ability to apply different cognitive strategies in appropriate situations (regulation) through awareness of one’s own learning processes (monitoring).

Not only have monitoring and regulating been shown to increase test scores in general chemistry courses (Zhao and others 2014, 48-55; Cook, Kennedy, and McGuire 2013, 961-967), but these metacognitive skills also have been shown to have positive impacts in the following areas: law (Preston and others 2014, 1053-1094); social studies (Stewart, Rasmussen, and Okey 2015, 77-84); reading (Mokhtari 2017; McGuire and McGuire 2015; Wilson and Conyers 2016), language acquisition (Klingner and Vaughn 1999, 738-747); vocabulary building (Boulware-Gooden and others 2007, 70-77; Carr 2017, 684-689); and scripture study (Rackley 2015, 128-147).

**Metacognition vs Cognitive Strategies**

It is important to differentiate between metacognition and cognitive strategies. A cognitive strategy is any technique used to learn, like making flashcards or looking up definitions when reading unfamiliar words. Metacognition recognizes if these strategies are working, dictates when and how to use them, and evaluates their effectiveness and potential for future use. The sport of basketball can be used as an illustration to compare a reader whose goal is to comprehend a text using cognitive strategies and metacognition.

The point guard on a basketball team (a reader) is determined to score points (comprehension). Through practice a point guard has developed a variety of skills and his team has practiced several plays (reading comprehension strategies). In the middle of a fast-paced
game, however, the point guard will need to know which plays are appropriate at which times, how effective those plays are against their opponent, how well his or her teammates are performing, how well their own skills match up against the opposing team, and how, where, and when to adapt their strategies if they aren’t working (metacognition). This in-game monitoring and regulation of skills and plays is the same thing that competent readers must develop to navigate difficult texts. If a point guard thinks, “The last three times we’ve run that play, the other team has stopped our forward from scoring. We better run some different plays until that defender isn’t suspecting this one again,” they are monitoring the effectiveness of their strategy and regulating their approach. This is metacognition at work.

The lines between a cognitive strategy and metacognition are often blurred, but it is important to understand the distinction. Using this basketball analogy, it would be impossible for a point guard to determine which plays to use, analyze their effectiveness, and adapt as needed without metacognition. The point guard needs to know the plays in the first place, but analyzing their sequence and effect takes those plays to the next level. In other words, it’s almost impossible to have metacognition without a cognitive strategy attached, but they are not the same thing. It is important to have both, as metacognition builds upon cognitive learning strategies. Wilson and Conyers state that “the goal of teaching students to be metacognitive is to guide them to consciously, and with increasing independence, recognize when and how to employ cognitive strategies that work best for them across various situations” (2016, 9).

Metacognition may be the key to successful strategy use.

*The Benefits of Metacognition*

The phrase “Give a man a fish, and you feed him for a day; show him how to catch fish, and you feed him for a lifetime,” is a popular saying that captures the power of metacognition.
Metacognitive students are more self-sufficient learners, empowered with the ability to recognize how they are doing and seek out solutions to problems as they work (McGuire and McGuire 2015, 16). Instead of feeding information to students or telling them what to learn, metacognition teaches students how to learn. Metacognition is teaching students to fish, instead of giving them the information that they are expected to know.

The power in metacognition is that it benefits a wide range of students with different abilities. One study determined that metacognition was the number one shared characteristic of high academic achievers (Wang, Haertel, and Walberg 1993, 249). Hattie determined that out of 150 factors that influence student achievement metacognition ranked at number 15, while socioeconomic status (a typical correlate of student achievement) ranked at number 45 (2012). Wilson and Conyers conclude that “the academic performance of most children and teenagers, whatever their current levels of achievement, can be enhanced by explicit instruction on the use of metacognitive and cognitive strategies” (2016, 5). To further this argument, Berkeley, Mastropieri, and Scruggs demonstrate that students with learning disabilities who were taught metacognitive reading strategies experienced marked improvements in their abilities (2011, 27-30). In another article, Gregory Schraw points out that metacognition benefits a wide range of students regardless of their IQ (1998, 116).

Because metacognition is an internal, cognitive ability, its application can be utilized across learning disciplines. For example, several researchers have found metacognition to be a powerful tool to help elementary students increase their vocabulary comprehension and retention (Boulware-Gooden and others 2007, 72; Carr 1985, 685). Stewart, Rasmussen, and Okey introduced a set of metacognitive prompts to help social studies students in secondary education
classes observed that students engaged in the metacognitive prompts performed better and showed marked increases in their engagement throughout the lecture (2015, 82).

Drs. Cook, Kennedy, and McGuire of Louisiana State University offered a metacognitive supplement to almost 700 students enrolled in a general chemistry class (2013, 961). Students were free to choose whether to attend the metacognitive lecture with the only reward for attending a promise of better test scores in the future. In a single 50-minute lecture (delivered after many of the students had performed poorly on their first test), these professors explained that their study skills were currently inadequate, presented a variety of metacognitive strategies for learning, and had the students commit in writing to use of metacognitive strategies in their future studies. After determining that there were no statistical differences in prior academic performance between the students who self-selected to attend the lecture and those who did not, these researchers determined that students who attended the lecture on metacognitive strategies earned, on average, a whole letter grade higher than their counterparts (2013, 965). They conclude that “college students who do not have the requisite [metacognitive] learning strategies to succeed in general chemistry can be taught these [metacognitive] strategies in as little as 50 minutes.” They also state that “when students start using the strategies and experience greater understanding and success, they are motivated to continue, and their performance continues to improve” (2013, 965). Cantrell and others also note this type of instruction increased motivation for both 6th and 9th grade students, even when achievement gains were low (2016, 17). This demonstrates the power of metacognition in turning students into “fishers” instead of passive learners.
Measuring Metacognition

Measuring metacognition is difficult because it is impossible to directly record what someone is thinking. It’s also difficult to measure by its outcomes. For example, one anticipated outcome of metacognition is that someone will have greater reading comprehension. The degree of metacognition, however, is not directly correlated to reading comprehension. It is possible to have a high degree of metacognition but score very low on a reading comprehension test. The individual would simply be aware that they had not understood the text. It is also possible to score very high on a reading comprehension test with low metacognition. This happens when a student is able answer questions correctly by finding the correct information, but they aren’t aware of how they are learning, nor do they evaluate the effectiveness of their methods. They may use the same method repeatedly with good results, only to be stumped as to why they scored poorly on a later, more difficult test that demanded alternate strategies.

A better measure of metacognition is what researchers call *metacomprehension accuracy*. Metacomprehension accuracy refers to how precisely a student understands their own understanding of a given text, and how well they will perform on an exam of that material (Thiede, Anderson, and Therriault 2003, 66). A student with high metacognition may study well for their test and know they were prepared and accurately predict they would get an A on the exam. A student who accurately predicts poor performance on an exam also has high metacomprehension accuracy, despite the low test score. Accuracy requires metacognition, because it requires the student to be aware of how well they understand what they are reading or studying. A student with good metacognitive skills can recognize that they have failed to comprehend a text well enough to answer questions that might appear on a quiz. In practice a student with good monitoring skills will also be able to regulate their learning by adjusting their
approach to the text to increase comprehension. Wiley and others found that students with low metacognition also demonstrate low metacomprehension accuracy, often overestimating how well they will do on reading comprehension questions (2016, 399). Wiley’s participants were introduced to a short metacognitive strategy prior to reading a text. Students in the intervention group showed statistically significant gains in their ability to predict their performance in comprehension tests over control groups (2016, 399).

The Metacognitive Awareness Inventory (MAI) and the Metacognitive Awareness of Reading Strategies Inventory (MARSI) have both been developed to measure an individual’s metacognitive abilities. The Metacognitive Awareness Inventory (MAI) is an extensive 52-question self-report instrument with 8 subcategories of metacognitive distinction, thoroughly tested for reliability and validity (Schraw and Dennison 1994, 460-470). To assess participants metacognitive knowledge and their ability to regulate, the MAI asks participants questions like the following: “I ask myself periodically if I am meeting my goals,” “I know how well I did once I finish a test,” and “I think of several ways to solve a problem and choose the best one” (Schraw and Dennison 1994, 473). These questions are answered on a scale from 0-100, which the researchers hoped would allow for a greater degree in the variety of answers, prompting more valid results. Schraw and Dennison began with 120 questions and worked their way down to the 52 most reliable and valid.

When creating the MAI, Schraw and Dennison were particularly interested in claims by other researchers (including Flavell) that metacognition could be broken down into two mutually reinforcing concepts; the knowledge of one’s own cognition and the ability to regulate cognition (Schraw and Dennison 1994, 462). Schraw’s findings using the MAI indicate that this is true – knowledge of cognition and regulatory control of cognition seem to work together, reinforcing
each other (Schraw and Dennison 1994, 466). Using the MAI Schraw and Dennison also found that subjects with higher metacognition (according to the MAI) were better at predicting their own performance on a comprehension test, and performed better overall (Schraw and Dennison 1994, 471).

The Metacognitive Awareness of Reading Strategies Inventory (Marsi) was developed by Kouider Mokhtari and Carla Reichard to measure metacognition in an adolescent population, grades 6-12 (2002, 251). The 30-question, Likert-scale instrument can be taken in about 10 minutes. Unlike other measures of metacognition, the MARSI was created specifically to be used by teachers to “assess 6th – through 12th- grade students’ awareness and perceived use of reading strategies while reading academic or school-related materials” (Mokhtari and Reichard 2002, 251). The questions in the MARSI naturally reflect strategies and cognition related to the task of reading. While Mohktari and Reichard acknowledges that there are always issues with self-report instruments, the MARSI can help students increase “awareness of their own comprehension processes while reading” which is “an important first step toward their becoming constructively responsive, strategic, and thoughtful readers” (2002, 256). As much as this instrument can be used to measure the metacognitive awareness and regulation of students, it can also be used as a tool to help increase these very factors by the students who take it.

Implementing Metacognition

Because metacognition demands an awareness of learning as well as the ability to regulate learning by selecting effective cognitive strategies, a learner must be taught how to monitor their own thoughts and a how to use cognitive strategies to maximize learning. Because everyone thinks differently, researchers and classroom teachers generally use a variety of methods to increase both metacognitive awareness (monitoring) and the application of cognitive
Because regulating demands that a learner select cognitive strategies that are most effective for them, helping a student learn to regulate demands teaching a variety of cognitive strategies. Pressley and others found that while one single cognitive strategy can increase reading comprehension in elementary students, teaching multiple strategies creates a statistically significant gain in comprehension (1998, 175). For this reason, a large body of metacognitive research focuses on curricula or instruction designed to increase metacognition through cognitive strategies instruction, and then examines the effect that increased metacognition has on learning (Mokhtari, 2017; Isakson and Isakson, 2017; McGuire and McGuire, 2017; Wilson and Conyers, 2016).

In one example, Zhao, Wardeska, McGuire, and Cook gave one lecture to college students on the definition and benefits of a metacognitive approach in studying, then used a survey of metacognitive learning strategies to promote increased awareness and application of the variety of strategies in the survey itself (2014, 48-55). Exam scores for students who reported greater use of these metacognitive strategies showed significant improvement. The lecture given to students in this study was minimal, and the strategies were not discussed in detail, but by exposing students to the concepts of monitoring and empowering them with the tools needed to regulate, students were able to improve their exam scores. This study demonstrates the power and efficacy of a broad metacognitive approach to learning. This research also demonstrates that a variety of cognitive strategies facilitate metacognition, and that the ability to learn metacognitively produces greater results than individual reading strategies. Kostons and van der Werf also found that the metacognitive strategy of activating prior knowledge – determining what a participant already knows about the topic that is about to be studied – produced no statistically significant effect when compared to activating participants’
metacognitive knowledge (2015, 270-272). Once participants were reminded of what they knew about metacognition, they were able to monitor and regulate efficiently. In this case, being reminded of metacognition generally was as helpful as a specific metacognitive strategy. This demonstrates that metacognitive knowledge is a more powerful tool than individual cognitive strategies, even when these cognitive strategies may have metacognitive components.

A common thread in research literature is that metacognitive awareness and application involves planning (what a learner does before a learning task), monitoring/regulating (what they do during a learning task), and evaluating the efficacy of their learning and making judgments about how well they have understood (see Boulware-Gooden and others 2007; Schraw and Dennison 1994; Schraw 1998; Stewart and others 2015). Within this pattern are a variety of implementations to help individuals process information more metacognitively. Stewart, Rasmussen, and Okey used a set of generic questions designed to elicit a metacognitive response before, during, and after social studies lessons to increase metacognition (2015). Boulware-Gooden and others implemented a reading comprehension curriculum in two schools for 25 days, 30 minutes each day. At one school, teachers were trained in a variety of methods to help the students think metacognitively before, during, and after the 30-minute curriculum lesson. Teachers activated students’ prior knowledge, used semantic webs, metacognitive questions, and metacognitive summary exercises. They found that approaching a standard reading comprehension program in a metacognitive way “significantly improved academic achievement” (Boulware-Gooden and others 2007, 77).

Other researchers have attempted to isolate individual cognitive strategies to determine their overall effect on metacognitive ability and learning. Redford and others used concept maps to see if metacomprehension accuracy could be improved (2012, 264). They determined that
students engaged in the metacognitive task of concept mapping had significantly greater metacomprehension accuracy than students in the control group who were engaged in rereading exercises (Redford and others 2012, 268). In other words, students engaged in concept mapping had a better understanding of their own understanding.

Thiede and Anderson asked college students to read a passage of text with the assumption that they might be asked to summarize what they learned. Participants who were asked to summarize material after a short delay demonstrated higher metacomprehension accuracy than participants who either did not summarize, or summarized immediately following the reading task (2003, 70-71). This study demonstrates that delayed summarization is a metacognitive strategy that helps participants identify the degree to which they have understood a text. Eileen Carr concluded that the metacognitive strategy of relating vocabulary words to personal experience increases retention of words in adults and high school students (1985, 685). Wiley and others found statistically significant gains in metacomprehension accuracy when students were exposed to the strategies of self-explanation and test-expectancy (2016, 399).

The studies that isolate individual metacognitive strategies measure the effect of that strategy in metacomprehension accuracy. This is because researchers are trying to determine if that specific strategy has led participants to monitor their learning, thus increasing their ability to predict how well they will perform under a variety of test conditions. This is good, but only one part of the metacognitive equation. A participant engaged in an individual metacognitive strategy might predict that their performance on a test will be very poor, then perform poorly, demonstrating a high degree of metacomprehension accuracy. While individual strategies can produce greater metacomprehension accuracy, only a variety of available strategies encourage metacognitive regulating, allowing for individuals who recognize a deficiency in their learning to
choose strategies that will increase learning. This is why research involving teachers in classrooms with real students includes a variety of strategies that students can choose from. This allows them not only to monitor, but to regulate their learning in a fashion that increases comprehension on an individual basis.

Metacognition and Reading

Kouider Mokhtari, developer of the Metacognitive Awareness of Reading Strategies Inventory, has compiled some of the most current research on metacognition and reading in a book titled *Improving Reading Comprehension Through Metacognitive Reading Strategies Instruction*. In his forward, Mokhtari concludes that metacognitive reading strategies have “proven to be most effective to improve reading comprehension (2017, ix). Zhao and others conclude from their research that metacognitive reading instruction can increase both reading comprehension and the enjoyment of reading (2014, 48-55). Becker, McElvany, and Kortenbruck determined that intrinsic reading motivation is positively correlated to reading literacy later in life (2010, 782). These researchers also stated that motivation is correlated to reading competency or achievement, and that there is a “substantial effect of prior achievement on later motivation,” and that, “from a theoretical point of view, the problem is thus not always that students fail to learn because they lack motivation; rather, students lack motivation because they do not experience progress and competence” (2010, 783). Metacognition is an arena where students can be led to experience progress and competence in learning.

In a 2015 study, Susan Chambers Cantrell and others explored the relationship between reading achievement and motivation in sixth- and ninth-grade students. Students received supplemental metacognitive reading-strategies instruction over the course of the school year. Cantrell and her colleagues found that the ninth-grade students experienced significant
improvements in reading achievement, and both the sixth- and ninth-grade students showed statistically significant improvements in motivation (2015, 17). Cantrell also illustrates how reading motivation and achievement create a bidirectional relationship, each mutually reinforcing the other, concluding that the increase in motivating for sixth-graders will “pay off in terms of improved reading achievement over time” (2015, 18). Kolić-Vehovec, Zubkovičand, and Pahljina-Reinić explored the relationship between metacognitive skill, reading comprehension, and reading attitude. They found that while metacognitive knowledge is correlated with increased reading comprehension, both factors increase positive reading attitudes, perceptions of self-efficacy, and recreational reading (2014, 93).

Hong-Nam, Leavell, and Maher explored the relationship between metacognition and reading strategies by administering several assessments to high school students in Texas (2014, 768). Students in this study had been exposed to a reading-strategies curriculum between one and four years, depending on how long they had attended the school. These researchers found that there was a positive correlation between the amount of instruction received (years at the school), their self-reported scores for metacognitive awareness and strategy use on the Metacognitive Awareness of Reading Strategies Inventory (MARSİ), and their performance on a standardized reading-achievement test administered in the state of Texas (Hong-Nam and others 2014, 782). Hong-Nam, Leavell, and Maher also note that, while some reading strategies are not inherently metacognitive, the highest-achieving students used the widest variety of strategies, and were more likely than others to choose metacognitive strategies (2014, 784-785). Correlation is not causation, but it is worthwhile to note that use of metacognitive strategies and high reading-achievement are strongly correlated.
Several methods can be used to assess a reader’s metacognitive monitoring and regulation during a reading task. The Metacognitive Awareness of Reading Strategies Inventory (MARSI) mentioned previously is a quantitative measure of metacognitive monitoring and regulation during reading. All self-report measures have some issues, as participants may not answer truthfully to every question. Another method of measuring metacognitive monitoring and regulation during reading is to ask readers to verbalize their thoughts as they are reading in an exercise often referred to as a ‘think-aloud.’ Emily Fox used think-aloud exercises to determine that successful and skilled readers employ a variety of metacognitive strategies while reading (Mokhtari, 2017, 28). Metacomprehension accuracy can also be used as a measure to assess metacognitive monitoring and regulation. Thiede and Anderson found that when students were asked to read a text and then summarize it after a delay (prompting a more metacognitive response than writing a summary immediately after reading a text), their metacomprehension accuracy rose (2003, 152).

Metacognition is not a learning strategy, but a cognitive ability. Wilson and Conyers, researchers and practitioners of metacognition state that “metacognition is an essential, but often neglected, component of 21st century education that teaches students how to learn” (2016, 7). For example, a teacher may ask a student to take notes on a chapter and then use a journal to reflect on what they have learned in that chapter. The writing exercise in the journal is not metacognitive if the students only take notes. It becomes metacognitive when students are asked to reflect on 1) how they learned the material, 2) how well they have learned the material, 3) which strategies were chosen and why, 4) which strategies were most effective and 5) what they might do differently in the future, if anything. Knowing the how of learning makes an activity metacognitive (Preston and others 2014, 1067).
In a paper titled, “How Young Latter-day Saints Read the Scriptures: Five Profiles,” Dr. Eric Rackley points out that “there is a noticeable lack of research that explores Latter-day Saint youths’ literacy practices” (2015, 128). In his study Rackley identified the strategies that LDS youth employ to understand the scriptures. While Dr. Rackley discovered five different types of strategies and discussed their implications, he also did something else that was very interesting. To discover what strategies youth employ, he conducted qualitative research by asking his participants to “verbalize what they were thinking” as they read out loud from selected scripture passages (2015, 140). This activity, often known as a “think-aloud,” is a teaching technique that elicits metacognition. Rackley writes that he did not want to “influence the manner in which they [the participants] read the [scripture] passages,” but admits in the conclusion of his paper that each of the participants “spoke favorably about the effects of verbalizing and thinking on their understanding of the self-selected chapter.” Notably he states that many of the strategies delineated in this study seemed to fall short of true learning. He used phrases like, “read with little or no additional investigation of the text,” and a certain participant’s comments constituted an “end-point of her line of thinking, indicating that making an intellectual observation could mark the culmination of her scripture reading” (2015, 146). The think-aloud exercise, however, elicited comments from participators about their own realization of how little they understood, and remarks that it helped them clarify their thinking, to “read more carefully,” and “take a closer look at [the scriptures]” (2015, 147). By investigating how LDS youth read scripture, Rackley inadvertently introduced a metacognitive component that seemed to have a positive effect on the participants understanding of scripture. One reported that after thinking aloud, the scriptures “make sense now” (2015, 147). This demonstrates that metacognition can be a
powerful tool that can enhance whatever reading strategies students may already be employing. It reinforces the idea that focusing solely on strategies produces a minor effect but focusing on the metacognitive component appears to elicit a more substantial response.

In another related study, John Hilton III investigated motivation for scripture reading. In his conclusion, he questions why some study sessions in the scriptures are better than others. He recommends that students ask themselves if they “notice any patterns around why some study sessions are better than others” and that “providing students an opportunity to reflect on their study may prompt important insights and help develop future metacognitive strategies” (2016, 108-119). In this statement Hilton recognizes the power that metacognitive monitoring could have on the regulatory ability of scripture readers. Ellis, Denton, and Bond found in their analysis of research on metacognitive teaching strategies that verbalizing out loud or internally increased participants’ ability to regulate their learning on academic tasks (2014, 4019). They also conclude that one of the most common forms of explicit instruction in metacognitive techniques is for the teacher to model strategies while thinking out loud, and then require students to think aloud as they learn the strategy for themselves (2014, 4020). Both Rackley and Hilton’s conclusions fall in line with what modern educational research in metacognition would suggest.

LDS religious educators have been teaching reading strategies to students for over 100 years. Little research has been done on exactly how students study the scriptures, let alone the effect of individual reading strategies on scripture reading outcomes. What is apparent from the studies that have been done, however, is the strategies seem secondary to the students’ ability to process their own thoughts as they read. In a similar vein, prophets and apostles have long counseled church members not only to read the scriptures, but to ponder them as well. While
pondering has always been a companion activity of scripture study, little instruction on how to ponder has been given, opening another avenue in which metacognition may play an important role.

Elder Scott D. Whiting\(^6\) spoke to LDS Business College students in November of 2017, stating that “pondering is a spiritual principle that is often spoken of in scripture and by prophets, seers and revelators, but I have learned that not many of us know how to ponder or how to do so with the degree of effectiveness that will unlock the desired results” (Valerie Johnson, “Seventy Identifies Four Steps for Pondering That Can Lead to Personal Revelation,” *Church News*, Nov. 8, 2017). Elder Whiting went on to outline steps describing how to ponder, such as have a distraction-free environment, have a desire or purpose to reading scripture, repeatedly think over what was read, and have a mind engaged in an “active process.” While Elder Whiting outlines the process of pondering, he spends most of his talk on the importance and blessings of pondering rather than breaking down how this process actually looks like. For example, he mentions that we should have our minds engaged in an “active process,” but doesn’t explain how to do it. Metacognition may be one way to help members of the Church deeply ponder the scriptures by engaging their minds in an “active process.”

Elder Marvin J. Ashton\(^7\) taught that “pondering is a progressive mental pursuit. It is a gift to those who have learned to use it” (“‘There are Many Gifts,’” *Ensign*, Nov. 1987). The process of pondering scripture can be enhanced through metacognition. Metacognition should lead to internalization of what is read and the personalization of the content through monitoring and regulating.

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\(^6\) Member of one of the Quorums of the Seventy.  
\(^7\) Member of the Quorum of the Twelve Apostles 1971-1994.
The self-awareness that comes from metacognition is a new field of inquiry when it comes to scripture study. This exploratory study tested two hypotheses. The first hypothesis was that metacognitive strategies instruction would increase metacognitive awareness in released-time seminary students. The second hypothesis was that increasing metacognitive awareness is correlated with changes in released-time seminary students’ attitudes towards scripture study, their scripture study behavior, how they perceive the quality of their study, and how much they enjoy studying the scriptures.
CHAPTER 3
METHODOLOGY

To test the previously stated hypotheses, a quantitative design using Likert-scale survey data was used to measure metacognitive awareness and elements related to scripture study. The Metacognitive Awareness of Reading Strategies Inventory (MARSI) was created as a measurement for participants ages 11-18 and assesses metacognitive strategies awareness specific to reading (Mokhtari and Reichard, 2002). Questions relate to both a knowledge and use of metacognitive strategies. A Survey of Student Scripture Study was developed by the researcher to examine participants’ attitudes, behaviors, and perceptions regarding scripture study. These surveys ask participants to rate their responses on a scale from 1 to 5 and take about 10 minutes to complete.

Participants

Participants for this study came from released-time seminary classes in Kaysville, Utah. Demographics such as age or gender were not collected. Released-time seminary teachers are constrained to teaching entire classes of mixed age, gender, race, and socio-economic status. The aims of this study were to see the impact of metacognitive instruction on entire classes of participants, therefore identifying information was not collected. However, the mixture of students in each class was randomly assigned by a computer program that sorted students into classes of equal ratios of gender and grade. Future research using demographics as covariates would be valuable.

Two released-time seminary teachers (in addition to the researcher) volunteered to help conduct the research. Each of these teachers’ six classes were assigned a number, 1-18. Two of
these classes were randomly assigned to experimental group 1 and five to experimental group 2. Three classes were randomly assigned to the control group. The remaining 8 classes were not used. Due to constraints, a limited number of classes were available for study. A random-number generator was used to select classes for each condition. Classes consisted of approximately 30 students each, with entire classes assigned to either the control group or experimental groups 1 or 2. Each teacher (including the researcher) had one control class. In addition, the researcher had two classes assigned to experimental group 1, and two classes assigned to experimental group 2. One teacher had two classes from experimental group 2, and the other had one from experimental group 2. Having additional teachers in addition to the researcher was a design choice to mitigate the threat to validity caused by the researcher presenting the intervention.

After random assignment and attrition, this created a control group of 36 students (N = 36), an experimental group 1 of 19 students (N = 19), and an experimental group 2 of 81 students (N = 81). More attrition than expected occurred during this experiment, causing an exceptionally low number of students in experimental group 1. One of the classes selected for experimental group 1 was also smaller than average. Smaller numbers, however, lead to a more statistically conservative estimate of the effects of metacognitive training.

Attrition was caused by several unexpected factors. Many students simply chose not to participate, and others would not return parental consent forms. For these reasons, this study lost 12 students from the control group, 20 from experimental group 1, and 6 from experimental group 2. Students were asked to assign their pre-survey the last four digits of their personal cell phone number. When the post-survey was administered weeks later, many students were unable to recall the four-digit number from their pre-survey, having chosen to use a number different
than the last four digits of their personal cell phone. Due to inaccuracy in or lack of post-survey reporting, 40 participants were lost from the control group, 19 from experimental group 1, and 69 from experimental group 2. This level of attrition was much higher than expected by the researcher. In future research with teenage participants, more care will be taken to connect pre- and post-survey data.

The control group in this study did not receive any treatment. The control group received the pre- and post- surveys to account for any development of metacognitive ability through routine classroom instruction. Experimental Group 1 (N = 19) received basic reading strategies instruction, but without any explicit metacognitive instruction. Experimental Group 2 (N = 81) received metacognitive strategies instruction in addition to basic reading strategies. Using two experimental groups was a design choice used to examine differences between metacognitive strategies, general reading strategies, and standard released-time seminary instruction. The intervention for experimental groups 1 and 2 lasted for 12 class sessions, or just over four school weeks with participants attending class every other day. After the intervention concluded, classes in the control group and experimental group 1 were taught the metacognitive components of the intervention so they were not denied any benefit from the treatment.

**Instruments**

To determine if metacognitive strategies instruction increased metacognitive awareness, the Metacognitive Awareness of Reading Strategies Inventory (MARSI) was selected. The inventory asks 30 questions that investigate participants’ global reading strategies, problem-solving strategies, and support reading strategies. These categories are especially valuable because they determine how this intervention impacted students and their understanding or application of metacognitive strategies. The global strategies portion determines if students are
predicting, previewing, using context for clues, etc. The problem-solving strategies section determines if students read carefully, regulate their strategies, or ponder what they are reading. The support reading strategies determines if participants engage in note-taking, annotating, and using study aids (see appendix).

To establish a baseline for elements related to scripture study, a Survey of Student Scripture Study (SSSS) was developed by the researcher. This survey made it possible to analyze if changes in metacognitive awareness as measured by the MARSI were correlated with changes in elements related to scripture study. The SSSS is a Likert-scale survey that assesses students’ attitudes and behavior regarding scripture study, how they perceive the quality of their own study, and how much they enjoy reading the scriptures. The SSSS contains questions that were piloted on small test groups of students to improve their clarity and relevance (see appendix). Data collected from the MARSI was tested for reliability at $\alpha = .95$, and from the SSSS at $\alpha = .97$.

Student anonymity on both surveys was protected by asking participants to provide only a unique four-digit number (the last four digits of their personal cell phone number – a data point that is not on record with released-time seminary programs).

Procedure

Participants in both experimental groups and the control group were given both the MARSI and the SSSS before and after the intervention. Teachers participating in the intervention administered these surveys to their own classes as part of routine instruction. Participants spent approximately 10 minutes taking each survey.

Once the pre-surveys were administered, a short lesson on metacognition, it’s importance, and how metacognition could be used to better understand the scriptures was taught
to experimental group 2. Teachers were trained in how to deliver this lesson, and a detailed lesson plan was provided (see appendix). Students were taught the concept that every reader can benefit from metacognitive reading strategies and thereby improve their experience with the scriptures. Real-life examples and some hands-on demonstrations of the value of metacognition were provided to help generate excitement and interest.

Students in experimental group 1 were taught basic reading strategies on previewing, comprehending, and reviewing a text. They were told that using these strategies might increase their positive experiences with the scriptures and help them get more out of their study. A handout detailing these reading strategies was provided to each student for reference (see appendix). The control group received standard released-time seminary lessons with no additional reading strategies or metacognitive instruction. After 12 class sessions (between four and five weeks of classroom instruction), the MARSI and SSSS were again administered to students in the control group and both experimental groups, with the same identifying information collected. Results were analyzed to determine if there were changes in pre- and post-survey scores for each group. An analysis of covariance (ANCOVA) was conducted to determine if changes within individual groups were significant in comparison with other groups.
CHAPTER 4

RESULTS

The first hypothesis of this study was that instruction in metacognitive strategies would increase metacognitive awareness in released-time seminary students. The second hypothesis was that an increase in metacognitive awareness was correlated with changes in released-time seminary students’ attitudes towards scripture study, their scripture study behavior, how they perceive the quality of their study, and how much they enjoy studying the scriptures.

For each survey, data from each participant was averaged to give an overall mean score. For example, on the MARSI, participant #3724 averaged 2.44 for all answers on the MARSI given prior to the intervention. The MARSI and SSSS also designate subcategories as well, and means were calculated for each participant in every subcategory. Pre- and Post-survey scores were also compared by subtracting the pre-survey mean scores from the post-survey mean scores. This difference indicates the mean change after intervention. Scores with a negative number indicate an overall decrease in mean score, while scores with a positive number indicate an overall increase in mean scores from pre-survey to post-survey. For example, a decrease in mean score on the MARSI indicates that a participant rated themselves lower for metacognitive awareness and application after the intervention.

Change in Metacognitive Awareness Within Groups: Pre-/Post-Survey Comparison

The first hypothesis was tested by discovering to what extent metacognitive strategies instruction increased participants metacognitive awareness. First, changes in pre- and post-survey scores for the MARSI were analyzed to determine if any individual group experienced significant changes in scores. A paired-samples $t$ test was conducted by group for each survey,
and every subcategory within these surveys. Significance levels for all t tests were set at $p = .05$ (see table 1).

To establish if metacognitive awareness improved through standard released-time seminary instruction, pre- and post-survey scores were compared for the control group. No change between pre- and post-survey scores was hypothesized for this group. In this sample ($N = 36$), mean change scores for the Metacognitive Awareness of Reading Strategies Inventory (MARSI) increased between testing from $M = 3.21$ to $M = 3.38$, however, this change was not significant $t (35) = 1.46, p = .15$.

To establish if metacognitive awareness could be improved through general reading strategies instruction, pre- and post-survey scores were compared for experimental group 1. In this sample ($N = 19$), mean change scores for the overall MARSI score increased between testing from $M = 3.11$ to $M = 3.37$. This score includes all three subcategories of the MARSI. This change was statistically significant $t (18) = 2.46, p = .02$. Of all subcategories on the MARSI, the only subcategory with statistically significant changes was the problem-solving category. In problem-solving, scores between testing increased from $M = 3.64$ to $M = 3.93$, with a significance value of $t (18) = 2.42, p = .03$.

To determine the degree to which metacognitive strategies instruction changed metacognitive awareness, pre- and post-survey scores were compared for experimental group 2. Moderate positive change between pre- and post-survey scores was hypothesized for this group. In this sample ($N = 81$), mean change scores for the MARSI increased between testing from $M = 2.99$ to $M = 3.39$. This change was statistically significant $t (80) = 6.47, p < .001$. Statistically significant changes were found for each of the three subcategories on the MARSI as well. The
results from these paired-samples $t$ tests support this study’s first hypothesis, that metacognitive strategies instruction would increase metacognitive awareness.

**Table 1 – Changes in Metacognitive Awareness Within Groups**

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Pre-survey M</th>
<th>SD</th>
<th>Post-Survey M</th>
<th>SD</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARSI Overall</td>
<td>3.21</td>
<td>0.56</td>
<td>3.38</td>
<td>0.77</td>
<td>1.46</td>
<td>.15</td>
</tr>
<tr>
<td>Experimental Group 1</td>
<td>Pre-survey M</td>
<td>3.11</td>
<td>0.35</td>
<td>Post-Survey M</td>
<td>3.37</td>
<td>0.57</td>
</tr>
<tr>
<td>MARSI Overall</td>
<td>2.99</td>
<td>0.62</td>
<td>3.39</td>
<td>0.69</td>
<td>6.47</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

**Change in Metacognitive Awareness Between Groups**

Although the metacognitive intervention produced more consistent results in experimental group 2, it was necessary to determine if this difference was significant in comparison with the control and experimental group 1. Using the pre-test scores as a covariate, each group was analyzed against the others for significant changes in mean difference scores in each subcategory and for overall scores. Significance values for all analyses of covariance (ANCOVA) were set $p = .05$.

For the MARSI, the control group ($N = 36$) had a mean change score of 0.17, for experimental group 1 ($N = 19$) the mean change score was 0.26, and for experimental group 2 ($N = 81$) the mean change score was 0.40. Levene’s test of equality of error variances had a significance value of $p = .242$, suggesting a homogeneity of variance. In tests of between-subjects effects, $F (2, 132) = 1.11, p = .33$, suggesting that no statistically significant difference exists between groups (see table 2). No statistically significant results were found for individual subcategories on the MARSI.
Table 2 – Change in Metacognitive Awareness Between Groups

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>5.404*</td>
<td>3</td>
<td>1.801</td>
<td>5.528</td>
<td>.00</td>
<td>.112</td>
</tr>
<tr>
<td>Intercept</td>
<td>6.421</td>
<td>1</td>
<td>6.421</td>
<td>19.705</td>
<td>.00</td>
<td>.130</td>
</tr>
<tr>
<td>MARSI_Overall_Pre</td>
<td>3.978</td>
<td>1</td>
<td>3.978</td>
<td>12.209</td>
<td>.00</td>
<td>.085</td>
</tr>
<tr>
<td>Group</td>
<td>.725</td>
<td>2</td>
<td>.363</td>
<td>1.113</td>
<td>.33</td>
<td>.017</td>
</tr>
<tr>
<td>Error</td>
<td>43.012</td>
<td>132</td>
<td>.326</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>62.586</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>48.416</td>
<td>135</td>
<td></td>
<td></td>
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</tbody>
</table>

In addition to statistical significance or power, effect size was also calculated between groups. Effect size is an important calculation in this study because of the small sample size in both the control group and experimental group 1. A moderate effect size was found between the control group and experimental group 2 on the MARSI ($d = .35$), and between experimental group 1 and experimental group 2 on the MARSI ($d = .28$). On the MARSI, a small effect size between the control group and experimental group 1 was observed ($d = .14$). These results suggest that metacognitive instruction produces greater positive gains in metacognitive awareness than general reading strategies, supporting hypothesis one.

Change in Metacognitive Awareness for Participants Adhering to Treatment

To determine if the effort put forth in learning metacognitive strategies influenced statistical outcomes, one more analysis was performed. On the SSSS post-survey for the experimental groups, participants were asked to rate their effort on a scale from 1 to 5. The question was, “I put forth a good effort in trying the reading strategies presented to me for this
study over the last 10 class sessions.” Students who rated their effort the highest (5) were separated out from the rest of the experimental group. This separation was to isolate participants who adhered to the experimental treatment by putting forth effort to learn reading or metacognitive strategies. When compared to this subset of experimental group 2, with pre-test scores assigned as a covariate, ANCOVA yielded statistically significant results for the MARSI.

In this adjusted sample, the control group (N = 36) had a mean change score of 0.17, and the adjusted experimental group 2 (N = 23) had a mean change score of 0.67 on the MARSI. Levene’s test of equality of error variances had a significance value of $p = 0.64$, suggesting a homogeneity of variance. In tests of between-subjects effects, $F (1, 56) = 7.98, p = .007$, suggesting a statistically significant difference exists between groups (see table 3). This also strengthens the first hypothesis under the condition that participants adhere to the treatment given.

Table 3 – Change in Metacognitive Awareness for Participants Adhering to Treatment

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td>1</td>
<td>4.369</td>
<td>10.236</td>
<td>.00</td>
<td>.155</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2.544</td>
<td>5.960</td>
<td>.01</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>3.405</td>
<td>7.978</td>
<td>.00</td>
<td>.125</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td>56</td>
<td>.427</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>59</td>
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<tr>
<td>Corrected Total</td>
<td></td>
<td>58</td>
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</tbody>
</table>

Changes in Scripture Study Within Groups

The second hypothesis was tested by comparing increases in metacognitive awareness to changes in released-time seminary students’ attitudes towards scripture study, their scripture study behavior, how they perceive the quality of their study, and how much they enjoy studying the scriptures. Paired-samples t tests were done for the Survey of Student Scripture Study (SSSS). While no change was predicted for the control group (N = 36), overall mean scores increased between testing from M = 3.70 to M = 3.85. This change was statistically significant t (35) = 2.23, p = .03. Significant changes were found in the subcategories of scripture reading behavior and scripture reading enjoyment which accounts for the significance overall (see table 4).

Table 4 – Changes in Scripture Study for Control Group as Measured by the SSSS

<table>
<thead>
<tr>
<th>Control Group – SSSS</th>
<th>Pre-survey</th>
<th>Post-Survey</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Attitude</td>
<td>4.07</td>
<td>0.56</td>
<td>4.23</td>
<td>0.56</td>
</tr>
<tr>
<td>Behavior</td>
<td>3.45</td>
<td>0.67</td>
<td>3.64</td>
<td>0.64</td>
</tr>
<tr>
<td>Quality</td>
<td>3.84</td>
<td>0.48</td>
<td>3.94</td>
<td>0.66</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>3.46</td>
<td>0.74</td>
<td>3.59</td>
<td>0.83</td>
</tr>
<tr>
<td>Overall</td>
<td>3.70</td>
<td>0.55</td>
<td>3.85</td>
<td>0.61</td>
</tr>
</tbody>
</table>

For experimental group 1, the researcher was curious to see if reading strategies influenced metacognitive awareness, and if reading strategies instruction without metacognition was correlated with scripture reading. For this sample (N = 19), the mean change scores for the SSSS overall increased between testing from M = 3.54 to M = 3.72. This change was not significant t(18) = 2.04, p = .06. Each subcategory was similarly evaluated, and significant changes were found in the subcategories of attitude and quality (see table 5).
Table 5 – Changes in Scripture Study for Experimental Group 1 as Measured by the SSSS

<table>
<thead>
<tr>
<th>Experimental Group 1 – SSSS</th>
<th>Pre-survey</th>
<th>Post-Survey</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Attitude</td>
<td>3.92</td>
<td>0.44</td>
<td>4.11</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.28</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>3.25</td>
<td>0.61</td>
<td>3.44</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.85</td>
<td>0.08</td>
</tr>
<tr>
<td>Quality</td>
<td>3.56</td>
<td>0.49</td>
<td>3.82</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.58</td>
<td>0.08</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>3.43</td>
<td>0.55</td>
<td>3.50</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.61</td>
<td>0.22</td>
</tr>
<tr>
<td>Overall</td>
<td>3.54</td>
<td>0.44</td>
<td>3.72</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.04</td>
<td>0.06</td>
</tr>
</tbody>
</table>

For experimental group 2 (N = 81), mean change scores for the SSSS overall increased between testing from M = 3.50 to M = 3.69. This change was statistically significant $t(80) = 5.17$, $p < .001$. Each subcategory on the SSSS also had statistically significant changes. (see table 6).

Table 6 – Changes in Scripture Study for Experimental Group 2 as Measured by the SSSS

<table>
<thead>
<tr>
<th>Experimental Group 2 – SSSS</th>
<th>Pre-survey</th>
<th>Post-Survey</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Attitude</td>
<td>3.94</td>
<td>0.71</td>
<td>4.06</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>3.33</td>
<td>0.78</td>
<td>3.54</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.96</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Quality</td>
<td>3.53</td>
<td>0.72</td>
<td>3.77</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.86</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>3.21</td>
<td>0.88</td>
<td>3.41</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.52</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Overall</td>
<td>3.50</td>
<td>0.71</td>
<td>3.69</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.17</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Changes in Scripture Study Between Groups

To understand if changes in scripture study were correlated to increases in metacognitive awareness, an analysis of covariance (ANCOVA) between groups was also performed for the SSSS. This analysis was conducted to understand if the significant results in experimental group 2’s $t$ test were significant by comparison. Pre-test scores were assigned as a covariate to account
for differences in initial scores. For the SSSS overall score, the control group (N = 36) had a mean change score of 0.15, for experimental group 1 (N = 19) the mean change score was 0.17, and for experimental group 2 (N = 81) the mean change score was 0.19. Levene’s test of equality of error variances had a significance value of $p = .42$, suggesting a homogeneity of variance. In tests of between-subjects effects, $F(2, 132) = 0.06, p = .95$, suggesting that no statistically significant difference exists between groups (see table 7). Similarly, no statistically significant differences were found for any subcategory of the SSSS.

Table 7 – Changes in Scripture Study Comparison Between Groups

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>.689a</td>
<td>3</td>
<td>.230</td>
<td>1.873</td>
<td>.137</td>
<td>.041</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.275</td>
<td>1</td>
<td>1.275</td>
<td>10.393</td>
<td>.002</td>
<td>.073</td>
</tr>
<tr>
<td>SSSS_Overall_Pre</td>
<td>.639</td>
<td>1</td>
<td>.639</td>
<td>5.210</td>
<td>.024</td>
<td>.038</td>
</tr>
<tr>
<td>Group</td>
<td>.014</td>
<td>2</td>
<td>.007</td>
<td>.057</td>
<td>.945</td>
<td>.001</td>
</tr>
<tr>
<td>Error</td>
<td>16.192</td>
<td>132</td>
<td>.123</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21.149</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>16.882</td>
<td>135</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a. R Squared = .041 (Adjusted R Squared = .019)*

For the MARSI, statistically significant effects were found using analysis of covariance when participants adhering to the treatment were isolated. Students rating themselves high for effort on the metacognitive scale were separated and compared to other groups. This same adjusted sample was analyzed regarding the SSSS, but the same effect was not observed. In this adjusted sample, the control group (N = 36) had a mean change score of 0.15, and for experimental group 2 (N = 23) the mean change score was 0.18 on the SSSS. Levene’s test of equality of error variances had a significance value of $p = 0.78$, suggesting a homogeneity of
variance. In tests of between-subjects effects, F (1, 56) = 4.06, p = .32, suggesting a statistically significant difference does not exist between groups.

Effect sizes were also calculated between groups for the SSSS. Small effect sizes were observed between the control group and experimental group 1 (d = .05), the control group and experimental group 2 (d = .11), and between experimental group 1 and experimental group 2 (d = .06). These effect sizes suggest that there was little change in scripture study as measured by the SSSS.

It appears that metacognitive strategies instruction can increase the metacognitive awareness of students, especially the students spending more effort to learn the strategies, supporting the first hypothesis. Increasing metacognitive awareness in this study had no statistical significance and minimal effect on scripture study in terms of attitude, behavior, quality, or enjoyment as measured by the SSSS, thus hypothesis two is not supported.
CHAPTER 5
DISCUSSION

This study investigated the possibility that teaching metacognitive strategies in released-time seminary could increase metacognitive awareness. Findings indicate that metacognitive awareness was increased through metacognitive strategies instruction, as measured by the MARSI. The findings of this study demonstrate that metacognition can be taught and increased in a religious setting in addition to academic settings.

It’s interesting to note that contrary to initial hypotheses, students who were taught metacognitive strategies did not see statistically significant improvement on the MARSI when compared to the students taught general reading strategies. However, a moderate effect size between these two groups demonstrates that there were greater gains in metacognitive awareness for experimental group 2. Schraw and Dennison discovered when writing the Metacognitive Awareness Inventory (MAI), that knowledge of cognition reinforces regulatory control, or the application of metacognition (1994, 446). In other words, knowledge of one’s own cognition helps learners take control of their learning, leading to better performance (1994, 471).

Experimental group 1 did show improvement in the problem-solving strategies subcategory of the MARSI, which measures how readers navigate text when it becomes difficult (Mokhtari and Reichard, 2002, 252). The generalized reading strategies of previewing, writing down summary statements, then reviewing afterwards reinforce knowledge of cognition and regulatory control, even without explicit training in or knowledge of metacognition. Further research is needed on the benefits of metacognitive training verses general reading strategies.

During the intervention it was difficult to get students to work diligently on the metacognitive strategies presented. This may have been caused by the repetition experienced in
class, and lack of student motivation to implement the presented strategies. Unlike other classes attended by participants, there is no scholastic reward or punishment like a grade attached to a grade-point average. Student may therefore take released-time seminary less seriously. Because of these factors, students are sometimes averse to putting forth the effort required to do something like metacognitive scripture study. This led the researcher to separate students by effort, isolating participants who adhered to the treatment.

In a study mentioned previously, researchers would wait until after students had taken their first test to introduce metacognitive strategies, and then the students who had performed poorly were motivated to learn the strategies (Cook, Kennedy, McGuire 2013, 962). When conducting his research, Rackley was interviewing one student at a time on a single occasion, with the think-aloud exercise as a by-product of his observational research (Rackley 2015, 133). In this case, participants either complied with the researchers request or did not participate in the research. In the case of this study, even though students were presented with metacognitive strategies they were free to disregard the instructions or give minimal effort in their attempts. Isolating students who put in greater effort may be a benefit for future research in the field of metacognition. In other studies where metacognition is taught to entire classes, students with lackluster participation may be skewing the data collected.

It was hypothesized that increasing metacognitive awareness would be correlated with changes in scripture study. Considering the benefits that come from metacognition, it was surprising that results on the SSSS for experimental group 2 weren’t significantly different from the control group or experimental group 1. This may be due to several factors.

First, lack of significant results may be due to the limited time that students were exposed to metacognitive strategies, and the global nature of this investigation. Many studies that
investigate the effect of isolated metacognitive strategy can simply train or instruct participants in that strategy and test for results in one session (see Redford et. al., 2012, 264; Thiede and Anderson, 2003, 136-7). This allows researchers to see a short-term effect of one metacognitive strategy on a dependent variable like test scores on reading comprehension tests. Many studies that investigate the effect of metacognition generally and over time usually spend four weeks or more, but in academic classes where additional training also occurs (Berkeley and others 2011, 23; Dabarera and others 2015, 464; Sporer, Brunstein, and Kieschke 2009, 276; Habibian, 2015, 64). Drs. Cook, Kennedy, and McGuire found that test scores improved for chemistry students with less than an hour of metacognitive instruction, but students applied this knowledge over the course of an entire semester (2013, 961-962). A more long-term intervention may have led to more conclusive results.

While experimental group 2 did not show significant gains (as a group) over the control condition, their post-survey scores might suggest that, given more time, they would have significant improvements. This could be an area for further inquiry in the future. How could metacognitive strategies instruction over the course of an entire term or semester affect the metacognitive awareness and quality of scripture study in released-time programs?

There may have also been other factors such as students’ preconception about themselves as scripture readers. More time may have been necessary for a student’s attitudes or behaviors to change about a personal activity like scripture study. There could also have been a disconnect between what students were learning in class, and the effort they gave to their scripture study at home. The SSSS may have also used a scale that did not sufficiently represent nuances of good scripture study. The SSSS is not a standardized testing instrument. This introduces a potential threat to internal validity.
Participant Reflections

One of the teachers who participated in the study spent some time debriefing his students at the end of the year. He asked them questions about what they had learned over the course of the semester, what had made a difference in their lives, etc. Several students mentioned how valuable the metacognitive strategies had been. They expressed that when applying metacognitive strategies, they got much more out of their study. Many of the other students agreed. This teacher said that every student who talked about metacognition mentioned the work necessary to apply the strategies and that their own laziness sometimes stopped them from putting in any effort. The students did conclude that the work was worth it because of the difference metacognition made in their scripture reading (Deray Young, personal conversation with researcher, May 31, 2018).

While questioning students about metacognitive strategies, many students mentioned that it really helped them think about what they were learning. All the teachers helping conduct research noticed that after students were given time to do a metacognitive activity, there was much more participation from students - discussions were longer and higher quality, answers were more thoughtful and thought out, and students were anxious to share what they had discovered. This same increase in participation occurred in research by Stewart, Rasmussen, and Okey in social studies classrooms (2015, 77-84). A quantitative design with metacognitive strategies as an independent variable, and the number of comments made by students as a dependent variable, could be an interesting avenue for further research in released-time seminary programs of the Church of Jesus Christ of Latter-day Saints. Researchers could count the
number of comments made in a class after metacognitive instruction and compare it to classes who received standard instruction by the same teacher, for the same lesson.

Students in the reading strategies group (experimental group 1) really seemed to enjoy the reading strategies that were presented, and quickly grew anxious to learn more. The students who worked only on reading strategies had great success in using the same strategy for multiple class sessions. This gave them practice with the basic framework of previewing a text, writing down summaries, and reviewing. Students in this group seemed resistant at first to the extra work that was required in stopping every two verses to write something down, but then really grew excited after the activity was over because of what they learned. Researchers also observed that once these students were working on a passage they seemed totally engaged for the duration of the activity.

Students in experimental group 2 seemed to lose interest in the metacognitive worksheets over time. This suggests that metacognition integrated as part of routine lesson instruction, without standardized formatting, could keep the students’ attention and interest longer. The skills of preview, download, and review could be encouraged separately, and with other approaches to metacognition mixed in to routine classroom instruction.

Researcher’s Recommendations

Although the results of this study were not as conclusive as had been hoped, many valuable lessons were learned that can be applied to released-time seminary classrooms. It is likely that the formal and standardized approach of this intervention may have decreased many students’ motivation to try metacognitive strategies. Going forward there could be value in utilizing short metacognitive activities during a lesson. These activities could be introduced without formal instruction or background in metacognition. It seemed clear to the researcher that
students engaged in metacognitive strategies were having a more positive classroom experience. It may be that a focus on motivating students to use metacognitive strategies, instead of focusing on the strategies themselves, would lead to higher participation among students. Released-time seminary teachers always try to motivate their students to learn through stories and activities, but learning activities with metacognitive components that motivate students can and will increase learning in the classroom.

**Limitations and Further Research**

The vision of this study was to see if metacognition could impact scripture study by making small adjustments in how a teacher helps students approach the scriptures. Could metacognition help students learn how to monitor their own learning, adjust their strategies to meet the demands of the text, help them to enjoy reading the scriptures, and feel a growing sense of competency with a difficult text? It’s a difficult task to teach reading strategies to groups of individuals. Individual instruction would be more effective but impractical in released-time seminary programs.

Another constraint was time available in class. Released-time seminary curriculum currently utilizes it’s time spent teaching students the content of the scriptures, but very little on how to read the scriptures. Because of this design, students come to class with the expectation of being taught, instead of learning for themselves. This is a barrier to motivation, as reflected in the data. Future interventions could introduce metacognitive concepts more slowly. If this study were to be replicated, metacognitive strategies could be taught after three or four class periods practicing with the standard reading strategies. Once students saw the value of writing a few things down and taking time to think about what they were reading, it may be more natural to introduce metacognition as a next step in scripture study strategies.
Similar studies should be conducted to further investigate the impact of metacognition in religious education and personal scripture study. Qualitative data may be valuable. A small focus group of diverse students, taught metacognitive strategies and given individual assignments, might yield more descriptive results. Students could learn metacognitive strategies, try them at home, report on their individual effort, and discuss which strategies are working well and which are not. This would help researchers identify where students benefit most from metacognitive strategies, and which specific strategies could be implemented in a classroom in the most effective way. Researchers could also study the relationship between metacognition and classroom participation, as metacognition appeared to increase participation during this study. The addition of metacognitive strategies in religious education is a promising way to teach released-time seminary students “how to fish,” and warrants further research.
REFERENCES


Bednar, David A. “Because We Have Them Before Our Eyes.” New Era, April, 2006.


Kettmann-Klingner, Janette, and Sharon Vaughn. “Promoting Reading Comprehension, Content Learning, and English Acquisition through Collaborative Strategic Reading (CSR).” *The Reading Teacher* 52, no. 7 (April 1999): 738-47.


The following metacognitive curriculum was developed by the researcher and given to teachers participating in this study. It begins with an explanation of each of the groups in the study and what they will be taught. It is written in future-tense because it was presented to the teachers prior to intervention. It also includes each handout given to participants.

Metacognitive Curriculum

The Control group will not be given any special instruction. Class will be conducted as usual without any variation.

Experimental Group 1

This group will be given a handout and instructed in before, during, and after reading strategies without any metacognitive components (see figure 1). Teachers will model these for the students and have them practice each component individually. Teachers will do this for two class sessions, then invite students to follow the handout on their own. Teachers will provide students with 10-15 minutes each class period to use these scripture study strategies on a teacher-selected passage for the duration of the study. No other modifications will take place.
Experimental Group 2

To introduce and illustrate the concept of metacognition, participants will be given an exercise that demonstrates the power of metacognitive processing (McGuire and McGuire 2015, 20-25). The exercise instructs students to “count the vowels” in a list of words that they are about to see (see figure 2). They will have 45 seconds to count the vowels. There are fifteen words in the list, and the list consists of nouns arranged in a specific pattern. After counting the vowels, the list of words is taken away and the students are instructed to reproduce as many of the words from the list as they can remember. The results are usually very dismal because the students are focused on counting vowels instead of memorizing the list. The list is then shown again, and the students are told that there is a pattern to the list. The first word is “dollar bill,” the second “dice,” and the third “tricycle.” Each word corresponds to its number on the list.
Once students identify the pattern, they are given 45 seconds to memorize the list. After 45 seconds they are asked to reproduce the list, and the results are usually very good.

Figure 2

<table>
<thead>
<tr>
<th>Count the vowels!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar Bill</td>
</tr>
<tr>
<td>Dice</td>
</tr>
<tr>
<td>Tricycle</td>
</tr>
<tr>
<td>Four-leaf clover</td>
</tr>
<tr>
<td>Hand</td>
</tr>
<tr>
<td>Six-pack</td>
</tr>
<tr>
<td>Seven-up</td>
</tr>
<tr>
<td>Octopus</td>
</tr>
<tr>
<td>Cat lives</td>
</tr>
<tr>
<td>Bowling pins</td>
</tr>
<tr>
<td>Football team</td>
</tr>
<tr>
<td>Dozen eggs</td>
</tr>
<tr>
<td>Unlucky Friday</td>
</tr>
<tr>
<td>Valentine’s Day</td>
</tr>
<tr>
<td>Quarter hour</td>
</tr>
</tbody>
</table>

The point guard on a basketball team (a reader) is determined to score points (comprehension). Through practice a point guard has developed a variety of skills and his team has practiced several plays (reading comprehension strategies). In the middle of a fast-paced game, however, the point guard will need to know what plays are appropriate at the right time, how effective those plays are against their opponent, how well his or her teammates are performing, how well their own skills match up against the opposing team, and how, where, and when to adapt their strategies if they aren’t working (metacognition). This in-game monitoring and regulation of skills and plays is the same thing that competent readers must develop to navigate difficult texts. If a point guard thinks, “Boy, the last three times we’ve run that play, the
other team has stopped our forward from scoring. We better run some different plays until that defender isn’t suspecting this one again,” they are monitoring the effectiveness of their strategy and regulating their approach. This is metacognition at work.

After sufficient explanation, students will be asked to verbalize a definition of metacognition to a partner, and then their partner will be asked to repeat back a definition of metacognition using different words. This is a metacognitive check on their understanding of metacognition. If they can’t teach a partner what metacognition is, they haven’t really understood the definition.

Students will then be introduced to how metacognition is beneficial in many different aspects of their lives. The following statistics and feedback from Dr. McGuire’s chemistry classes will be shown to the students using a PowerPoint presentation (McGuire and McGuire 2015, 181).

- Travis, junior psychology student: 47, 52, 82, 86 - B in course
- Joshua, first year chemistry student: 68, 50, 50, 87, 87, 97, 90 (final) - A in course
- Dana, first year physics student: 80, 54, 91, 97, 90 (final) - A in course
- From an engineering class at New Mexico: Students who did not use metacognition averaged 58 and 54 on the first two exams respectively, while students who used metacognitive strategies averaged 95 and 80 on the first two exams.

The following points will also be presented and discussed:8

- Metacognition has been found to be a strong predictor of academic success (Hattie, 2009).
- People differ in how well and how quickly they learn in part because of differences in metacognitive skills (Pellegrino and Hilton 2012, 35).
- One study found that metacognition was the number one shared characteristic of high academic achievers (Wang, Haertel, and Walberg 1993, 249).

8 Some of these main points were made in Wilson and Conyers 2016, Teaching Students to Drive Their Brains, 12-17.
• Another study identified 150 factors that influence student achievement, with metacognitive strategies ranked 15th (Hattie, 2012).
• Everyone can benefit from learning metacognitive reading strategies. One study demonstrated marked improvements in performance for students with learning and other mild disabilities who learned metacognitive skills (Berkeley, Mastropieri, and Scruggs 2011, 27-30) and that metacognition can be learned regardless of IQ (Schraw 1998, 116).
• Metacognition increases reading comprehension (Spörer, Brunstein, and Kieschke 2009, 284).
• Metacognition makes reading more enjoyable (Zhao and others 2014, 48-55).

This information is exciting, compelling, and can be readily applied to scripture study. Because of their language and difficulty, the scriptures are much more like an academic textbook than a novel. One of the major goals in reading scripture is to ponder its message. LDS youth are taught to “search, ponder, and pray,” from the time they are in primary, but little training in pondering is ever given. Metacognition can form the foundation for students to develop this ability. To “think about thinking,” will not only help students better understand or comprehend the scriptures, but to analyze, discover, apply, and receive revelation – to ponder. The LDS Guide to the Scriptures states that pondering is “to meditate and think deeply, often upon the scriptures or other things of God. When combined with prayer, pondering the things of God may bring revelation and understanding” (“Ponder”; scriptures.lds.org). It is by pondering that Nephi is “caught away” into the vision of the tree of life (1 Ne 11:1). Joseph Smith (D&C 76) and Joseph F. Smith (D&C 138) both had similar experiences with pondering leading to revelation. Elder Richard G. Scott has stated that “pondering a passage of scripture can be a key to unlock revelation and the guidance and inspiration of the Holy Ghost” (“The Power of Scripture,” Ensign or Liahona, Nov. 2011 6.). Once students understand the impact that metacognition can have on their scripture study, practical teaching can follow.
Researchers have determined that metacognition is effective when applied before, during, and after a reading task (Isakson and Isakson, 2017). The experimental groups will be instructed in simple strategies, one at a time, in a logical progression to train them to be more metacognitive in their approach to the scriptures. Teaching students to be more metacognitive can be accomplished by asking questions that elicit a metacognitive response and by teaching strategies that increase metacognition while reading at each stage – before, during, and after.

Metacognition Before Reading - Preview

To introduce the importance of metacognition before reading, the following paragraph will be presented to students:

The procedure is actually quite simple. First you arrange items into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step; otherwise, you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important, but complications can easily arise. A mistake can be expensive as well. At first, the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but, then, one can never tell. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more, and the whole cycle will then have to be repeated. However, that is a part of life (Bransford 1979, 134-135).

Students will be asked to read this paragraph and then answer the questions, “Why might complications arise from trying to do too many?” and “Why does the cycle have to be repeated?” These questions are unanswerable from the text, because the topic of the text is unknown. Then the heading, “Laundry” will be placed at the top of the paragraph. Students will be asked to read the paragraph again to see if their understanding increases and if they are able to answer the questions previously asked. This exercise illustrates the concept that having some prior
knowledge about a reading passage can increase understanding of the text. Having prior knowledge of a passage’s topic, however, is not metacognitive, in and of itself. Metacognition occurs when students consider what they already know about a given topic, predict what they think they might learn in a passage based on textual clues, and create a purpose in reading a particular text. These activities are metacognitive because they elicit monitoring and regulating.

Like a movie trailer excites potential patrons about an upcoming film, previewing a text can help readers generate excitement about a text. For the strategy “Preview,” students will be taught to survey a scriptural text prior to reading. Students will preview a chapter of scripture by reading carefully the chapter heading, scanning the length of the chapter, reading the first and last verse to check for topic and concluding sentences, sampling the text by reading several random verses, and scanning the footnotes to see if there are any clues. Previewing in this way is not inherently metacognitive, which is why this cognitive reading strategy will be introduced to both the control and experimental groups, but the experimental group will receive additional metacognitive prompts after a few days. The handouts that are prepared will walk both teachers and students through a metacognitive preview in several different ways. To illustrate the difference between a cognitive strategy and a metacognitive one, in the metacognitive strategy a teacher can ask students to predict what they think they will learn in this chapter. If a student cannot predict what they might learn, they will be able to recognize the breakdown in their previewing and go back to the textual clues for answers. This is monitoring and regulating. If a student can predict what they think they should learn, they can also consider what they already know about that given topic, and generate questions that they believe the text might be able to answer. Students can then compare what they know about the topic to what they learn as they read. This can prompt them to consider what information surprised them, was different than they
previously thought, or confirmed what they suspected as they read. If a student asks an appropriate question that they believe might be answered by the text, they will be consistently monitoring their thought processes to see if they are encountering answers, and they will be motivated to regulate their learning to make sure they aren’t missing any possible answers. Effectively previewing a text also prepares students to analyze their learning at the end of reading (a regulatory task) to determine the effectiveness of their strategies. All of these activities create a purpose for reading, beyond the purpose of simply “reading the text.”

Sample questions that elicit a metacognitive response prior to reading include the following:

- What information surprised me in my preview?
- What did I think about while I was previewing? Was I thinking about the right things?
- What information did I find confusing?
- Can I ask any questions for clarification?
- What do I expect to learn as I read? Can I predict what is coming?
- What information would I expect to read that could apply to my life? Or to teenagers?
- Why do I want to read this passage?
- Can I come up with a question I think the text could answer?
- What do I want to accomplish as I read?
- Are there different ways I could read to get the information I want?
- What strategies would work best?
- What do I already know about this topic?
- What resources might I need to understand this passage?
- What should I do next? What’s my plan?
- How can I motivate myself to do the task to the best of my ability?

The natural conclusion of learning the “preview” strategy is to move to strategies that can be used during reading.

*Metacognition During Reading - Download*

Our brains possess a limited amount of working memory. We can only hold so much at a time without saving files to a more secure location. Students in both the experimental and
control groups will be introduced to the practice of taking notes every few verses while reading scripture, and what to do if they feel they are not understanding the text. Cognitive strategies that students can use when they don’t understand a text are often referred to as “fix-up” strategies. Students will be given a checklist of strategies that they can employ when they feel they don’t understand. The checklist includes:

- Rereading a difficult passage
- Reading on and coming back to confusing passages
- Looking in preceding/succeeding verses for textual clues
- Break down a text into different parts
- Looking up word definitions
- Asking a classmate for clarification
- Consulting the Bible Dictionary or Guide to the Scriptures
- Consulting an Institute or Seminary manual for information
- Asking the teacher for clarification

Taking notes and employing fix-up strategies are good cognitive skills, but they are not inherently metacognitive. Metacognition happens when students begin recording what they are thinking while they are thinking it, increasing their capacity to monitor and regulate their learning. Writing down what you are thinking, or writing down why you think something is important, or how you could apply or relate the material to your life, turns this cognitive strategy into a metacognitive one. Readers do not have to write down what they are thinking to make reading metacognitive, but writing down thoughts as they come can train readers to do this naturally. A good metacognitive reader stops frequently to ask themselves if what they have read makes sense, and if they understand. Taking notes on thoughts can facilitate this process. Students in the experimental group will use the handouts provided to approach a text metacognitively.
Students will be taught that their brains can probably hold between one and three verses, depending on how capable they feel as a reader and the difficulty of the text. They will also be taught that readers tend to over-estimate how well we understand a given text, implying that readers generally understand less than they think. Students will then be taught to read a verse and write down two things – what they are learning, and what they are thinking while reading. Having students do both things prevents them from simply writing down a few key words from a verse and then moving on without processing what they are reading. For example, if a student is thinking about something unrelated to the task of reading, they can redirect to the text. A student could write, “I’m thinking that I don’t understand what I just read. Maybe I should go back and check for clues about this verse.” When a reader has to write down what they are thinking it creates an awareness of their own learning process. If there isn’t a lot of cognition happening while they are reading, they become aware that they really aren’t learning much at all. Many students have an illusion of understanding, a belief that they are learning because they have read each word on a page. Stopping to think about their thinking, connecting different ideas, or condensing content into relative parts forces readers to understand (monitor) their own thought processes, decide if their strategies are effective (regulate), and choose strategies that can increase their understanding when comprehension is low (regulate). Once students have learned to differentiate between what they are learning and what they are thinking while reading, they can focus on one or the other as their monitoring and regulating dictate.

There are several ways to expand the “download” section of reading. Once students have learned to download verse by verse, they can begin to download several verses at once, condensing main ideas into short summary statements, both of content and thought. Students can also start by downloading one verse, but then each succeeding download must connect to the
previous download, creating a chain, web, or diagram representing relationships in meaning and thought. Creating a concept map, or thought map, is one way to accomplish this. Instead of writing down summaries or creating a concept map, students can also stop periodically and visualize what they are reading. Students can also verbally restate verses they are reading in their own words, inserting their own commentary along the way.

Students will also be asked to pause for a short metacognitive evaluation while they are reading. Questions like the following will be used to ensure a metacognitive approach to a reading task:

- Am I doing things that will help me understand what I’m reading?
- While reading, do I need to change my initial assumptions about the text?
- Am I trying to go too fast? Am I going too slowly? Am I focused on my reading goals?
- Do I remember my purpose for reading this passage?
- Am I continuing to think about other connections or applications while I am reading?
- Do I stop occasionally to make sure I really understand what I am learning?
- Do I ask myself if this is making sense?
- Do I understand what I just read? If not, should I read faster, slower, or reread?
- Do I ask myself how well I am doing at learning the new information?
- How good am I at judging how well I understand this?

These questions, paired with the students’ practice of downloading, will help them monitor and regulate their progress in reading comprehension be metacognitive about their learning.

Metacognition After Reading - Review

After students are done reading, it’s important for them to “review” what they have learned. Both the experimental groups will be asked to write short summary statements of what they have learned, a good cognitive review strategy. The experimental group will also be taught metacognitive review strategies that can be very simple and applied in a variety of ways. The most important aspect of a metacognitive review is to have students evaluate not what they’ve
learned, but *how* they learned. Even simple questions can elicit a metacognitive review. The handouts provided to students will help elicit an appropriately metacognitive response. The following are examples of questions that elicit a metacognitive review:

- Did I learn what I set out to learn in the beginning?
- How effective were my reading strategies?"?
- How well do you think you would do on a reading comprehension test of this material and why?
- What could I do in the future to improve my reading comprehension on a passage like this? Would I do the same thing, or would I do something different?
- How well do I think I understood the reading?
- Did you learn what you expected, or did you learn something different?
- What could I do different next time I read to be more effective?
- What did I do well this time that I should continue to do in the future?
- Did I review to myself the main things I learned?
- Did I ask myself if I learned as much as I could?
- Did I answer any questions I had before reading the text?
- Did I accomplish my purpose in reading this passage?
- Did I stay on task while I was reading, or did my mind wander? If my mind wandered, what did I do to get myself back on task?
- What did I do to focus my mind while reading? Was it effective?
- What strategies did I use while reading today? Did I choose the most effective ones?

To assess their own learning, students can try to reteach what they have learned to a classmate or write a short abstract on the material they have studied. Both of these activities need to be done without a student consulting their notes. If a student is unable to summarize the material they have learned verbally or in writing they become aware that only superficial learning has taken place. If this is the case, a student can return to their notes and the text in preparation to summarize their material. Keith Thiede and Mary Anderson also demonstrated in one study that introducing a short delay in between studying material and summarizing its content can increase metacomprehension accuracy (Thiede and Anderson, 2003).
Daily Breakdown of Metacognitive Instruction

The following information is a breakdown of the daily instruction teachers were to give to students. The researcher communicated with each teacher daily about what was taught, and what was to be taught on the following day.

Control Group

The control group will be given no special instruction.

Experimental Group 1

Experimental group 1 will be introduced only to the cognitive strategies of preview, download and “fix-up” strategies, and summarizing. These techniques will be modeled by the teacher and practiced by students for the duration of the intervention.

Experimental Group 2

On day 1, experimental group 2 will be introduced to metacognition and practice separately before, during, and after reading cognitive strategies. Students will practice these techniques for a total of two class periods using the handout previously mentioned. After two class sessions teachers will add a metacognitive component. Six unique handouts will guide both students and teachers through a metacognitive study of the scriptures. Each handout will be used in succession, one through six, and then repeated an additional time. Each handout is constructed to be used individually, and to build on the before, during, and after cognitive strategies initially introduced. Teachers will need to model the metacognitive instructions of the “during” portion on the first two handouts. The following handouts are numbered in the order teachers will present them to students:
A. Scripture Study Strategies

Before diving in:
- Read the chapter heading to identify the chapter's main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

While Reading:
- Stop every 1-3 verses and write down or explain out loud what you are learning

To Evaluate:
- Try one of the following:
  - Mentally summarize what you have learned
  - Write short summary of what you learned on paper
  - Explain what you have learned to someone else

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1. Metacognition
Thinking about Thinking
“...And I was caught up in the Spirit...” 1 Cor 12:1

Before diving in:
- Read the chapter heading to identify the chapter's main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive Instructions:
- Respond to at least one of the following questions:
  - What information surprised you in your preview?
  - What did you think about while you were previewing?

When I Don’t Understand:
- Reread a difficult passage
- Take notes every couple of verses
- Look up the verses before and after for clues
- Look up definitions of difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classroom or teacher for help/clarification

Metacognitive Instructions
- Quickly review your notes: Cover your notes, close your scriptures, and see if you can explain what you learned and think about it to another person.

Ask yourself:
- How easy was it to explain what I learned to someone else? Why or why not?
- What did I do while I was reading that helped me prepare to explain what I learned to someone else?
2.

**Metacognition**

**Thinking about Thinking**

“As I sat pondering in mine heart I was caught away...” I No. 11:1

**Before diving in:**
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

**Metacognitive instructions:**
Respond to at least one of the following questions:
- What information surprised you in your preview?
- What did you think about while you were previewing?
- Do you know what this chapter is about to teach? How did you come up with that answer?

**When I Don’t Understand:**
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classroom or teacher for help/clarification

**Metacognitive instructions**
While you are reading, stop every two verses and write down what you are learning and thinking — use summary statements that capture main ideas and thoughts

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3.

**Metacognition**

**Thinking about Thinking**

“As I sat pondering in mine heart I was caught away...” I No. 11:1

**Before diving in:**
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

**Metacognitive instructions:**
Respond to at least one of the following questions:
- What information surprised you in your preview?
- What did you think about while you were previewing?
- Do you know what this chapter is about to teach? How did you come up with that answer?

**When I Don’t Understand:**
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classroom or teacher for help/clarification

**Metacognitive instructions**
To Evaluate, ask yourself the following questions:
- How did thinking out loud help me learn from this passage? Did it help me learn?
- What did I notice about my thoughts because I was speaking them out loud? Did my mind wander, or was I able to stay focused?

**Metacognitive instructions**
While you are reading, stop every two verses and explain what you are thinking to a partner. Don’t change anything you would normally do; just think out loud. Feel free to do anything you need to in order to understand the passage.
4. Metacognition
Thinking about Thinking
“As I sat pondering in mine heart I was caught away...” 1 No. 11:1

Before diving in:
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive Instructions
- Based on your preview, write down something you want to learn while reading.

When I Don’t Understand:
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Look up terms in the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classmate or teacher for help/clarification

Metacognitive Instructions
- Do I remember what I wanted to learn from this chapter? Should I change what I want to learn?
- What is most interesting to me so far?

5. Metacognition
Thinking about Thinking
“As I sat pondering in mine heart I was caught away...” 1 No. 11:1

Before diving in:
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive Instructions
- Why do you want to read this chapter? What are you curious about? Write down your answers.

When I Don’t Understand:
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Look up terms in the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classmate or teacher for help/clarification

Metacognitive Instructions
- Do I remember the reason that I am reading this chapter? Should my purpose change at all?
- Am I still curious about what I am reading?
- What is most interesting to me so far?
6.

**Metacognition**
Thinking about Thinking

"As I sat pondering in mine heart I was caught away..." I 11:1

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**Before diving in:**
- Read the chapter heading to identify the chapter's main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

**Metacognitive instructions:**
- Take 30 seconds and make a list of some of the things you already know about the topics you are going to study.

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**When I Don't Understand:**
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classmate or teacher for help/clarification

**Metacognitive instructions**
While you are reading, stop and ask yourself the following questions:
- Have I learned anything new while I am reading? (Add it to your list)
- Did I stop occasionally to make sure I really understand what I am reading?

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**Before diving in:**
- Read the chapter heading to identify the chapter's main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

**Metacognitive instructions:**
- What do you expect to learn from this chapter? Write down a short answer.

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**When I Don't Understand:**
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classmate or teacher for help/clarification

**Metacognitive instructions**
While you are reading, stop and ask yourself the following questions:
- Am I learning what I expected to learn from my previous What Information confirmed my expectations? What Information did not?
- Am I trying to read too fast? How's my pace?
8.

Metacognition
Thinking about Thinking
“As I sat pondering in mine heart I was caught away…” 1 No. 11:1

Before diving in:
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive Instructions:
- Based on your preview, write down something you expect to learn while reading.

When I Don’t Understand:
- Reread a difficult passage
- Take notes on every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classroom teacher or function

Metacognitive Instructions
While you are reading, stop and ask yourself the following questions:
- Did I look for answers to the question(s) I asked?
- Have I found the answer(s) I was looking for?
- Should I change my question(s) based on what I have read so far?
- Do I have any new questions?

9.

Metacognition
Thinking about Thinking
“As I sat pondering in mine heart I was caught away…” 1 No. 11:1

Before diving in:
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive Instructions:
- Based on your preview, write down something you expect to learn while reading.

When I Don’t Understand:
- Reread a difficult passage
- Take notes on every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classroom teacher or function

Metacognitive Instructions
While you are reading, stop and ask yourself the following questions:
- Did I look for answers to the question(s) I asked?
- Have I found the answer(s) I was looking for?
- Should I change my question(s) based on what I have read so far?
- Do I have any new questions?
10. Metacognition
Thinking about Thinking
“As I sat pondering in mine heart I was caught away…” I No. 11:1

Before diving in:
- Read the chapter heading to identify the chapter’s main topics
- How long is the chapter?
- Read the first and last verse
- Read two or three random verses scattered throughout the chapter
- Scan the footnotes and look for anything that stands out

Metacognitive instructions:
- After previewing (but before you read in detail), write down why you think this chapter could be important for you or other teenagers to understand.

When I Don’t Understand:
- Reread a difficult passage
- Take notes every couple of verses
- Look in the verses before and after for clues
- Look up definitions for difficult words
- Check footnotes, the Bible Dictionary, Guide to the Scriptures, or a Seminary or Institute Manual for more information
- Restate verses in your own words
- Visualize (imagine) what you are reading
- Ask a classmate or teacher for help/clarification

Metacognitive instructions
To evaluate, ask yourself the following questions:
- Do you still agree with what you wrote before reading this passage? Why or why not?
- How much effort did I put into understanding this passage?
- How well did my reading strategies work? Should I do the same thing next time? Should I do something different?
Recruitment Script

Dear students,

I would like to invite you to participate in an experimental study to see if there are any benefits to practicing metacognition while reading the scriptures. Metacognition is a fancy word that means “thinking about thinking.” Metacognition isn’t about what you learn, it is the ability to recognize if you are learning or not, and the ability to understand how you learn and then adapt as needed. For example, when you are reading, do you know whether you are understanding every word? Do you know what to do when you don’t understand what you are reading? I believe that learning to be more metacognitive can help students enjoy, ponder, and seriously study the scriptures.

If you decide to be in the study, we will ask you to try out some metacognitive reading strategies during class. As a class we will practice metacognitive strategies for 10-15 minutes every class session for 10 classes. These activities will be part of the normal lessons we usually have, and you won’t be missing out on content from the scriptures. The techniques that you will be taught in this study are easy to apply. Each activity will have specific instructions that you follow as you read. There is also no reading requirement, meaning it doesn’t matter how much you read during these activities. You can go at your own pace. Studies have shown that everyone can benefit from metacognition. Students with learning disabilities or difficulty reading can make significant improvements by learning metacognition.

Before we start doing any metacognitive strategies, you will be asked to take two surveys. One survey asks what you know about metacognition, and the other survey asks you about how you feel towards reading the scriptures, how often you read them, and the quality of your scripture study. You will take these same surveys after the 10 classes of metacognition are over. It should take about 20 minutes to take both surveys, and I will do everything I can to keep your answers anonymous. You will not put your name on the survey, just a number or nickname to represent who you are.

There are no direct benefits for taking part in this study. The purpose of this study is to see if metacognition can be helpful when applied to scripture study. It is the first study of its kind in seminary, so we have no idea if it will help. There will be no impact on your grade or credit in seminary if you choose to participate, or if you choose not to participate. The study techniques could be frustrating to you, and it is possible that I will be able to figure out the results of your survey questions, but I will do everything possible to make this a positive experience and keep your answers private. If you decide not to participate during the study, you can drop out at any time.

Thank you for your consideration,

Trevor Pearce  
BYU – M.A. Religious Education
Permission Forms

Parental Permission for a Minor

Introduction
My name is Trevor Pearce. I am a graduate student from Brigham Young University. I am conducting a research study about metacognition. Metacognition, sometimes defined as “thinking about thinking,” is the ability to monitor and regulate learning. Individuals who work to develop this ability become more self-sufficient learners. Research has shown that individuals of all abilities can benefit from learning a metacognitive approach to learning. I am hopeful that applying metacognitive strategies to scripture study can create positive experiences reading and pondering the Word of God. I am inviting your child to take part in the research because he or she attends the Kaysville Seminary where this research is being conducted.

Procedures
This study will take place as part of your child’s normal class routine. Metacognitive strategies instruction will be added to regular instruction for 10-15 minutes every day for 10 consecutive class periods. Your child will be invited to study a passage of scripture from their lesson that day for 10 minutes using a guided metacognitive worksheet. Your child will be encouraged to read at their own pace and analyze their own thought processes. There will be no quiz on the material they study or any reading comprehension measurements. There is no way to fail at using metacognitive strategies because they are only aimed at helping your child think about their own thinking, or to ponder, and there is no wrong way to ponder scripture.

Two surveys will be administered before and after the intervention begins. One survey asks what your child knows about metacognition, and the other survey asks your child about how they feel about reading the scriptures, how often they read them, and the quality of their scripture study. These surveys will be given together on the first and last days of my study and should take about 20 minutes to complete. These surveys are designed with simple questions to see if there is any measurable effect on metacognitive awareness, scripture study habits, and attitudes towards reading scripture.

Example questions:
The last time you read the scriptures, how long did you read?
I read the scriptures even when no one asks me to (agree or disagree)
I have a purpose in mind when I read scripture (agree or disagree)

Risks
Risks in this study will be minimal. Your child may experience some frustration with a new learning strategy, or feel embarrassed when answering questions about their personal scripture study. Your child only needs to answer questions that they feel comfortable answering, and your child may stop the entire process at any time without affecting his/her standing or grades in class.
There is a risk of loss of confidentiality, which the researcher will reduce by not using any real names or other identifiers in the written report. All data gathered will be anonymous, your child’s responses tied to a number, not their name. The researcher will also keep all data in a locked file cabinet in a secure location. Only the researcher will have access to the data. According to standards set in research, data will be confidentially stored for three years.

**Confidentiality**
From the moment data is gathered it will not be tied to any individual participant. None of the data could be traced backwards to an individual student. The only identifying information collected will be age, grade, and gender, for statistical purposes. All electronic data will be kept in password-protected files accessible only by the researcher. All physical data will be kept in a locked file cabinet, in a locked office.

**Benefits**
There are no direct benefits for taking part in this study. Your child may find more meaningful ways to read and ponder the scriptures, but that benefit is not guaranteed. Metacognition has been shown to help students of all skill levels improve their ability to learn, including students with learning disabilities. The purpose of this study is to see if metacognition can be helpful when applied to scripture study. This study might also give other teachers ideas about how to help seminary students get the most out of their scripture study.

**Compensation**
There will be no compensation for participation in this study.

**Questions about the Research**
Please direct any further questions about the study to Trevor Pearce at 801-543-2950, or pearcets@ldschurch.org. You may also contact Dr. Daniel Judd at 801-422-3290, or dkj4@byu.edu.

Questions about your child's rights as a study participant or to submit comment or complaints about the study should be directed to the IRB Administrator, Brigham Young University, A-285 ASB, Provo, UT 84602. Call (801) 422-1461 or send emails to irb@byu.edu.

You have been given a copy of this consent form to keep.

**Participation**
Participation in this research study is voluntary. You are free to decline to have your child participate in this research study. You may withdraw your child's participation at any point without affecting your child’s grade/standing in seminary whatsoever.

Child's Name:

Parent Name: Signature: Date:
Youth Assent (15-17 years old)

**What is this study about?**

My name is Trevor Pearce. I am from Brigham Young University. I would like to invite you to take part in a research study. Your parent(s) know we are talking with you about the study. This form will tell you about the study to help you decide whether or not you want to be in it.

In this study, we want to learn about Metacognition – a fancy word for how people think, and if a person knows how they themselves think.

Examples: When I’m reading, do I know if I understand every word? Do I know what to do when I don’t understand what I’m reading? Do you know what kinds of reading strategies you can use to help you understand the scriptures better?

**What am I being asked to do?**

If you decide to be in the study, we will ask you try out some metacognitive reading strategies during class. Your teacher will give you a half-hour overview of metacognition, then explain and demonstrate how these strategies work. You will also be given a step-by-step guide to help you do each metacognitive strategy. These activities will help you study some of the scriptures that your teacher is going to be covering in class that day. These metacognitive reading strategies will take between 10 and 15 minutes to complete, and it doesn’t matter how much you read in that time. You will do one of these metacognitive strategies in class for 10 class periods in a row. The good thing about metacognitive strategies is that you can’t do them wrong! There are no test questions, no evaluation of your reading comprehension, and no specific amount that you must read. Metacognition is about what you think, and what you think is entirely up to you - there are no wrong answers. Metacognition is like pondering, and there is no wrong way to ponder scripture.

Before and after learning these strategies, we will also ask you to take two surveys. These surveys will be given together on the first and last days of the study and should take about 20 minutes to complete. One survey asks what you know about metacognition, and the other survey asks you about how you feel towards reading the scriptures, how often you read them, and the quality of your scripture study. These surveys are designed with simple questions to see if there is any measurable effect on metacognitive awareness, scripture study habits, and attitudes towards reading scripture.

Example questions: The last time you read the scriptures, how long did you read? I read the scriptures even when no one asks me to. (Agree or Disagree) I have a purpose in mind when I read scripture. (Agree or Disagree)

**What are the benefits to me for taking part in the study?**

There are no direct benefits for taking part in this study. Some of you may find more meaningful
ways to read and ponder the scriptures, but that benefit is not guaranteed. Metacognition has
been shown to help students of all skill levels improve their ability to learn, including students
with learning disabilities. The purpose of this study is to see if metacognition can be helpful
when applied to scripture study. This study might also give other teachers ideas about how to
help seminary students get the most out of their scripture study.

Can anything bad happen if I am in this study?
We think there are few risks to you by being in this study. Some of you might become
frustrated, or feel bad because of some of the questions we ask. You don’t have to answer any of
the questions you don’t want to answer. You can quit at any time, for any reason, if anything
makes you feel uncomfortable.

Who will know that I am in the study?
We won't tell anybody that you are in this study and everything you tell us and do will be
private. Your parent will know that you took part in the study, but we won't tell them your
answers to any of the survey questions. When we tell other people or write articles about what
we learned in the study, we won't include your name or that of anyone else who took part in the
study. All your answers will be confidential. Not even your teacher will know which answers
belong to you.

Do I have to be in the study?
No, you don't. The choice is up to you. No one will get angry or upset if you don't want to do
this. You can change your mind anytime if you decide you don't want to be in the study
anymore.

What if I have questions?
If you have questions at any time, you can ask us and you can talk to your parents about the
study. We will give you a copy of this form to keep. If you want to ask us questions about the
study, contact Trevor Pearce at 801-543-2950, or pearcets@ldschurch.org.

There will be no compensation for being in this research study. Before you say yes to be in this
study what questions do you have about the study?

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

Name (Printed): Signature: Date:
Survey of Student Scripture Study

Please do not put your name on this paper! Instead, please the same random 4-digit number (maybe the last 4 of your cell phone) that you used on your first survey. If you did not take this survey once before, please do not take it now.

Number ____________________  Teacher_______________ Period___________

How much do you agree with the following statements?

- 1 means Not at all
- 2 means Mostly disagree
- 3 means Neither agree nor disagree
- 4 means Mostly agree
- 5 means Totally agree

A

1. I am a capable scripture reader
   1 2 3 4 5

2. I value scripture study as an important way of learning the Gospel of Jesus Christ
   1 2 3 4 5

3. I want to continue learning from the scriptures even when I do not have a scripture reading assignment
   1 2 3 4 5

4. I read the scriptures even when no one asks me to
   1 2 3 4 5

5. I am confident in my abilities as a scripture reader
   1 2 3 4 5

6. I believe effective scripture study is important
   1 2 3 4 5

7. Reading the scriptures is an important part of my life
   1 2 3 4 5
8. I don’t procrastinate scriptural reading assignments

9. When I read the scriptures I am confident that I will understand the important information in the text

B

1. I read the scriptures daily

2. I use study tools like footnotes, chapter headings, the topical guide, or Bible Dictionary to enhance what I am learning in the scriptures

3. I don’t read the scriptures very often

4. When I read, I try to stay focused until I am finished

5. I try to apply things I learn in the scriptures

6. I find myself easily distracted when reading

7. I often forget to read the scriptures

8. I put a lot of effort into my scripture study
9. I write things down or annotate my scriptures while I read them
   1  2  3  4  5

10. When you read the scriptures, how many minutes do you usually spend?
    ____________________

11. The last time you read the scriptures, how long did you read? ____________________

12. In the last week, how much time did you usually spend reading the scriptures at one time?
    a. ____________________

13. How many days in the last two weeks have you read the scriptures? 0-14.
    ____________________

Q
1. I get what I am supposed to out of scripture study
   1  2  3  4  5

2. I find scripture study to be relevant to my life
   1  2  3  4  5

3. I find scripture study to be a positive experience
   1  2  3  4  5

4. Scripture study is discouraging because the scriptures are hard to understand
   1  2  3  4  5

5. I am good at retaining and recalling important information from the scriptures
1. I find myself reading more than I planned because I get interested in the scriptures.
   1 2 3 4 5

2. I enjoy reading the scriptures
   1 2 3 4 5

3. I look forward to reading the scriptures
   1 2 3 4 5

4. I get excited when I learn something new from reading the scriptures
   1 2 3 4 5

5. I find myself getting bored when reading scripture
   1 2 3 4 5

6. My mind wanders while reading scripture
   1 2 3 4 5

I put forth a good effort in trying the reading strategies presented to me for this study over the last 10 class sessions
   1 2 3 4 5
Please do not put your name on this paper! Instead, please put the same random 4-digit number (maybe the last 4 of your cell phone) that you used on your first survey. If you did not take this survey once before, please do not take it now.

Number ____________________  Teacher ________________  Period ___________

Metacognitive Awareness of Reading Strategies Inventory

Directions: Listed below are statements about what people do when they read academic or school-related materials such as textbooks or library books. Five numbers follow each statement (1,2,3,4,5), and each number means the following:

- 1 means “I never or almost never do this.”
- 2 means “I do this only occasionally.”
- 3 means “I sometimes do this” (about 50% of the time).
- 4 means “I usually do this.”
- 5 means “I always or almost always do this.”

After reading each statement on the following page, circle the number (1,2,3,4, or 5) that applies to you using the scale provided. Please note that there are no right or wrong answers to the statements in this inventory.
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a purpose in mind when I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. I take notes while reading to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. I think about what I know to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. I preview the text to see what it’s about before reading it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. When text becomes difficult, I read aloud to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. I summarize what I read to reflect on important information in the text.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. I think about whether the content of the text fits my reading purpose.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. I read slowly but carefully to be sure I understand what I’m reading</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. I discuss what I read with others to check my understanding.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. I skim the text first by noting characteristics like length and organization.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>11. I try to get back on track when I lose concentration.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. I underline or circle information in the text to help me remember it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13. I adjust my reading speed according to what I’m reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14. I decide what to read closely and what to ignore.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. I use reference materials such as dictionaries to help me understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>16. When text becomes difficult, I pay closer attention to what I’m reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>17. I use tables, figures, and pictures in text to increase my understanding.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. I stop from time to time and think about what I’m reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>19. I use context clues to help me better understand what I’m reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>20. I paraphrase (restate ideas in my own words) to better understand what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>21. I try to picture or visualize information to help remember what I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>22. I use typographical aids like boldface and italics to identify key information.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>23. I critically analyze and evaluate the information presented in the text.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>24. I go back and forth in the text to find relationships among ideas in it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>25. I check my understanding when I come across conflicting information.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>26. I try to guess what the material is about when I read.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>27. When text becomes difficult, I reread to increase my understanding.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>28. I ask myself questions I like to have answered in the text.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>29. I check to see if my guesses about the text are right or wrong.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>30. I try to guess the meaning of unknown words or phrases.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>