THE RELATIONSHIP BETWEEN THE USE OF METACOGNITIVE READING STRATEGIES AND STUDENT RETENTION IN HIGHER EDUCATION

by

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DISSERTATION

Presented to the Faculty of

The University of Houston-Clear Lake

In Partial Fulfillment

Of the Requirements

For the Degree

DOCTOR OF EDUCATION

in Educational Leadership

THE UNIVERSITY OF HOUSTON-CLEAR LAKE

May, 2020

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Dedication

For my son, whose chill attitude and flexibility have made parenting a middle-schooler while working and working on a doctorate so much easier.

For my mom, who has without complaint stepped up to keep us fed and in clean clothes while I work and pursue this degree. Couldn't have done it without you.

Acknowledgements

I would like to thank my committee members for their individual contributions to this process:

Dr. Jana Willis, for helping me whip a rough and slightly impractical research idea into shape as a workable and meaningful study.

Dr. Renee Lastrapes, for teaching me statistics, pursuing multiple ideas on ways to analyze my data and patiently tolerating my personal aversion to SPSS.

Dr. Elaine Hendrix, who supported my initiative to include reading strategy support in the Academic Coaching program, which eventually inspired this project.

Dr. Roberta Raymond, for serving as my faculty advisor and welcoming me into her nest of Reading Specialist students, as well as crafting my assignments to be meaningful professionally and to this project.

Finally, Dr. Heather Pule, for hopping onto this really fast-moving bandwagon almost the moment she arrived and being open to exploring some really Quant-y Qual methodology.

ABSTRACT

THE RELATIONSHIP BETWEEN THE USE OF METACOGNITIVE READING STRATEGIES AND STUDENT RETENTION IN HIGHER EDUCATION

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Student retention is a major issue that has spanned multiple decades in higher education in the United States, corresponding with greater access to higher education and a rise in non-traditional students. Innumerable challenges can interfere with a student's academic performance or ability to remain in and complete a degree program. All manner of recruiting and retention programs exist across the U.S. aimed at supporting at-risk students, promoting positive study habits and bridging knowledge gaps in content areas and higher education culture. However, such programs are not typically designed to develop critical thinking and self-regulation, particularly in academic reading. Reading university-level texts while employing higher-order thinking skills and self-regulation, known as metacognition, is a crucial academic skill lacking in most undergraduate university students. It is possible that institutions of higher education could strengthen student retention by integrating metacognitive reading strategy instruction into the curriculum and/or support programming. This mixed methods explanatory study examines the possible relationship between the level of student use of metacognitive reading strategies and their retention, and is framed on a triad of theories: Tinto’s Student Integration Model of retention, Flavell’s Model of Cognitive Monitoring and Heider’s Attribution Theory.

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CHAPTER I:

INTRODUCTION

Thousands of students enter our nation's higher educational institutions each year (U.S. News and World Report, 2015), with their own hopes, dreams, and goals. It is unlikely that any begin their college education with a plan to not finish their degree. Unfortunately, the reality of degree non-completion is and has been an unfortunate trend in the United States in recent decades, corresponding with overall greater access to higher education and a rise in the number of non-traditional students (Hunsaker & Thomas, 2013). In fact, over half of all U.S. undergraduate students do not earn a certificate or complete a degree within six years of starting post-secondary education (Dept. of Education, 2012). As a result, the nearly 950 universities and community colleges (U.S. News and World Report, 2015) which currently educate more than half the nation's undergraduates (American Association of Community Colleges, 2017) have the goal of increasing satisfactory retention rates of undergraduate students and ultimately ensuring their graduation (Ahuna, 2011).

Innumerable challenges can interfere with a student's academic performance or ability to remain in and complete a degree program. Many barriers to success are related to student background and circumstances, such as financial hardship or lack of family support (Ahuna, 2011). These issues are most prevalent in the increasing population of low-income, minority, and first-generation students, categories that may but do not necessarily overlap (Atherton, 2014). Some of these challenges may be mediated by support programming that provides peer instruction and group problem solving, as well as guidance in academic strategies for students academically underprepared by high school or community colleges (Hesser, 2015). Though not consistently effective, there are all manner of recruiting and retention programs across the U.S. aimed at supporting at-risk students, as well as the university population at large (Winkler, 2015). These programs often promote positive study habits and seek to bridge gaps in content knowledge as well as higher education culture. While such programs address many issues that may put students at risk, the programs are often not designed to develop more specific academic skills such as critical thinking ability and self-regulation (Ahuna, 2011).

Statement of the Problem

Reading university-level texts while employing higher-order thinking skills and self-regulation, known as metacognition, is a crucial academic skill (Chevalier, Parrila, Ritchie, & Deacon, 2017; Carlston, 2011) lacking in most university students from entry to senior level (Cummings, 2015). Yet, metacognition and reading strategies are often not addressed through student courses or academic support programs. (Stahl & Armstrong, 2018; Perin, 2013). It is possible that institutions of higher education could strengthen student success and thereby retention by integrating this underdeveloped essential academic skill into instruction and/or support programming.

Significance of the Study

As higher educational institutions grapple with the task of making education accessible while maintaining standards toward degree completion, the challenge will be meeting the myriad needs of the increasingly diverse learning community (Department of Education, 2017; Thomas, 2014). While many higher education programs address the financial, social, and academic content area support necessary to student success, it seems that there are few university initiatives including metacognitive reading strategies as part of an effort to promote critical thinking in students (Drayton, 2016; Doolittle, Hicks, Triplett, Nichols, & Young, 2006). This study will investigate if and how students use advanced reading strategies and if there are quantifiable effects on retention rate. Higher education instructors and administrators could utilize this strategy use data to inform curricular and academic support service decisions as they work toward improving retention.

Research Purpose and Questions

The purpose of this study is to examine the relationship between the use of metacognitive reading strategies and retention rates in undergraduate university students. The questions this study seeks to answer are:

1. Is there a relationship between the use of metacognitive reading strategies and student retention in higher education?
2. Is there a difference in the number of metacognitive reading strategies used based on subject area?
3. How do metacognitive reading strategies affect student perceptions of schoolwork?

Definition of Key Terms

Retention Rate- the rate of students who re-enroll in the subsequent academic year (Chronicle of Higher Education, 2015)

Non-Traditional student- a student who has one or more characteristics not traditionally associated with college students, such as higher age, full-time work, independent living, or being a parent (National Center for Education Statistics, 2015)

Reading Strategy- strategies for examining and comprehending text, including activating prior knowledge, predicting, questioning, visualizing, clarifying, rereading, constructing meaning, and summarizing or describing main points (Trice & Johnson Wilmes, 2011)

Metacognition- a learner's awareness of how much they understand about a topic, and ability to choose effective strategies to learn the specific areas not yet mastered (Cummings, 2015; Larmar & Lodge, 2014)

Executive Function- a group of interconnected neurocognitive processes contributing to goal-oriented behaviors, such as inhibition of reading irrelevant material and shifting to a new reading topic (Jake Follmer & Sperling, 2018)

Critical Thinking- also called higher-order thinking, involves application, analysis, and evaluation of content or arguments, moving beyond factual understanding or memorization; also corresponds to the higher levels of Bloom's Taxonomy (Jensen, 2014)

Metacognitive Reading Strategy- reading strategy that incorporates critical thinking and metacognition for deeper comprehension, application, and self-regulation of learning (Nash-Ditzel, 2010).

Academic Coaching- programming with one-on-one interactions between academic coaches, who may be professional or carefully trained peers, and students, for the purpose of the student setting and achieving personal academic goals; sessions may include work on study skills and time management, as well as facilitation of campus involvement. (Robinson, 2010)

Supplemental Instruction- a support program utilizing tutors embedded in courses with high rates of D's, Withdrawal, and Fs's (DFW rate), including supplemental review sessions and test preparation sessions (Ahuna, 2011)

Study cycle- the cyclical, multi-stage process of study which includes Previewing, Lecture, Reviewing and Studying as major tasks, with a variety of effective reading, note-taking and study strategies as subtasks within (Christ, 1997).

*Think-aloud protoco*l- Also called verbal protocol analysis, a method of research in which participants think out loud as they work through a problem-solving task, which can include tasks like writing an essay or reading a text (Hayes & Flower, 1980).

Conclusion

With higher education student retention rates persisting at undesirably low levels, colleges and universities need to take a comprehensive look at their institutional student makeup to recognize special populations and needs. In this process, academic success must be addressed through student skill development in support programs and curricular design, in addition to commonly existing programming that addresses financial, social, and student engagement issues. The present study will test the theory of a possible relationship between student utilization of advanced reading strategies and student retention rates in order to establish if widespread instruction in such strategies through courses and support programs could serve as a retention booster.

CHAPTER II:

REVIEW OF LITERATURE

The Retention Issue in U.S. Higher Education

Retention and graduation rates emerged as a trending topic in the 1970s, after roughly three decades of gradually increasing public access to higher education, which was previously available only to a privileged class. This trend was largely a result of post-World War II funding for veterans under the Montgomery G.I. Bill and later the civil rights movement; both developments encouraged more open admissions policies (Hunsaker, et al, 2013; Perin, 2013). These events were major factors in the rise of non-traditional students, those students who are of an age and/or living situation outside the traditional norm of living on campus or with parents while attending college directly or shortly after high school. Non-traditional students are also more likely to be from minorities, to be first-generation, and have less rigorous academic preparation (Hunsaker, et al, 2013; Perin, 2013). Before this shift in educational access, higher education graduation rates were historically high, as the more affluent classes who were receiving a college education were rigorously prepared and therefore very likely to succeed academically and complete a degree program (Hunsaker, et al, 2013). With the influx of students who were older and typically less academically prepared, larger portions of students dropped out prior to graduation, sometimes as early as the first year. As this trend continued, research in sociological, academic, and financial interventions was initiated. Tinto (1975) theorized in the mid-70s that there was a positive correlation between students' campus integration and success rates. A clear definition of campus integration proved rather elusive throughout the next decades, and by the 1990s, internal campus support factors such as faculty: student ratios and financial aid accessibility emerged as more specific variables under investigation (Ozna & Sukhnandan, 1998).

Murtaugh, Burns, and Schuster later confirmed admissions criteria as a reliable gauge for graduation rates. The more prepared a student was upon entry, as measured by factors like high school course load and admissions test scores, the more likely the student was to graduate (1999). In the mid-2000s, Singell and Stater (2006) utilized quantitative evidence to investigate correlations between other components and graduation rates. One such component was financial aid availability, which they found to be a significant factor in degree completion, particularly for underrepresented populations. Hunsaker and Thomas's 2013 study, which utilized 2006 data from 30 land-grant institutions, found admissions rigor was not a significant indicator of graduation rates, possibly because standardized testing such as the Scholastic Aptitude Test (SAT) cannot reveal the complete nature of academic rigor, which involves other elements such as self-regulated learning and grit.

As of 2012, the U.S. Department of Education reported that less than half of the students entering higher education graduated with a degree within a 6-year time period (DOE, 2012). 2010 figures reveal that about 68% of high school graduates enrolled in four-year institutions; however, 25% did not persist beyond the first year (Gorzycki, Howard, Allen, Desa & Rosegard, 2016). The 2017 Chronicle of Higher Education report on retention claims that the bachelor's degree 6-year graduation rate in the US is now just under 60%. This number suggests improvement with the need for further thoughtful intervention to continue improving the retention and graduation rate, particularly with rising numbers of at-risk populations in higher education.

Special Populations

There are a variety of special populations that both enrich the higher education environment and arrive with social and academic needs that can prove barriers to retention and graduation (Ishitani, 2016; Soria & Stebleton, 2012). Special population demographics may vary by geographic location and other factors like institutional admissions standards and tuition rates. Though each of these special populations has unique challenges that threaten retention, these groups may also benefit from shared solutions.

Non-traditional Students

With increased access to higher education in the second half of the 20th century in the US came the advent of the non-traditional student. A student is generally considered non-traditional if they meet at least one of these factors: independent status for financial aid purposes, having a dependent, part-time enrollment, full-time job, GED or high-school equivalency rather than diploma, or entering college after a significant gap post-high school (NCES, 2015). From 1995-present, over 70% of US college students could be considered non-traditional based on having at least one of the characteristics mentioned (NCES, 2015).

Many students meeting this classification may be better described as “employees who study” rather than “students who work” (Hutchens, 2016, p.11). Hutchens explains that this does not mean that non-traditional students typically perform poorly; their life circumstances have often fostered useful coping skills, and their work and life experience provide connections applicable to coursework. However, because most non-traditional students are working and/or raising dependents, they typically have significantly less time available for school work compared to traditional students. As an estimated 85% of college learning happens by independent reading (Drayton, 2016), this study time limitation means that ineffective or inefficient reading practices are very likely a natural contributor to student attrition in this group. Jitendra, Burgess & Gajria (2011) note that skilled readers are able to comprehend text not only accurately, but also efficiently. With improved accuracy and efficiency in reading, non-traditional students may find themselves both succeeding more academically but also better able to complete course work in a timely manner.

First-Generation Students

One of the most discussed special populations in recent decades is first-generation students. As defined by TRIO, originally a triad of programs but now an umbrella of 8 federal programs designed to support low-income minority students, a first-generation college student is one whose parents or guardians have never completed a 4-year/bachelor's degree (Johnson, 2015). Among U.S. universities, this is also the most common denotation of first-generation students, who are also frequently referred to as Gen One students (Harackiewicz, Canning, Tibbetts, Giffen, Blair, Rouse & Hyde, 2014; Palbusa & Gauvain, 2017; Ishitani, 2016; Soria & Stebleton, 2012). This group of students is at risk academically because they do not have the benefit of parent knowledge of the college system and advice regarding how to be successful in college study; such information is generally shared with continuing generation students, those students who have at least one parent or guardian with a bachelor's degree **(**Atherton, 2014; Palbusa & Gauvain, 2017; Soria & Stebleton, 2012)**.** First-generation college students are at greater risk of low first semester grades and dropping out within the first year **(**Palbusa, 2017**).** Longer-term data illustrate how the trend continues beyond students' first year, with only 58 percent of first-generation students persisting beyond a third year, versus a 77 percent retention rate for continuing generation students (Ishitani, 2016).

While first-generation students are not necessarily low-income, the vast majority of low-income college students are also first-generation (Atherton, 2014). There have now been five decades of federal programs aimed at the particularly at-risk students at the cross-section of low income and first-generation, such as Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) and Upward Bound. Despite these federally coordinated support efforts, low-income student college degree completion has risen by only 3% during that time, while the increase in degree completion among wealthy students was 40% (DOE, 2015).

Gen One students are often at additional risk due to life circumstances. They are typically older and more likely to live independently or have their own family. By extension, they are more likely to be attending school on a part-time basis while working and are more prone to life circumstances necessitating withdrawals and re-enrollment (Hunsaker & Thomas, 2013; DOE, 2015). Not all risks are tangible, however; affective factors also have significant effects on student success.

First-generation students are more likely to report a fear of failure and feeling underprepared (Atherton, 2014; Palbusa & Gauvain, 2017). Stephens, Townsend, Markus, and Phillips (2012) report that first-generation students had higher levels of the stress hormone cortisol, indicating situational stress and negative emotions, when academic activities were designed as independent tasks rather than interdependent, such as group work. Gen One students are also more likely than continuing generation students to be members of ethnic minorities and experience the related issue of lower performance on tests and assignments due to stereotype threat (Appel & Kronberger, 2012). The affective factors and outside circumstances inherent to first-generation and non-traditional students often lead to feeling overwhelmed and contribute to the high drop-out rates. Metacognitive strategies, in addition to improving academic performance, allow a student to develop and exercise control over their learning process; in turn, this sense of control often increases student motivation and the desire to continue learning (Bauer, 2014).

Are there academic interventions that could address both the issue of academic skills improvement and also affective barriers while not singling out students for intervention, simply as a component of classroom instruction? Self-Directed Learning (SDL) is a good candidate for addressing this multifaceted need. Instructors engaging in the SDL model explain and engage students in learning strategies that provide decision-making and problem-solving opportunities, refraining from telling students what to do at every step (Khodabandehlou, Jahandar, Seyedi, & Abadi, 2012). SDL strategies employed in group work in the classroom include text prediction, summarizing, question generation and clarification of unknown or unclear content. These SDL practices develop not only domain-specific knowledge but also the ability to transfer concept knowledge to new situations, including new courses and content while building independent reading abilities. Perhaps even more promising in terms of solving the complicated retention puzzle and better equipping First-Generation students is the finding that Self-Directed Learners are “motivated and persistent, independent, self-disciplined, self-confident and goal-oriented”; in short, “more effective learners and social beings” (Khodabandehlou, et. al, 2012, p.2)

English Language Learners

Another sizable population in U.S. universities is students for whom English is a second and less proficient language. Students in this category may be either international students having entered the U.S. specifically for study using a student visa, or resident or citizen students who likely immigrated to the U.S. at some point during their childhood or adulthood. While there is an unfortunate lack of data on the number of students in the latter category, international students now number 1.18 million in higher educational institutions across the U.S., according to figures from the Department of Homeland Security’s Student and Exchange Visitors Information System (The PIE News, 2017). While all accredited institutions of higher education in the U.S. require a minimum language proficiency test score, most commonly the Test of English as a Foreign

Language (TOEFL) exam, this is not by any means a guarantee that international students are fully prepared linguistically to cope with academic studies in English (Martirosyan, Hwang, & Wanjohi, 2015). Martirosyan, et al describe a 2010 meta-analysis of 22 studies on U.S. international student language proficiency and school performance spanning over two decades, which found that TOEFL scores were not a strong indicator of a student's performance academically, as measured by course completion or Grade Point Average (GPA). International students are more likely to lack academic conversational skills necessary for course discussions and public speaking, have difficulty with listening comprehension at typical lecture speed and often continue to struggle in pace and comprehension of academic reading, as well as mechanics and rhetorical styles common to U.S. academic writing (Martirosyan, et al, 2015).

While the vast majority of U.S. colleges do not track data related to English proficiency status for U.S. residents and citizens, the scope of this student population can be surmised by looking at two figures: an NCES estimate that almost 25% of U.S. community college students were of an immigrant background (Flores, 2014), and the number of students designated as an English Language Learners (ELLs) in the U.S. K-12 system, 4.6 million as of 2015 (NCES, 2017). In addition to this number are the many students who were formerly classified as ELLs and in later grades were considered sufficiently proficient to lose the ELL classification and participate in fully English medium courses with no further language support. This change in label and course enrollment does not mean that the students in this situation are fully fluent in academic English, however, and such a language deficiency can greatly increase the risk of student attrition in higher education. A 2012 study analyzing writing samples including those of current adult community college English Language Learners and Generation 1.5 students, a term for students who had a different language used at home but had been educated at least 4 years in the U.S. and fluent in oral English, found that Generation 1.5 students still made more errors in a variety of grammatical structures than native speakers and also made different types of verb errors than either the native speakers or ELLs in the study (Perin, 2013). As in other at-risk groups, among ELLs, reading skills are also frequently a devastating deficiency (Martirosyan, et al, 2015). In fact, scholars widely agree that developing high proficiency in reading is one of the most difficult skills for second language learners (Cakici, 2017).

Being an English language learner could potentially be an academic disadvantage. However, it is important to note that low second language proficiency is not a disability and does not qualify students for accommodations as does a physical or learning disability. Learning disabilities are another important category to explore in the effort to understand at-risk students.

Learning Disabilities

The number of students with learning-related disabilities enrolling in post-secondary institutions is rising year to year (Chevalier, et al, 2017; Lombardi, A. R., Murray, C., & Gerdes, H., 2012; Lee, I., Rojewski, J., Gregg, N., & Jeong, S., 2015). This group of students lives with any number of disabilities that affect emotional and cognitive processes but do not cause intellectual disability. Common examples include but are not limited to Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder (ADD/ADHD), Autism Spectrum Disorder (ASD), Generalized Anxiety Disorder, Post-Traumatic Stress Disorder (PTSD), Depression and Bipolar Depression, Traumatic Brain Injuries (TBIs), dyslexia, and dysgraphia (Chevalier, et al, 2017; Cortelia & Horwitz, 2014). Despite 94% of students with learning disabilities having received accommodations in high school, only 17% of those students with learning disabilities enrolled in higher education received accommodations. While some of those students face challenges with inadequate documentation concerning their condition, most students with learning disabilities do not request any accommodations upon entering a community college or university (Lombardi, et al, 2012; Lee, et al, 2015). Reading difficulties are a common issue among students with a variety of disabilities beyond visual and reading disorders, such as ADD/ADHD, emotional and mental health issues, and Autism Spectrum Disorder, often due to the struggles with focus, cognitive load and determining the relevance of information that these disabilities often create (Abreu-Ellis, 2009). This group is even more unlikely than other college students to know and practice metacognitive reading and learning strategies, which would help them to regulate their learning, adjust ineffective learning behavior, and identify a need for academic support in a timely manner (Abreu-Ellis, 2009). According to both Lombardi and Lee's studies, students with learning disabilities have lower persistence rates and are more likely to attend part-time, leading to lower graduation rates and a longer time frame to graduation for those who do succeed in completion.

In summary, there are many groups of students who face additional challenges in completing a college degree. The number of non-traditional students, first-generation students, ELLs, and students with learning disabilities all continue to rise in the nation's higher education system, meaning it is crucial to develop effective, comprehensive academic support through programming and curricular design to increase retention and ultimately degree completion rates for these at-risk students and all students (Winkler & Sriram, 2015; Chevalier, et al, 2017; Soria & Stebleton, 2012).

Academic Preparedness

A major factor in retention is the academic readiness of students upon entry, and it appears there is plenty of room for improvement on this front. The National Center for Public Policy and Higher Education and the Southern Regional Education Board reported in 2010 that almost 60% of entering freshmen, though fully academically eligible for admission, discovered they were underprepared for postsecondary work (Gorzycki, et al, 2016). Perin cites low reading and writing skills in a significant number of U.S. postsecondary students, stemming from inadequate K-12 instruction, low English language proficiency, learning disabilities, poor motivation, and obstacles common to low socioeconomic and/or racial and ethnic minority status (2013). These groups of students have much less opportunity for college preparatory courses in high school. Due to less rigorous coursework, their likelihood of having language deficits is also higher (Gorzycki, et al, 2016). Other reading challenges may stem from atypical neuro patterns. Students on the Autism Spectrum, along with students with learning disabilities, often struggle with the transition from “learning to read”, that period in elementary school where decoding, reading fluency and basic comprehension are the focus of instruction, to “reading to learn”, the process introduced in the later elementary grades and developing gradually throughout the middle and higher grades, where students read content in order to learn the information (Carnahan & Williamson, 2013; Jitendra, et al, 2011). Jitendra, et. al. (2011) cite an absence of appropriate cognitive strategies or ineffective strategy use as sources of reading comprehension struggles in students with learning disabilities. Academic preparedness is not an issue limited to these groups of at-risk students, however.

While many students are markedly unprepared for higher education academically due to disadvantages inherent to their situation within a special population, there are indications that even public high school students across the U.S. who are adequately prepared in terms of content knowledge, as evidenced by high school course offerings and GPA, are typically still underprepared in crucial academic skills. Many experts attribute this lack of preparedness to high-stakes standardized testing throughout K-12 education, which influences curricular design and limits the time spent fostering higher-order skills (Good, 2009). MacMillan (2014) asserts that "surface approaches to reading that are rewarded in high school" fail to foster development of deeper comprehension necessary in higher education (p. 943). Bauer (2014) asserts that despite some metacognitive strategies being taught throughout K-12 courses, many students do not develop requisite skills for metacognition, causing them to struggle at various levels of education and if pursuing higher education, enter college underprepared for the demands, particularly in reading. Bauer (2014) further suggests that many students classified as developmental are not unable to do college-level work, but simply do not know how to actually use strategies they were likely earlier exposed to in K-12. Weller (2010) reports that recent undergraduates are perceived by many faculty to have lower levels of literacy than those who came before them and seem less prepared for reading at the university level. Resulting from one or many factors, academic skill deficits common to all student groups include reading comprehension, metacognition, and critical thinking.

Academic Reading Proficiency

Academic reading proficiency (Gorzycki et al, 2016) is "characterized by the ability to perform cognitive tasks associated with interpreting text" beyond the reading basics such as decoding words and pulling out facts and opinions from texts, and is inclusive of higher-order skills such as making inferences, comparing/contrasting ideas, understanding the purpose of text and author's intent and possible bias, and evaluating arguments and the level of evidence supplied in the text (p. 14). It is widely accepted that reading for information is a multidimensional, complex, and interactive process (Cakici, 2017; Pascual & Goikoetxea, 2014; Ahmadi, Ismail, & Abdullah, 2013). The National Center for Education Evaluation and Regional Assistance has determined that effective readers have the following skills: decoding and reading fluently, developing vocabulary knowledge and oral language skills, integrating information from other disciplines to construct deeper meaning, utilizing a variety of cognitive learning strategies, making inferences and evaluating content, and engaging in mental effort and motivation in the pursuit of academic goals (Trice & Johnson Wilmes, 2011). These types of reading skills qualify as higher-order tasks, crucial to the development in students of critical thinking, which is a major goal of U.S. higher education (Cummings, 2015).

Reading is a major factor in autonomous student learning and college success, though there is generally a disconnect between students, who tend to underestimate its importance, and faculty, who consider textbook reading and comprehension essential to academic success (Gorzycki, Howard, Allen, Desa & Rosegard, 2016). Students may not even attempt the required readings for their college courses; Carlston reports that in one study, nearly 70% of students sampled indicated they had not read or barely read any of purchased texts. Another study cited by Carlston (2011) found less than one-third of students had read their text pre-lecture and just over two-thirds had read the necessary chapters before the exam. Of those who do read, the typical pattern is one where the student reads on his own, often with a misguided approach, comes to class to have that reading “supplemented and corrected” by the instructor, and later tries to replicate the expert reading of the instructor on an exam or when writing a paper, essentially regurgitating the information and not having developed their own reading expertise in the process (Weller, 2010, p.88).

There are a variety of descriptions of struggling readers that can include students with reading disabilities, the underprepared or simply the unmotivated, but the consensus is that struggling postsecondary readers are those not successfully meeting the academic challenge of college-level materials, and this lower literacy causes problems beyond the classroom from job advancement to consumer decisions (Drayton, 2016). Eckert (2008) defines and describes a gap in pedagogy between secondary and postsecondary instruction of reading and interpretations. Eckert (2008) confirmed results of previous studies indicating a wide difference in high school teacher and college perceptions of student readiness for college work. Eckert's study reports that 41% of professors surveyed believed students in general were unprepared for college-level work, while only 15% of high school teachers believed students were underprepared. This perception gap may explain the corresponding gap in the literacy pedagogy.

Not surprisingly, post-secondary faculty in numerous studies cited low academic reading skills as a significant factor in student attrition (Carlston, 2011; Gorzycki, et al, 2016; Pascual & Goikoetxea, 2014; Manarin, 2012). In a 2002 survey of California State University faculty, 83% of the 402 respondents indicated a lack of analytical reading skills as a factor in student failure, also claiming that less than half of the students had satisfactory skills in text summarizing, text analysis, multiple source synthesis, and critique of arguments in text (Gorzycki, et al, 2016). A lack of reading strategy utilization is likely to blame, but a key question is whether or not students are aware of what reading strategies are and how to utilize them.

Reading strategies come in many forms, but all involve a student approaching a text deliberately, employing some method of handling information. The majority of undergraduates possess only a surface level understanding of academic tasks because of the haphazard way in which they approach the reading, rather than a critical analysis (Lordan & Sole, 2017). Braten and Stromsa (2011) and Khodabandehlou, et. al, (2012) state that reading less actively, in a linear, word-for-word fashion without using strategies or pausing to consider meaning is a hallmark of poor readers in higher education, whereas effective reading is described by Lordan and Sole (2017) as an "intense intellectual activity" that integrates the text with the student's existing knowledge, “expectations”, and “motivations” (p. 38). The frequent lack of knowledge connections being made by students is described as “compartmentalism” by MacMillan (2014), who notes that “many students seem to leave all prior experience outside the door as they enter our classes” (p. 945). Only 30% of students in Manarin’s 2012 study reported connecting information from readings with other knowledge.

Academic texts often require additional skills and effort from the reader. Good readers often “jump back and forth” in texts and “distribute attention unequally”, focusing on particular sections of text more than others (Braten & Stromsa, 2011, p. 112) as well as draw on prior knowledge and experience to better comprehend text (Cakici, 2017). Good readers employ other actions, such as planning and organizing (Cakici, 2017). Lordan and Sole (2017) share the basis of work done by Norris and Phillips (2009), in which reading is described as “iterative and recursive”, as well as interactive, as the reader must interact with the text to make sense of it and then ultimately make a choice as to what interpretation makes the most sense based on context and logic.

Reading is considered one of the most crucial academic tasks, “the essence of all formal education information” (Bharuthram, 2012, p. 205). Bharuthram explains that as text is the main source of information, poor reading comprehension results in inadequate learning of information and subsequently results in poor academic performance.

The Role of Writing

According to Perin, the act of academic writing, like reading, is an iterative process applying three component skills, which are planning, composing, and revising text. Writing and reading are interconnected in academics, overlapping in cognitive processes despite having some unique skill requirements. Perin cites others who confirm that writing fosters reading comprehension, while reading, in turn, may improve writing skills (2013).

Reading and writing have long been approached separately in higher education, often to the detriment of students. While each skill has some unique requirements, writing activity fosters growth of reading comprehension and conversely, analytically reading well-written texts can improve writing skills by providing sample frameworks on how to logically develop ideas in various rhetorical styles (Perin, 2013). Graham and Hebert (2011) emphasize the complementary nature of reading and writing, which are dependent on shared knowledge and processes. Daane (1991) had put forth this idea earlier, detailing that both skills are recursive and involve planning, drafting, aligning, revising and monitoring the process between readers and their text interpretation, meaning that ultimately, both reading and writing require similar processes of constructing meaning. Stahl and Armstrong (2018) urge higher education institutions to offer a balance of reading and composition instruction, resisting the trend to focus too heavily on composition and use instructors trained in composition or rhetoric with little or no reading instructional training or explicit applications of rhetorical knowledge to reading text.

The writing process employs a variety of rhetorical styles, all of which are best accomplished through a writer analyzing and organizing ideas based on logical relationships. The successful writing process includes gathering and synthesizing one's own and others' ideas, communicating these connected ideas; writing, editing and rewriting to check clarity and accuracy; ultimately developing a unified, logical flow of information (Kolb, Longest & Jensen, 2012). Thus, the writing process parallels the processes successful students use when reading and handling information, self-regulating their learning process as explained by Larmar and Lodge (2014) and enhancing students' critical thinking skills (Kolb, et al, 2012).

Critical Thinking and Metacognition

While there is little evidence available to support the idea that critical thinking can be effectively taught through explicit instruction, it is evident that the right kind of task, one that requires multiple levels of reasoning and adjusting said reasoning in the face of new information, can potentially reposition student thinking from lower to higher-order. This idea put forth by Sargent & Borthick (2013) was put to the test in their study investigating the possible relationship between cognitive conflict task experience and better performance in both readings-only and in courses later on, as well as upper-level courses in general. In other words, the study measured whether accounting students developing critical thinking skills through "ill-structured" (p. 761) tasks requiring information processing would result in the students transferring those critical thinking skills to other courses and making measurable gains in performance.

There are myriad research studies and programs fostering student engagement or improvement of specific skills such as developmental reading or writing as retention efforts, but far less focus has been on student ability to take ownership of their learning process, of which reading plays a major role. Metacognition is a term used to describe an individual's capability to understand their deficiencies in knowledge and discriminate between personally effective and ineffective methods of study (Larmar & Lodge, 2014; Saenz, 2017). Flavell, in his 1979 seminal work, created a Model of Cognitive Monitoring that included metacognitive knowledge, metacognitive experiences, goals or tasks, and actions or strategies.

According to Frith (2012), there are both implicit and explicit modes of metacognition, which are evident in social interactions as well as academic pursuits. Implicit metacognition is demonstrated when an individual shifts to "we-mode", a state in which they automatically factor in others' knowledge and intentions, though perceptions are not necessarily accurate. In contrast, explicit metacognition provides individuals with the ability to examine their own behavior and justify it to others. Behavior and attention-related metacognition is known as “mentalizing”.

Metacognition involves three key varieties of knowledge: declarative, or knowing “that” a particular strategy can serve a certain purpose in learning; procedural, or knowing “how/when/where” to apply that strategy in a learning task; and conditional, or knowing “why” or in what situations a strategy needs to be used or adjusted (Nash-Ditzel, 2010, p.46; Ahmadi, et al, 2013). Together, these types of knowledge allow a cycle of strategic planning to take place while reading, through first assessing a task’s difficulty compared to the reader’s ability and how effective a selected strategy will be for said task, then regulating themselves by monitoring progress and adjusting the planning based on the results of their self-evaluation (Nash-Ditzel, 2010).

Successful learners demonstrate effective organization and efficient utilization of metacognitive knowledge, effective monitoring and regulation of learning, skillful assessment and flexible strategization, as well as reflective and reactive learning. Post-secondary honors students share certain characteristics: intellectual ability, metacognitive skillfulness, expertise, strategic ability and self-regulation (Barnes, 2012), whereas poor performing university students consistently overestimate their upcoming exam performance, and the reason is they simply do not know what they do not know (Saenz, et al, 2017). This lack of awareness is in direct contrast to the cognizance of high performers, who generally demonstrate strong metacognitive skills. In fact, Saenz asserts that a student’s capacity to monitor their learning accurately predicts their grade point average. This is significant to note, as grade point average is clearly a major factor in student retention and ultimately graduation.

A wide variety of metacognitive reading strategies have been identified in studies, as demonstrated in Table 1. Although there are dozens of metacognitive strategies in use, all strategies have a mutual goal: guiding readers in interacting with content so that their learning becomes “deliberate, self-directed, and self-regulated” (Jitendra, et. al, 2011, p. 136). Self-regulation involves continual use of executive functions and metacognition. Both executive function and metacognition are considered controlled processes that an individual activates, which then allow the individual to flexibly adjust strategies in order to perform new and challenging tasks (Roebers, 2017). In fact, while the subprocesses of executive function and metacognition can be theoretically differentiated for purposes of study, the subprocesses continually interact and inform the other and cannot therefore be readily separated in real life (Roebers, 2017). The iterative nature of executive functions and metacognition pave the way for expository reading, also a recursive task by nature.

Jake Follmer and Sperling (2018) identify expository text comprehension as a “dynamic and complex process” (p. 177) and crucial skill needed to succeed in modern society. Expository text itself is challengingly complex due to its technical vocabulary, high density of facts, unfamiliar content, and cognitively demanding concepts (Roehling, Hebert, Nelson & Bohaty, 2017). According to Jake Follmer and Sperling (2018), three core executive functions are key players in making the comprehension of expository text happen: inhibition, shifting, and updating, all three of which have been linked to academic and cognitive outcomes, including word reading, phonological processes, and writing. One study found that poor readers had observable difficulty in interference control, which in this context would refer to the practice of recognizing and ignoring or paying less attention to less relevant information while reading (Borella, Carretti, & Pelegrina, 2010). Other studies have noted the role of shifting attention during reading, which seems to enable readers to use strategies more flexibly, form new concepts while reading and analyze multiple, often differing, perspectives (Jake Follmer & Sperling, 2018).

According to Chevalier, et al (2017) metacognitive reading strategies are those that utilize metacognition and include consciously monitoring connections between personal cognition and the demands of a learning activity, strategies that involve information summarizing, self and text questioning, making inferences from texts, and drawing connections between new information and prior knowledge. Cakici (2017) states that metacognition is "the key factor required for reading comprehension (p. 72). MacMillan (2014) posits that connections are the basis of how humans think and how we make sense of the world and of texts. Regarding connections in text, MacMillan further explains connections as endogenous, meaning connections within a text, and exogenous, connections between the text and the outside world, citing a 2003 study by Strømsø, Bråten, and Samuelstuen, which found that students with higher rates of exogenous connections performed better on exams. A 2011 study by Kolić-Vehovec, Bajšanski, and Roncević Zubković found that students who more fully elaborated on text connections demonstrated better text comprehension and higher academic achievement. In the goal of retaining and graduating more undergraduate students, higher education institutions cannot simply trust that students have or will develop self-regulatory skills; rather, they must ensure students develop these skills through support programming and thoughtful, intentional course design (Ahmadi, et al., 2013).

Curricular and Instructional Considerations

Beyond potentially having underdeveloped metacognition, new university students have generally not been exposed to higher-level disciplinary content and may have no idea how to approach college-level academic material. Theriault, Matich, Lampi, and Armstrong (2018) reveal that learners in the first and perhaps second year of higher education are in a type of limbo, in which generic, universal reading strategies they may have from high school are no longer sufficient, yet while studying mostly or all general education courses, they do not yet have the exposure to discipline and profession-specific content areas and have therefore had no opportunity to learn discipline-specific strategies. PILLAR is a strategy presented by Armstrong and Lampi (2017) for student use while in this "in-between space" (Theriault, et. al, 2018, p. 2) or in any situations where they may have to read a text on a topic they are unfamiliar with. The strategy is an acronym for the 6 steps contained within: preview the entire text, identify major topics/ concepts, list topics/concepts repeated throughout the text, look quickly online for basic info, attempt to understand these topics/concepts, read the text actively. It is noteworthy that 5 of the 6 steps are pre-reading strategies.

While many content area instructors balk at the idea of being responsible for student literacy, disciplinary literacy is a necessity in the content area classroom, as "neither reading nor English teachers possess the requisite prior knowledge necessary to teach students how to read or write in science, social studies, or mathematics" (Gillis, 2014, p. 621). Hebert, Bohaty and Nelson (2016) advise the explicit teaching of multiple types of expository text structures, as Table 2.1 text structures are helpful to the reader when organizing facts and ideas, which then supports retention and recall. Knowing a text's structure can aid the reader in discovering the author's purpose, organize ideas by levels of importance, and even save processing time by allowing the student to follow the schema already established in the reading, freeing up cognitive resources and increasing ability to comprehend the content (Hebert, et al., 2016). Linder, Airey, Mayaba and Webb (2014) argue that the ultimate goal of any undergraduate degree is creating graduates who are disciplinary literate, which they define as being able to competently manage varied representational formats common in their discipline. Airey (2011a) defines this as the "ability to appropriately participate in the communicative practices of a discipline" (p. 3) and compares undergraduate learning to a complicated process similar to "cracking an intricate disciplinary code" (p. 1).

Bharuthram (2012) argues that higher education institutions have a responsibility to not only increase student awareness of reading's importance, but also to guide student development of suitable reading practices necessary for success in university study. Academic support programs cannot feasibly offer support to the high number of students lacking sufficient reading skills. Bharuthram (2012) asserts that it is crucial for this to be a pan-curricular effort with reading strategies taught in content area classrooms.

Table 2.1.

Compilation of metacognitive reading strategy mentions by author

Strategy and Source	Ahmadi,Ismail, &Abdullah	Armstrong & Lampi (2017)	Bauer (2014)	Braten & Stromso (2011)	Cakici (2017)	Gillis (2014)	Hebert, Bohaty & Nelson	Jake Follmer & Sperling	Jitendra, Burgess &Gajria	Khodabandehlou, et. al (2012)	MacMillan (2014)	Manarin (2012)	Nash-Ditzel (2010)	Roehling, et. al (2017)	Theriault, et. al (2018)
Understand/Set purpose, set goals		•	•									•	•		
Prior knowledge/Connect outside text	•	•	•	•	•	•		•		•	•		•		•
Preview/Survey/Skim		•			•			•			•				•
Scan/Info searching/Locating details		•			•										
Segmenting/Dividing text into chunks					•										
Determine what to read/not read		•													
Identify/Focus main idea/relevant info		•		•				•	•				•		•
Evaluate/Analyze ideas				•		•						•	•		
Monitor comprehension			•	•	•			•		•		•	•		
Make inferences						•		•				•	•		
Summarize, paraphrase	•			•				•	•	•	•	•	•	•	
Prediction										•		•	•		
Vizualize/Image	•											•	•		
Think aloud/Discuss		•		•		•				•			•		•
Identify/Analyze Text Structure				•									•	•	
Self-question/Questioning									•	•		•	•	•	
Reread/"Fix it"								•	•			•			
Use references (dictionary, Google)	•	•													•
Graphic organizers, concept mapping			•	•		•	•	•	•					•	
Pause or adjust reading pace								•		•	•				
Watch for signal words														•	
Text marking (a...,circle, highlight)	•							•							
Elaborate/Margin notes/Annotation				•			•								
Clarifying									•	•					
Synthesize from multiple sources				•						•		•			
Consider source value, bias, context		•		•											•
Connect ideas/back & forth in text		•	•	•					•			•			•
Use images, tables, diagrams		•				•		•							•
Guess meaning by context/form	•					•									
Use text structure	•						•								

Summary

Although decades of research and programming have been devoted to improving retention rates in higher education, there is much work remaining. The area of metacognitive skill development in postsecondary education is under-researched and holds promise for successfully improving student retention in all student groups, whether or not they are considered at-risk. Metacognitive reading strategies, which both increase a student's awareness of their learning and improve academic text comprehension, are a logical method to investigate in ongoing retention efforts and benefit all students in preparation for careers and lifelong learning.

Students in the study will be entering university from high school or a community college and will practice a variety of reading strategies through an in-class workshop provided by the campus Learning Specialist during their first or second semester. Researchers will track student enrollment and grade point averages for the subsequent two semesters and survey the participants to confirm if students utilized the strategies during the semesters following the intervention. The researchers will then investigate the correlation between reading strategy use and retention rates, while accounting for student use of other academic support services such as tutoring and supplemental instruction.

CHAPTER III:

METHODOLOGY

Overview of the Research Problem

Metacognitive reading is a crucial academic skill in higher education yet is typically absent in most college students (Cummings, 2015). Student retention is also an issue in higher education, for a variety of reasons (Hunsaker & Thomas, 2013). Insufficient reading skills and a lack of time to complete coursework are both frequently cited by students and faculty as contributors to student attrition (Carlston, 2011; Hutchens, 2016). Even students who attend high ranking public schools and perceived by their high school instructors to be prepared do not generally demonstrate adequate metacognition and reading abilities (Bauer, 2014). Despite the overall student need for reading skills and the effort to increase retention, metacognition and reading strategies are not commonly found in higher education courses or academic support programs (Ahuna, 2011).

Operationalization of Theoretical Constructs

This study consists of three constructs: the theoretical perspectives of Tinto's (1975, 1993, 1999, 2004) Student Integration Model, Flavell's (1979) Model of Cognitive Monitoring and Heider's (1958) Attribution Theory. The results from this study will contribute to the field of higher education by providing detailed information on the metacognitive reading habits of students and the potential role of these strategies in retention. While there is no shortage of studies on retention from financial aid, special populations, and campus involvement perspectives, there is a paucity of research investigating the potential of metacognitive reading strategies as a factor in higher education retention, despite both reading and metacognition having empirically established roles in the college learning process. The Metacognitive Awareness of

Reading Strategies Inventory (MARSI) will be employed to measure student use of metacognitive reading strategies.

Research Purpose and Questions

The purpose of this study is to examine the relationship between use of metacognitive reading strategies and retention rates in undergraduate university students. The questions this study seeks to answer are:

1. Is there a relationship between the level of use of metacognitive reading strategies and student retention in higher education?
2. Is there a difference in number of metacognitive reading strategies used based on subject area?
3. How do metacognitive reading strategies affect student perceptions of schoolwork?

Research Design

This study addresses the use of metacognitive reading strategies and the possible relationship to student retention in higher education. An explanatory sequential mixed methods design was used, involving collection of quantitative data regarding strategy use and retention rates and then explaining the quantitative results with in-depth qualitative data from interviews. In the first, quantitative phase of the study, MARSI data was collected from students in the sample, then archival retention data was collected through enrollment records at the end of the semester following the survey responses in order to assess whether student use of metacognitive reading strategies relates to retention in higher education. The second, qualitative phase was conducted as a follow-up to the quantitative measure, the MARSI survey, to help explain the quantitative results. In this exploratory follow-up, the research explored metacognitive strategy use through interviews.

Population and Sample

For this study, the population was first-year students entering directly from high school or from a community college to a small regional, public university in Southeast Texas.

The undergraduate population of the institution is 39% White/Caucasian (non-Hispanic), 41% Hispanic, 8% Black/African American, 7% Asian and the remaining 5% other race, race unidentified or non-resident alien. Undergraduates at the institution are 38% male and 62% female. In the 2018-19 academic year, the university had a total enrollment of 6,212 undergraduate students. 1,419 students entered as undergraduate transfers from mostly community colleges and occasionally from another university, while only 237 First-time freshmen enrolled. This is a reflection of the abundant and moderately priced community colleges in Southeast Texas with transfer agreements to several public universities.

Over the course of three semesters from Fall 2018 to Fall 2019, students from the First-Year Seminar (FYS) course were invited via email from their instructor to participate in the (MARSI) survey, titled "Academic Reading Habits Survey" and made available online through Qualtrics. The reading habits survey was worth 5 points as one of many options available for their campus resources Scavenger Hunt assignment and was not required, though it was one of few online options available on the Scavenger Hunt list.

Participant Selection

All FYS students were invited to participate in an individual interview to offer feedback regarding their use of reading strategies and personal beliefs and motivations concerning use of the strategies. Invitations were extended by a promo email through the FYS course professors. Participants were offered the choice of a $5 Amazon, Target, or

Starbucks e-card as a token of thanks for participating. Interviews took place by video chat, using Blackboard Collaborate in the initial semesters and Zoom video conferencing in the final semester of the project.

Instrumentation

This study utilized the MARSI to measure student use of metacognitive reading strategies. The MARSI was developed by Mokhtari and Reichard (2002) as a 30-item inventory to assess students' self-reported use of metacognitive reading strategies related to academic reading. The survey was validated using exploratory factor analysis of 60 items designed on both a review of literature identifying strategies employed by skilled readers (Pearson, Roehler, Dole, & Duffy, 1992; Pressley & Afflerbach, 1995) as well as expert input. The number of survey items was later reduced to 30 and readministered to a second group of students. The MARSI has adequate reliability and validity: the overall reliability is 0.89, and reliability of its 3 subscales as follows: .92 global reading, .79 problem solving, and .87 support reading strategies. Validity was established by the subject experts and through comparison with students' self-reported reading ability. The inventory yields an overall score and scores on three subscales: global reading strategies, problem solving strategies, and support strategies. The MARSI was developed over the course of 3 years, 1998 - 2000 (Sheorey & Mokhtari, 2001). The developers of this assessment report that it is also suitable for use with adults, although the instrument was developed using students in grades 6 to 12 (Mokhtari & Reichard, 2002).

Students read each of the 30 "I" statement strategy items on the MARSI and respond using a 5-point Likert-type scale, where a score of 1 indicates that the student *never/almost never* uses this particular strategy and a score of 5 indicates that the student *always/almost always* uses this strategy when reading academic text. The MARSI results in four scores, including a total score and three strategy subscales. The total score uses the average of the student responses to each statement. An average of 0.0-2.4 is considered low use of strategies, 2.5-3.4 medium use of strategies, and 3.5-5.0 high use of strategies. The Global Reading Strategies subscale includes 13 strategies such as determining a purpose for reading, previewing the text to note length and format, or making and confirming predictions about content throughout reading. The Problem Solving Strategies subscale includes eight strategies such as adjusting reading speed according to the text and visualizing information to aid in comprehension and memory. The Support Reading Strategies subscale includes nine strategies such as creating questions to find answers to within the reading, marking text and adding margin notes, and writing a summary of material after reading. Paper-based survey administration averages 10 minutes (Mokhtari & Reichard, 2002). At the end of the MARSI, students were also asked to identify the subject areas (i.e. chemistry, history, sociology, math) in which they have used the metacognitive reading strategies. A list of subject areas common to students at the campus was provided but students also had the option to type in any subject areas that applied to them but were not in the list.

Data Collection Procedures

From mid-September to early December each of the three semesters of the study, all FYS students had access to the Academic Reading Habits survey, composed of the MARSI and the added item that asked participants to identify disciplines and courses they used strategies in. The last item on the survey page was the question, “Do you need to receive credit for this survey for the First Year Seminar (Learning Frameworks- Psych 1100) course?” with options of “yes” and “no” radio buttons. A “yes” response led the participant to a final item where they entered their name, student ID # and email address. From time to time, new responses were exported to a CSV file and saved in Excel format. Each survey duration was verified as being at least three minutes and duplicate responses from a participant were minimized to one. Mail merge was then used to send a form email with send date, participant's full name, and survey completion date to the email address provided by the participant in the name/ID/email item. Participants were instructed to print the confirmation email and attach it to their Scavenger Hunt form before turning into their FYS professor for credit. The reading habits survey was worth 5 points as one of many options available for the assignment. During the following semester, the research assistant checked participant enrollment records for retention rates and other enrollment information such as entry from a high school or community college, student's major and Cum. GPA. The research assistant removed participant identifiers such as name, student ID and email address, then scrambled the order of participants before returning the data set. The researcher then compared retention to strategy use for possible correlation.

Interviews gathered feedback via open-ended questions regarding how often students read for courses, how they chose what to read or not read, whether or not participants were aware of metacognitive reading strategies, if they used any of the reading strategies, which strategies (if any) were used, how many and which type of disciplines and classes they used the strategies in, and their perception of the effect the strategies had on their academic experience and success. All interviews were video recorded for later transcription and analysis.

Data Analysis

Quantitative

To address research question one, "Is there a relationship between use of metacognitive reading strategies and student retention in higher education?", a measure of association was done with a 2 x 3 contingency table using Chi-Square analysis, variables represented by "Low", "Medium" and "High" use of strategies according to the scale provided by the MARSI survey and “Retained” or “Not Retained”. However, there were only five participants total who were not retained one semester after completing the survey, one in the “Low” group, four in the “Medium” group and zero in the “High” group, which is lower than the expected minimum of five for each variable entered for a Chi square.

Next, a measure of association was done with a 2 x 2 contingency table using Fisher & Irwin’s exact test with the overall reading strategies score coded as “3.0 and below Overall Strategy Use” or “Above 3.0 Overall Strategy Use” and their retention coded “Retained” or “Not Retained”. This cutoff was based on the researcher’s observation that the four participants in the “Medium” category for strategy use were on the lower side of the “Medium” range, with none having an overall strategy use average above 3.0. The Fisher& Irwin method (often called a “Fisher Exact Test”) is a suitable alternative to a Chi-Square in situations where one of two variables in a column has a value of zero (Fleiss, Levin, & Paik, 2003). The Fisher exact test was also used to examine the existence or strength of the relationship between participant subgroups’ use of strategies and their retention; these groups included First Year students, First Generation students, and males, all of whom have been identified as populations at higher risk for attrition (Atherton, 2014; NCES, 2019).

Research question two, “Is there a difference in number of metacognitive reading strategies used based on subject area?” was examined using descriptive statistics. Information regarding strategy use in various subject areas was gathered through a self-report item added to the end of the MARSI survey, which provided participants with a comprehensive list of course subjects and asked students to identify in which course subjects they had used reading strategies in by checking the box. Students had two “other” options to write in any discipline that was not provided in the checkbox list. The

117 participants reported strategy use in specific course fields, which were later aggregated into five overall disciplines by the researcher. Discipline responses were aggregated and grouped by themes into the five larger fields of Business, Education, STEM, Humanities, and Language/Literature/ Communication (LLC). The researcher totaled the number of disciplines each student reporting using strategies in and found overall average number of disciplines for the overall group, as well as for each sub-group ("High", "Medium" and "Low" strategy users by the MARSI scale).

Qualitative

To answer research question three, "How do metacognitive reading strategies affect student perceptions of schoolwork?" structured interviews were conducted with six participants. Structured interviews were selected to ensure focus and maintain consistency across multiple interviews. Student responses to interview questions were transcribed and coded by common descriptions and themes using corpus linguistics to note word frequency as well as context. The text from each student's spoken words was uploaded separately to wordart.com, a word cloud generator that includes a word count feature. This word count feature generates a downloadable spreadsheet of the corpus (body of words) and count of word occurrence for each student interviewed. The word count feature was utilized as a basic alternative to more complicated corpus analysis software packages, which typically include much more detailed linguistic information than was necessary for this study and could have clouded the researcher's contextual judgment. Interview questions to generate discussion included whether or not participants personally used metacognitive reading strategies, which strategies they used, how often they used them, which courses they used them for, and if/how they felt using the strategies affected their academics. A full list of interview questions is provided in Appendix F.

After transcription, the researcher made a copy of each transcript and removed the interviewer's words and any phrases irrelevant to the strategy discussion, such as the introduction between researcher and participant and the discussion of how to send the gift card to the participant, as well as obvious filler words such as "um." The researcher then imported the participant's body of text into the word cloud generator available at www.wordart.com, checking the "remove common words" option to avoid non-function words like articles and high-frequency prepositions (in, on, etc.) and the "stemming" option so that all closely related forms of a word (i.e. present, presents, presented) would be counted as the same functional word. The researcher then downloaded the automatically generated word count grid as a spreadsheet. As the interview questions focused on two overarching themes of reading strategy use and reason for the strategy choices, two columns labeled "Actions" and "Reasoning"

The researcher then made use of the "Find and Replace" function in MS Word to look for each count word in the corpus spreadsheet and check the context. If the context was completely unrelated to the topic of the study, the word's count was reduced by 1 for each unrelated use. If the context was related to the study, the researcher determined if each use of the word was related to an action or strategy the student uses, or rather related to the decision making/metacognitive process. For each valid occurrence, the researcher entered the word and the number of applicable uses under the "Metacognitive Actions" column or the "Metacognitive Reasoning" column with a notation about phrasing. An example is provided in Figure 3.1.

Word	Raw total	invalid	Valid	Notes on use		***M. Actions***		***M. Reasoning***	
Time	3	1	2	This one time, (ex.)		Time (write X times)	1	Time (timeline, history)	1

Figure 3.1 Header line from corpus analysis spreadsheet

When each interviewee's word count sorting was complete, the researcher compiled an aggregate list by combining the actions/strategies and making choices/metacognition word and count columns from all interviewees' tabs into one tab, aligning the columns. The researcher then performed an A-Z data sort within each column (Metacognitive Actions and Metacognitive Reasoning) so that repeating words and stemmed words with the same meaning lined up and could be combined into a grand total frequency by word and context. The researcher was then able to look for and label sub-themes among the aggregated words, with the prevalence of the sub-themes highlighted by the frequency count of words forming the particular sub-theme.

Counting as a method in qualitative analysis has been established in other studies, and is particularly suited to qualitative research that is designed not to generate a theory but to test it. According to Hannah and Lautsch (2011), "such research is likely to place a higher priority on statistical means of assessing validity and generalizability, and as such, the use of counting will be more often simply a requirement" (p. 15). Corroborative counting is one of four qualitative types of counting described by Hannah and Lautsch (2011), and is born out of a conventional triangulation approach involving a combination of qualitative and quantitative methods (Jick, 1979). This approach uses counting to verify the conclusions reached by a purely qualitative analysis of a data set. Maguire, Hardy, and Lawrence's 2004 article studying the legitimacy of actors in an institutional context examined how two key "institutional entrepreneurs" had been influential in bringing about institutional change. Qualitatively, they analyzed staff interviews and spotted two actors who seemed to be identified by colleagues as instruments of change.

They corroborated their decision to focus on those two actors by counting the number of "legitimacy-conferring characteristics" ascribed to each actor by others in interviews (Hannah & Lautsch, 2011).

Qualitative Validity

Qualitative validity was ensured through a combination of member checking, triangulation and peer review (Creswell & Miller, 2000). Member checking involved sending a copy of the interview transcript to each participant with an invitation to check for accuracy and respond with notes of omissions or errors. No responses from participants were received regarding necessary additions or corrections to transcripts.

Triangulation included comparing the emerging qualitative themes from the corpus analysis against sources on the habits and strategies of successful adult academic readers and related research on the metacognition of reading. Specific strategies mentioned by students were also compared to the survey items on the MARSI, where each item was a specific approach or strategy for reading. Triangulation is not only a validity check, but in a sense, a reality check, as empirical data from surveys or archives is integrated with constructivist information from interviews and observations (Olsen, 2004). Olsen posits that this triangular merging of human perceptions and factual counts will better reflect the reality of lived experience and the world in which it occurs than a singular method could. Olsen also puts forth the idea that in identifying patterns of variables in related quantitative and qualitative research, we are inspired to explore further to find causes, thus generating new ideas, new questions and perhaps a new round of research.

Peer review is a process in which fellow researchers trained in qualitative methods provide a fresh perspective by reviewing and coding themes on unmarked copies of study transcripts (Creswell & Miller, 2000). In this study, full interview transcripts were made available to peer reviewers, two doctoral students with training and experience in coding for themes, who separately read and coded for themes. The peer reviewers were first informed of the larger scope of the study, which was to investigate a possible relationship between student use of metacognitive strategies and retention. The researcher also explained that interviews were conducted to learn about two things: what students did when they were reading and why they did or didn't do those things. The peer reviewers were therefore advised to read the interview transcripts with the goal of identifying any kind of strategies or approaches students mentioned using for reading purposes, and identifying any motivations or influencing factors students mentioned when describing why they did what they did.

The peer reviewers used a traditional approach to coding, in which they marked the text for words and phrases of significance and annotated the text according to themes they saw emerging from patterns. One peer reviewer chose to color-code their marking and notations. The researcher also coded a printed transcript for themes using notation and color-coding, for the purpose of comparing to the peer reviewers' coding, as well as for comparison to the corpus analysis spreadsheet from the word count. Overlapping themes were found among all coded transcripts and between the transcripts and the corpus analysis, yet the corpus analysis method yielded richer and more specific descriptive theming. Four out of six interviewees had not participated in the MARSI survey portion of the study, yet triangulation revealed significant overlap in themes, suggesting that the students were aware of the ways they strategize when reading despite not necessarily having been exposed to terminology to describe those strategies.

Privacy and Ethical Considerations

Before collecting data, permission was obtained from CPHS. All students in the FYS courses who participated in the MARSI survey indicated agreement to a consent statement included as the first survey question. The researcher has FERPA compliant access to the institution's student enrollment and GPA data as an aspect of employment.

All student data from surveys, interviews and enrollment records is kept in limited-access digital files requiring a password or share permissions or physical files kept under lock and key, only accessible to the researcher and assistant.

Research Design Limitations

There are a few limitations to the research design. The first is that self-report measures can be biased. In this case, the bias may come from a student's inaccurate perception of how often they use various reading strategies, or over-reporting their use of strategies in an effort to please or avoid displeasing the researcher. A second limitation is that because many community college students take a similar course to FYS and receive credit for the requirement prior to transferring into the university, the study sample is very likely to be disproportionately freshmen to the overall first-year-in-university population. A final limitation to consider is the potential for confounding factors, such as students using other academic support services during their first year. It is also plausible that students who choose to use metacognitive reading strategies already tend to have good academic habits in general, making it difficult to accurately quantify the effects of the reading strategies in particular.

Conclusion

Student retention continues to be an issue in higher education institutions in the U.S. and is likely to continue proportionately with efforts to diversify and increase access to post-secondary education. While many at-risk groups make up an increasingly larger segment of the overall higher education student population and these students may have particular needs requiring multiple types of support, a skill deficit that is common to most students in the higher education population at large is the use of metacognitive reading strategies to complete coursework. As reading constitutes such a major part of knowledge transfer in higher education, remediating this skill across the curriculum with all students could prove key to the larger student retention improvement effort. Aside from the basic potential effect of improving grades, it is also possible that the associated time management benefit of having more effective, efficient learning strategies could indirectly be a major contributor to retention, particularly for non-traditional students who often drop out due to time constraints and feeling overwhelmed by schoolwork. Knowing if students who use metacognitive reading strategies have higher retention could inform better curricular decisions and practices in higher education.

CHAPTER IV:

RESULTS

Participant Demographics

Table 4.1

Demographics of MARSI survey participants

Factor	Total Sample
Gender	
n	117
% Female	56
% Male	44
Classification	
n	117
% 1st Semester Freshman (fewer than 12 credits)	40
% 2nd Semester Freshman (fewer than 12 credits)	1
% 1st Semester Community College Transfer- Freshman	9
% 1st Semester Community College Transfer- Sophomore +	15
% 1st Semester University Transfer- Freshman	1
% 1st Semester University Transfer- Sophomore +	7
% Sophomore	14
% Junior	8
% Senior	7
First-Generation Status	
n	117
% First Generation	39
% Non-First Generation	61
College of Study	
n	117
% Business	13
% Education	12
% Humanities & Human Sciences (HSH)	26
% Science & Engineering	44
% Undecided	1

Of the 117 survey participants from FYS courses, 51 were male and 66 were female. This means 44% of the sample were male and 56% female, which is somewhat different than the most recent demographic data from the institution, showing an academic year 2018-19 undergraduate population that was 38% male and 62% female. This difference is likely related to the introduction of the Mechanical Engineering major in Fall 2018, which has attracted more male students and increased the ratio of males to females in the Fall 2019 freshman and sophomore classes. The majority of the group were first semester freshmen with no or few college credits (less than 12 earned prior to enrollment at the institution). Many participants were first semester transfers; 9% were first semester community college transfers classified as freshmen (under 30 credits), 15% were first semester community college transfers with 30 or more credits, one (1%) was a first semester university transfer still classified as a freshman (under 30 credits) and 7% were first semester university transfers with 30 or more credits. The remaining 28% were continuing sophomores, juniors, or seniors.

First-generation students were well-represented in the group, at 39%, which is somewhat lower than the campus average of 55%. This may reflect the fact that first-generation students are very likely to first attend a local community college (Lee, Sax, Kim, & Hagedorn, 2016). Another possible reason is that many students take a course equivalent to Learning Frameworks in community college before transferring. Ethnicity data for the group was not available.

All four colleges were represented in the sample, as follows: 13% in Business, 12% in Education, 26% in Humanities & Human Science, and 49% in Science & Engineering, with one student Undecided. This would seem to be rather different than the general undergraduate makeup of the institution as of Fall 2019, which was 27% Business, 16% Education, 29% HSH and 27% Science & Engineering and 1% Undecided. It is not surprising that the numbers shift toward more Science & Engineering majors in the study sample due to a new, well-publicized Mechanical Engineering program in Fall 2018 with only freshmen and sophomores so far.

Research Question One

Is there a relationship between use of metacognitive reading strategies and student retention in higher education?

The null hypothesis “There is no relationship between student use of metacognitive reading strategies and retention in higher education” is invalid. Using Chi-Square analysis, variables represented by “Low”, “Medium” and “High” use of strategies according to the scale provided by the MARSI survey and “Retained” or “Not Retained”, results were not significant, at .421. However, there were only five participants total who were not retained one semester after completing the survey, one in the “Low” group, four in the “Medium” group and zero in the “High” group, which is lower than the expected minimum of five for each variable entered.

Table 4.2

Retention and high, medium, and low use of strategies chi square

		High	Medium	Low	Total
Retention	Not retained	0	4	1	5
	Retained	29	65	18	112
Total		29	69	19	117

Table 4.3

Chi square tests of significance for retention and level of strategy use

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.732[a]	2	.421
Likelihood Ratio	2.929	2	.231
Linear-by-Linear Association	1.047	1	.306
N of Valid Cases	117		

Next, a measure of association was done with a 2 x 2 contingency table using Fisher & Irwin's exact test with the overall reading strategies score coded as "3.0 and below Overall Strategy Use" or "Above 3.0 Overall Strategy Use" and their retention coded "Retained" or "Not Retained". This cutoff was based on the researcher's observation that the four participants in the "Medium" category for strategy use were on the lower side of the "Medium" range, with none having an overall strategy use average above 3.0. The Fisher & Irwin method is a suitable alternative to a Chi-Square in situations where one of two variables in a column has a value of zero (Fleiss, Levin, & Paik, 2003).

A total of 117 students were recruited to the study. All students completed the MARSI survey and obtained averages of overall metacognitive strategy use on a scale of 1.0 - 5.0. Of those students recruited who indicated an average of overall metacognitive strategy use at or below 3.0, 42 (89.4%) were retained the following semester. Of those students recruited who indicated an average of overall metacognitive strategy use above 3.0, 70 (100%) were retained the following semester. There was a statistically significant association between overall level of strategy use at or above a 3.0 average and student retention in their higher educational institution as assessed by Fisher's exact test, $p = .01$.

Table 4.4

Relationship between strategy use and retention

Strategy Use	p value
Overall Strategy Use Above 3.0 Average Use	.001
Global Strategy Use Above 3.0 Average Use	.014
Problem Solving Strategy Use Above 3.0 Average Use	.039
Support Strategy Use Above 3.0 Average Use	.321*
Support Strategy Use Above 2.67 Average Use	.023

*p > .05

Table 4.5

Overall strategy use above 3.0

	Results		
	Retained	Not Retained	Marginal Row Totals
3.0 and Below Overall Strategy Use *	42	5	47
Above 3.0 Overall Strategy Use	70	0	70
Marginal Column Totals	112	5	117 (Grand Total)
p= .001			

Table 4.6

Descriptive statistics on average use of strategies overall and by college

	Average of Strategy Use				
	Overall Group	Business	Education	HSH	Science & Eng
Overall	3.10	2.97	3.43	3.04	3.11
Global	3.12	2.99	3.35	3.02	3.15
Problem Solving	3.54	3.51	3.83	3.46	3.52
Support	2.67	2.41	3.16	2.63	2.65

Notable patterns appeared in the strategies reported as used by students. For example, Global Strategies, which are those most likely to be taught in K-12 and are generally applicable to almost any discipline or reading format (Mokhtari & Reichard, 2002), were used at a Medium level of 3.12 by the overall study sample. This group of strategies, which is the largest, includes 13 strategies: 1) having a purpose in mind when reading, 2) thinking about prior knowledge, 3) previewing the text, 4) checking if the content of a text fits the reader's purpose, 5) surveying the length and organization of the text, 6) reading relevant information and ignoring the irrelevant, 7) using graphics to help comprehension, 8) using context clues to understand new words and ideas, 9) noting the font to find key ideas, 10) critically analyzing information, 11) checking their understanding of conflicting information, 12) trying to guess the text topic before advancing, and 13) checking if their guess was correct. Certain strategies stood out as being used considerably more than others. For example, 66 out of the 117 participants indicated that they have a purpose in mind when they read Always/Almost Always or Usually (5 and 4 on the measure's Likert scale), 68 indicated using prior knowledge while reading Always/Almost Always or Usually, 66 reported Always/Almost Always or Usually using context clues, and 58 marked that they Always/Almost Always or Usually check their understanding of conflicting information. By the same token, some strategies stood out as being used considerably less than others in the same subscale. The average use of Surveying the Length and Organization of a Text Before Reading barely qualified for Medium level use at a 2.68, with 61 participants indicating that they Never/Almost Never or Only Occasionally (1 and 2 respectively on the study's Likert Scale) did this. Utilizing the same measures, Using Graphics (2.8 average and 52 participants) and Noting Font Type for Key Ideas (2.79 and 50) were also underused. Finally, 53 students marked Never/Almost Never or Only Occasionally for Guessing the Next Topic While Reading (average of 2.8 on provided Likert scale), but even less actually Checked If Their Guess Was Correct, with 57 Never/Almost Never or Only Occasionally following through on the strategy for an average of 2.57. There was a statistically significant association between Global Strategy use at or above a 3.0 average and student retention in their higher educational institution as assessed by Fisher's exact test, $p = .014$.

Table 4.7

Global Strategy use above 3.0

	Results		
	Retained	Not Retained	Marginal Row Totals
3.0 and Below Global Strategy Use	46	5	51
Above 3.0 Global Strategy Use	66	0	66
Marginal Column Totals	112	5	117 (Grand Total)
p value= .014			

Problem Solving strategies were by far the most consistently used of the subscales. This group includes eight strategies related to addressing issues when reading breaks down: 1) reading slowly and carefully when having difficulty, 2) getting back on track when focus is lost, 3) adjusting speed to fit the difficulty of a task, 4) paying closer attention when a text becomes difficult, 5) stopping from time to time to think over the text, 6) visualizing to understand what is being read, 7) rereading a section when facing difficulty, and 8) guessing the meaning of new words. Students in the study reported routinely getting back on track when distracted while reading, with an average of 4.13 on the Likert scale, and rereading difficult items, at an average of 4.09. Students also mentioned regularly adjusting their reading speed (3.48), visualizing to understand (3.56) and paying more attention when having difficulty comprehending (3.94). Least utilized was Stopping and Thinking Things Over, reported at only 2.75. Problem Solving strategies as a subgroup was also statistically significant to student retention, as assessed by Fisher's exact test, $p = .040$.

Table 4.8

Problem Solving Strategy use above 3.0

Results			
	Retained	Not Retained	Marginal Row Totals
3.0 and Below Problem Solving Strategy Use	18	3	21
Above 3.0 Problem Solving Strategy Use	94	2	96
Marginal Column Totals	112	5	117 (Grand Total)
p = .040			

Support Strategies were used far less frequently than the other subscales, at an average of only 2.67. This group includes nine strategies, all of which involve practical supports that facilitate reading tasks: 1) taking notes from reading, 2) reading aloud, 3) summarizing a text, 4) discussing what they read with others, 5) marking text (underlining or circling key info), 6) using reference materials to look up information related to the reading, 7) paraphrasing text to better understand, 8) finding relationships between ideas, and 9) asking themselves questions to find answers to in the text. Students used many of these strategies less than half the time, below a 2.5 average on the Likert scale of frequency, namely Discussing with Others, Using Outside Reference Materials and Asking Themselves Questions to Locate Answers in the Text. In fact, 24, 23, and 26 students respectively reported Never/Almost Never using these three strategies. Support strategies at a level of use at or below 3.0 were not statistically significant, as assessed by Fisher's exact test, p =.321. The researcher assessed Support Strategy use at lower levels, recognizing that this category of strategies was far less utilized in general compared to other categories, and found that there was a statistically significant association between level of Support Strategy use at or above a 2.67 average and student retention, as assessed by Fisher's exact test, p = .023.

Table 4.9

Support Strategy use above 3.0

	Results		
	Retained	Not Retained	Marginal Row Totals
3.0 and Below Support Strategy Use	80	5	85
Above 3.0 Support Strategy Use	32	0	32
Marginal Column Totals	112	5	117 (Grand Total)
p= .321			

Table 4.10

Support Strategy use of 2.67 And above

	Results		
	Retained	Not Retained	Marginal Row Totals
Below 2.67 Support Strategy Use	51	5	55
2.67 or Above Strategy Use	61	0	61
Marginal Column Totals	112	5	117 (Grand Total)
p= .023			

Research Question Two

Is there a difference in number of metacognitive reading strategies used based on subject area?

This question was addressed through a self-report item added to the end of the MARSI survey, which provided participants with a comprehensive list of disciplines and asked students to identify which disciplines or course types they used reading strategies in by checking the box. Students had two "other" options to write in any discipline that was not provided in the checkbox list. The 117 participants reported strategy use in specific course fields, which were later aggregated into five overall disciplines by the researcher. Student responses on strategy use ranged from zero to all five disciplines each, with an overall average of 2.6 disciplines in which strategies were used.

The student discipline responses were aggregated and grouped by themes into the five larger fields of Business, Education, Science/Technology/Engineering/Math (STEM), Humanities, and Language/Literature/ Communication (LLC). Both Humanities and LLC were heavily reported as fields in which reading strategies were used, with 42% and 22% of student mentions respectively. This was not unexpected, as these are traditionally "wordy" disciplines with extensive reading of multiple genres required. STEM was also heavily reported for strategy use, however, with 27% of students mentioning STEM discipline courses, including Biology, Chemistry, Math, Physics, Nursing, Engineering, Computer Science/Engineering/IT, and Environmental Science. Education as a discipline made of 3% of responses and Business 4%. Courses in these disciplines are typically taken only by students in those degree programs, whereas as students take at least one of each of the other disciplines as part of their state core requirements, so this disproportion is partially explained by the core curriculum.

Table 4.11

Disciplines and strategy use by college

	Measure of disciplinary use
Reported Disciplines	% of total mentions
% LLC	22
% Humanities	42
% STEM & Health	27
% Business	4
% Education	3
	Average Number of Disciplines Reported
Overall Group	2.60
Business	2.53
Education	3.00
HSH	2.37
Science & Engineering	2.56

With higher overall strategy use, the average of disciplines in which strategies were used also increased. For students who scored "Low" on the MARSI scale for overall strategy use, the average number of disciplines they used strategies in was only 1.9. For students in the "Medium" range of overall strategies, the average number of disciplines strategies were used in rose to 2.6, and for the "High" group, 2.9. Strategy use levels varied in other ways, mainly the student's college of study.

Education majors showed the most consistent use of reading strategies overall at an average of 3.43 on the Likert scale, but particularly in the Support strategies subscale, at 3.16, compared to 2.97 for Business, 3.04 for HSH and 3.11 for Science and Engineering. Certain strategies were particularly utilized or underutilized by students of different colleges. For example, HSH students seem to be particularly consistent at rereading a section when they find it difficult, at an average of 4.23 on the Likert scale. Business students were most likely to employ their prior knowledge to the text they were reading, with an average of 4.0, and Education majors were the most likely to use context clues consistently, at an average of 4.0. Business majors were the least likely to use graphics to help them understand a text, at 2.13, or to try to guess the topic of the text before reading, at 2.27. They were also the least likely to take notes while reading (2.2), summarize what they've read (2.13) or find relationships between ideas (2.2). Science and Engineering students were the least likely to read aloud to work out the meaning of a text, at 2.91, while HSH students were least likely to discuss what they read with others, at 2.1.

Research Question Three

How do metacognitive reading strategies affect student perceptions of schoolwork?

Interviews were conducted with six current undergraduate students from the study sample. Interviews were transcribed and the text from each student's spoken words, loaded separately onto wordart.com, a word cloud generator that includes a word count feature. This word count feature was utilized to download a spreadsheet of the corpus (body of words) and count of word occurrence for each student interviewed.

The two overarching themes of the survey were "Metacognitive Actions", or actions and strategies that students mentioned using to accomplish their reading, and "Metacognitive Reasoning", or the motivations and factors students the students reported were behind their choice of actions and strategies. With these two overarching themes in mind, the corpora of each interview were analyzed in its spoken context by examining the transcript, and words with their associated contextual count were placed into the Metacognitive Actions or Metacognitive Reasons section of the student's corpus spreadsheet. Once corpora analysis from all student interviews was completed, words were aggregated to a single list and counts of stemmed and repeating words totaled. More specific themes emerged through analysis of the aggregate corpus of student responses.

Within the Metacognitive Actions category, two subcategories emerged: Strategies and Approaches. Under the Strategies subcategory, two overall types of strategies emerged: Chunking, which included sectioning text and dividing time into blocks of work and breaks, and Interacting with Text, which contained multiple types of text interaction like text marking, pre-reading activities, activities during reading, and post-reading activities, what students look for while reading, making connections and finding relationships among ideas, writing-related strategies, and converting text info into another form. Under the Approaches subcategory, several elements emerged: where and when to read, how to choose what to read/not read, text types and formats, retaining and recalling information, and expressions of reading habits. All students described multiple types of reading sources (text types): textbooks, social media, novels, journal articles, PDF and online formats, PowerPoints and stories.

Table 4.12

Metacognitive actions emerging interview themes

Themes and Subthemes	
General Approaches	Specific Strategies
Choosing what to read/not read	Chunking
Where and when to read	Sections of text
Text types and formats	Blocks of time and breaks
Goals for information	Interacting with Text
Habits in place	Pre-reading activities
	Looking for signals
	Text marking
	Finding connections/relationships
	Writing-based strategies
	Post-reading activities
	Converting information to another form

All six students mentioned at least some habits associated with successful metacognitive reading strategy use and with student academic success. First, each student identified multiple actions that they take when reading for academic purposes. These actions ranged in type and time in which they were employed. Students mentioned a wide variety of signals they looked for while reading: titles, headings, bold and italicized words, key words and phrases, dialogues, definitions, colored boxes, theorems, formulas and even foreshadowing. Strategies employed at specific times were also mentioned, such as using the syllabus to help determine what would be important to read and what to look for in the text, and using the summary or key points in the back of a textbook chapter as a preview of the chapter content. During reading, students mentioned picking out key ideas, skimming and looking for the gist, skipping over material they didn't think was useful or relevant, scanning to look for specifics, going back and forth within a text or rereading to clarify meaning, going back to their notes or referencing another source. Various types of text marking were shared, from highlighting and underlining in different colors to using asterisks and arrows. Strategies that specifically involved writing included taking down notes separately or annotating margins, summarizing the text in their own words, rewriting notes to strengthen memory and using sticky notes. Some students specifically mentioned their process of making connections between ideas and finding relationships between texts or concepts. Students often mentioned that post-reading, they review their notes from the texts, rework sample problems and study information gleaned from reading. Some also mentioned converting that information into more usable forms or study aids, like note cards, charts, and a "cheat sheet" of talking points to use in class discussion. All students describe actions in reading that are elements of metacognition, as well as key components of the steps in the Study Cycle, the cyclical, multi-stage process of study which includes Previewing, Lecture, Reviewing and Studying as major tasks, with a variety of effective reading, note-taking and study strategies as subtasks within (Christ, 1997) .

Table 4.13

Metacognitive reasoning emerging interview themes

Themes and Subthemes	
Benefits	External Factors
General benefits	Professor
Time/Time management/Efficiency	Academic requirements
World/Society/Perspective	Practical considerations
Internal Factors	Disciplines
Interest/Personal purpose	Disciplines/courses/subjects
Learning/academic goals	

Multiple factors went into the reasoning that informed each student's approach and ultimately their choices of strategy. Approaches mentioned included their purpose for reading such as if they knew the information would be on a quiz or exam, as well as the length of the reading and how much time they had available. All participants mentioned some aspects of when and where they read, such as their home office, a quiet space near their classes, or anywhere they wouldn't be interrupted. Others mentioned that they tend to read between classes to make use of available time; some specified the act of shutting the door or sitting as the beginning of their reading process. Samuel mentioned that the purpose for the information he's reading is a determiner of how much he reads and what he's looking for:

> When my role as a group participant didn't really require me to write about what we read, like when I'm the journalist [of the group] and my role is to write about what other people said, then I don't read all of the reading because I need more of the overall idea.

Myles mentioned the formatting that is typical of his course texts as a way to find the information he is looking for:

> Most of my reading is math books and stuff, so when I approach it, I'm looking for a keyword or a formula and typically those are in like a little blue box or they're written in yellow, so I just turn the page, look for a blue box, yellow, or keyword, move on the next thing to find it, ...stop, read what I need to get and get out.

Daniel describes his varying actions with different text types:

> [In an English class] I normally just take notes, write main ideas, things I don't understand, why I don't understand them, things that I think are important that I need to remember, things that'll help me, clues to foreshadowing..., and I can relate that once I hit those points. In math-related fields, I might underline a theorem, highlight it, make sure I write it down a bunch of times and try to memorize it, try to derive it.

Belinda shared a simple but effective strategy of reading the stuff she doesn't want to read first, and demonstrated a chart system she uses, essentially a graphic organizer for information from a text:

> I started using this chart system that a friend showed me... You fill in what the topics are, and comments or points from the authors and there's a spot for jargon. So, this was three different authors and I wrote the topics and what they said into the blocks on the chart (points to each section as she's talking).

Amber mentions multiple ways of interacting with the text:

> I highlight and make notes and mark it up, in the margins or certain lines or passages that are important. I like asterisks and sometimes I make notes to myself to refer to something or go back and read something. I also have a spiral notebook for each class where I take notes if I need to. I use different colors to highlight what I think is important and then a different color for what the professor mentions.

Myles describes another strategy, moving back and forth in the text:

> I'll start from a section, from the beginning of a section, and if I don't find what I need I will go to the beginning of the chapter, look for it there, and if I can't find it there, to the back of the book.

Ashley has discovered that blocking out time for reading and time for short breaks is an effective strategy for getting more from a reading:

> If I stop and take breaks, not long but 5, 10, 15 minutes during it, I do a lot better, than just trying to do it straight for 2 hours. I've noticed that if I go like 30 minutes, and then take like a 5, 10-minute break, I seem to retain the information better.

Within the Metacognitive Reasoning category, four subcategories emerged: External Factors, Internal Factors, Disciplines and Benefits. External Factors ranged from professors to academic requirements to practical considerations, which included things like whether or not a book needed to be mark-free because it was rented or how long a reading was. Academic requirements mentioned included things like direction from the syllabus on what was important, if the reading provided information that would be used on a quiz, final exam, in an essay or for a project, or even if the reading was assigned or not. Amber gives an example, "When I write papers or work on a project, I reference the text as I need to." Experience with a professor was mentioned as a factor, specifically if a professor put in effort and provided the students with sufficient information, both cited as reasons they would be willing to read further. Myles has insight on this phenomenon:

> I don't really know if it's quite so much the subject, as it is the professor. If I feel my professor is really good and really strong, I will actually read more. Now, if I feel like my professor is just not giving me the information I need, I guess, logically, it doesn't make sense but I actually read less.

Internal Factors included academic and learning goals, such as gaining knowledge, understanding cultural references, understanding and remembering information, learning what words and phrases mean, and focus on personal educational objectives. Personal interests and purposes also played a major role as an internal factor in strategy choices. It is noteworthy that although none of the interview questions asked about student interest in topics and if this affected the way they read, five out of six participants spontaneously mentioned that they will read more, beyond what's required or assigned, possibly take extra notes, or reread an assigned piece if the topic was of personal interest or was related to personal or professional goals. Amber shared:

> I use notes when I write papers or work on a project, I reference the text as I need to. If it’s education, I like it and find it interesting, that’s why I went into education, so I want to read and learn about it and the notes are sometimes for future.

Ashley had similar habits regarding subjects of interest:

> Math is just, you have to know everything. English, it depends again on if it's something I'm interested in. I'm taking a Child Psych class, it was really interesting to me, so I read a lot more, it depends if it's interesting or something I want to know more about.

Belinda was clear about her willingness to put extra effort into something that interests her:

> If I’m interested in it or it matters to me. Like if it’s about the environment, I’ll read more carefully and do more, but if it’s an article that says that kids today aren’t interested in democracy, I’m not gonna be interested.

Daniel described reading beyond the assignment:

> If I don't need to [read it], I'll skip it, but if I find it knowledgeable just for myself, I'll go ahead and read it anyway. I feel like if I can get the grade, that's great, but if I still have that thirst for knowledge for it, I'll read it again anyway. If I don't have anything to gain from it at all, then what is really the point?

Initially, Myles described only the circumstance in which he would skip over or skim sections, if he were pressed for time. When asked a follow-up question on if there were circumstances in which he wouldn’t ever just skim but read for details, he replied, “If I'm really lost, or I'm really intrigued.” This finding has many implications, as a well-established correlation exists between reader interest and reading comprehension (Soemer & Schiefele, 2019).

One major difference in the students’ perspectives was whether or not the discipline or course subject played a role in how they approached a reading. Belinda indicated it wasn’t a factor for her at all, “It’s not really different from the field but if I’m interested in it or it matters to me.” Myles explained how his approach is different with different disciplines:

> I'm not a big literature reader, like I don't read novels or anything like that really, but when I DO, typically I'll look at the title or like go to the summary [on] the back of the book so I can get a general idea what I'm getting myself into and then dive headfirst in. Most of the time, if I'm reading something technical, I'm writing down formulas, writing down examples.

Samuel had lots of thoughts in his response on handling different subjects:

> They're all written differently. A scientific journal is meant to be looked at by scientists or students who need to find specific things. A lot of stuff that I may need is in the background section rather than the methodology. Last semester I took a Stats class and a Web Fundamentals class - those are completely different; math is math... In math texts, it's like here's the basics, here's an example, so skimming doesn't work. For the Learning Frameworks class, in the Callings book, there are a lot of dialogues so it just doesn't flow without the context so I read everything.

Amber shared her thoughts on reading in different disciplines:

> For a textbook, I have pens and highlighters ready so I can take notes. With a novel, I read it like I read a book, mostly straight through, but I have a paper for notes. For journal articles or other things, it depends on why I'm reading what I'm reading. Math and Science classes, well, I really hate those classes. They're harder for me and I made sure to get those out of the way right away years ago. With something like math, I read the paragraphs slowly and rewrite them in my own words. It has to be really neat and clear, it can't be messy with notes in the margins and stuff or it will be confusing. Those are harder subjects so it has to be more of what the book actually said and not my own words.

Under Benefits, common sub-themes were General Benefits of Strategy Use, Time Management and Efficiency, and Broadening World View and Perspective. The External Factors subcategory included Academic Requirements, Practical Considerations, and Professor. Internal Factors included Interests and Personal Purposes, as well as Learning and Academic Goals. Finally, Disciplines did not contain more specific sub-themes but a large variety of academic disciplines, general topics and even authors, all of which students mentioned when describing why they chose to approach readings in a certain way or use particular strategies.

Five out of six participants described how using strategies while reading affected their overall experience as a student, mentioning multiple benefits. Belinda shared, "It

100% helps. Otherwise, you wouldn't understand as well. It takes longer, but it saves time in the long run." Myles also mentioned the benefit of reading strategies to time management:

> Number one is time management...In college, ...time management is the most critical thing, so I don't read word for word everything because I ain't got time for that, so, yeah, it's definitely for time management, and then...for my understanding. Once I've read it enough that I feel like I understand it, I'm done.

Amber explains her approach to different subjects:

> Writing in the book and making notes...helps me to understand because it's in my own words. It's a quick reference for study or I can complete projects faster because I have my own sort of guide to follow. It takes longer to read with strategies sometimes but it doesn't take as much time when I look at it later because it makes more sense already.

Samuel, a full-time employee who studies part-time to finish out the IT degree he was unable to finish before entering the workforce years ago, noted "It absolutely makes a difference. It's time management. I don't have that kind of free time, so when I read, I'm usually really focused on the objective."

Among the interview participants, three were non-traditional students working on a degree mid-career or to start a new career, as has become the norm in most American colleges (NCES, 2015; Hutchens, 2016). The other three participants were of traditional college age but were commuter students who also felt the pressures of time and balancing school work with other elements of their lives. The student interviews reveal a small piece of the picture regarding how students make choices in academic reading. Their shared insights shed light on the role that metacognitive reading strategies could play in students' management of learning tasks, a key to student retention.

Summary of Findings

Among most of the students in this study, there are patterns of metacognitive reading strategy use that are obvious in both survey data and interview comments. These patterns seem to indicate that students have some awareness of a variety of strategies and that the students use at least some strategies with varying regularity. Strategies mentioned by the six interview participants were also indicated by many of the survey takers as preferred ways to handle reading tasks. While the survey responses scratched the surface of metacognitive reading strategy uses, the interview comments revealed much of the thinking process involved in making those strategy choices, as well as some of the ways that such strategy use affects the students' experience.

Conclusion

As a previously uninvestigated piece of the retention puzzle, metacognitive reading strategy use is a worthwhile factor to examine further. Student voices were heard regarding their time limitations and experience with school work and learning, and the role that reading strategies have played in these domains. This study has shed light on the patterns of strategy type and frequency of use by individuals, but also by college of study. This information can have implications in curricular design and teaching practice, as well as academic support program design and coordination.

CHAPTER V:

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to investigate the possible relationship between student use of metacognitive reading strategies and student retention in higher education. Metacognition is a crucial academic skill (Chevalier, Parrila, Ritchie, & Deacon, 2017; Carlston, 2011) that most university students do not possess when they arrive or even later in their course of study. Reading is another major factor in autonomous student learning and college success, with academic texts often requiring additional skills and effort from the reader, yet reading is also typically underdeveloped in most college students (Good, 2009). An estimated 85% of college learning happens through independent reading (Drayton, 2016), and as many students are not “traditional” in age and life circumstances, it is likely that ineffective or inefficient reading practices are a factor in student attrition due to their time constraints. Jitendra, Burgess & Gajria (2011) note that skilled readers are efficient, as well as able to comprehend text accurately. This efficiency that comes with metacognitive reading skills could be the difference for many students who are struggling to complete coursework and graduate.

Retention has been an ongoing concern for U.S. higher education since the middle of the last century, as access to higher education and numbers of non-traditional students continue to rise incrementally (Hunsaker & Thomas, 2013). As opposed to the classic four-year completion timeline of most bachelor’s degree programs, it is now far more common for college students to never complete their four-year degree or to take longer than six years for completion (Dept. of Education, 2012). Naturally, higher education institutions around the country have dedicated efforts to increasing satisfactory retention rates of undergraduate students and ultimately ensuring student graduation (Ahuna, 2011). In the seventh decade of this student retention issue, there are many and varied support attempts taking place on campuses around the country. These include disability accommodations for those with physical and learning disabilities, first-generation and non-traditional student programming for students who need support navigating the higher education system and becoming involved in campus life or even paying for college. These retention efforts also include academic supports like tutoring in content areas and writing, and academic coaching or peer mentoring to develop effective time management and positive study habits. One rare support at the university level is the explanation and modeling of metacognitive reading skills, despite a plethora of research supporting metacognition's role in successful learning and reading's crucial role in the dissemination of information in higher education and indeed, life (Stahl & Armstrong, 2018; Perin, 2013). Metacognitive reading strategy use could prove to be a valuable addition to existing multi-faceted solutions to unsatisfactory higher education student retention. This is an explanatory mixed methods study combining student reported use of metacognitive reading strategies via a survey instrument with qualitative data from student interviews to determine if metacognitive reading strategy instruction and support could be a worthwhile addition to the higher education retention effort.

Summary of Results

Research question one regarding whether or not a possible relationship exists between student use of metacognitive reading strategies and retention in higher education was answered using student responses to the Metacognitive Awareness of Reading Strategies Inventory (MARSI) and student enrollment data from the host institution. The MARSI survey asked students to indicate how frequently they employed individual reading strategies, with each item composed as an "I" statement with a specific action. The overall average of student reading strategy use was compared to the rate of retention for the participants, using a Fisher's exact test. The Fisher's exact test showed that there was a statistically significant difference in the rate of student retention in higher education when students employed a particular level of metacognitive reading strategy use. This finding seems to support the growing body of research establishing positive relationships between student metacognition and higher levels of student learning (Barnes, 2012; Saenz, et al, 2017).

Research question two regarding whether there was a difference in the number of metacognitive reading strategies utilized in various subject areas was addressed through comparing the number of disciplines in which students indicated they had used strategies. Students used a check-boxed list of course subjects at the end of the MARSI survey to indicate course subjects for which they had personally used metacognitive reading strategies. These course subjects were later grouped by the researcher into five overarching disciplines: Humanities, Education, Business; Communication, Language & Literature; Science/Technology/Engineering/Math (STEM). The researcher used descriptive statistics to determine the average number of disciplines in which students reported strategy use, as well as the most and least frequently reported disciplines overall for strategy use. In the process of employing descriptive statistics, the researcher observed other patterns regarding student use of metacognitive reading, such as which particular strategies and groups of strategies (as evidenced by MARSI survey item responses and subscale averages) were the most and least commonly utilized by students overall and by college of study. Conversely, which colleges of study showed highest and lowest frequency of overall metacognitive reading strategy use also became apparent; these were Education and Business respectively. The results of research question three present possibilities for areas of future study to address the dearth of research on the topic of discipline-related patterns of reading strategy use.

Research question three regarding how using metacognitive reading strategies affects students' perceptions of their school work was answered through a triangulation of qualitative measures with quantitative data from MARSI surveys and findings of a body of research on metacognition, retention, and attribution theory. The qualitative element of the study consisted of standardized interviews with six students from the study sample, eliciting whether or not students utilized metacognitive strategies when reading, how they chose which strategies to employ, where and when they employ them, and if and how their use of the strategies affected their experience as a student completing coursework. In addition to the traditional method of coding the interview transcripts for themes, the researcher also employed a linguistics research method known as corpus analysis to count contextually relevant recurring words from the aggregated body of words (corpus) of all interviews. These recurring words used by students were grouped into themes and subthemes that painted a more comprehensive picture of real students' practices and experiences regarding metacognitive reading strategies. This insight into student perceptions, habits and motivations can serve as inspiration for further research into strategy use but is also key to designing effective metacognitive reading strategy instruction and support programs.

Implications

The use of reading strategies should be somewhat familiar to all students, so it is not unexpected that most students in the study reported using at least some strategies with some regularity. It is also not surprising that most students in this study had a "medium" level of strategy use according to their MARSI responses, while far fewer had a "high" level of use. Bauer (2014) reminds us that some limited metacognitive strategies are taught throughout K-12, but many students never actually develop metacognition as an overall skill. This means reading strategies are generally at least familiar to students, but students may have limited ability to put them into use or have a limited and inadequate collection of strategies mastered. Some of the reading strategies most significant to retention, the Support strategies, are typically not among those commonly taught at any level of education (Mokhtari & Reichard, 2002). It is therefore not surprising that the Support subscale group of strategies, including actions such as taking notes while reading and paraphrasing or summarizing what has been read, was reported far less than other subscale strategies by the students in this study. What this means for the classroom and for individual student success is that college educators can expect students to arrive at their institutions with only a partially-filled toolbox of metacognitive reading strategies. Filling this toolbox through well-crafted instruction and support programming in metacognitive reading strategies could prove an effective means of empowering students to succeed in courses and complete their degree programs.

Interview participants in the study reported taking multiple strategic actions during reading. This aligns with the concept established in multiple studies that reading is complex and interactive, as well as self-regulatory, and requires executive functions like inhibition and shifting in order to stop reading irrelevant information or switch to a new task or strategy as needed (Borella, Carretti, & Pelegrina, 2010; Jake Follmer & Sperling, 2018). The methodical and varied strategy use reported by interviewed students is also frequently associated with academic success. Barnes (2012) states that successful learners monitor and regulate their learning, assess their progress, flexibly strategize, and reflect and react in their learning. All students interviewed in this study described actions and thought processes that add up to metacognition, which according to Nash-Ditzel (2010), has three key elements: declarative, or knowing what purpose a strategy is useful for; procedural, or when/how/where to use it, and conditional, or why/in what situation to use or adjust the strategy.

According to Gillis (2014), discipline and literary genre are also key considerations for skilled reading. The majority of students surveyed in this study demonstrate some awareness of how strategies can be used in different disciplines and genres. MARSI survey responses indicated that students tended to use some strategies and subscales of strategies more or less depending on their college of study. While almost no students reported using reading strategies in all five disciplines, most of the students did indicate use in at least disciplines, including disciplines that were outside of their college of study, presumably core curricular requirements and/or elective courses, such as Communication, Language & Literature courses for a STEM major or STEM courses for an Education major. This study's student interview responses on the topic also seem to support the finding that students use an awareness of discipline and genre formats and requirements to make effective choices of strategies between disciplines. Interview participants mentioned choosing what sections to read or take notes on based on technical or narrative nature of text, the page layout and clues in font type or color features, and the predictable structure of standardized disciplinary texts such as academic journal articles or case studies. The level of awareness displayed and detail provided varied with student level and experience. Course instructor guidance and teaching of disciplinary norms regarding text format, style and organization could begin with freshman level core requirements and continue through advanced courses. Such disciplinary literacy could prove beneficial to students' awareness of how each discipline and genre can be constructively approached and then an appropriate, effective reading strategy chosen and employed. This would create an opportunity for students to develop a sense of control in the learning process. Attribution theory applied in educational context has demonstrated that students are more likely to persist when they feel that they have some control managing the factors in their success or failure in the learning process (Schunk & Zimmerman, 2006).

Additionally, text structures are helpful when a reader needs to organize facts and ideas, which in turn increases the reader's retention and recall of information; Hebert, Bohaty, and Nelson (2016) advise the explicit teaching of various types of expository text structures within disciplines. When a reader identifies a text's structure, they can more easily and accurately discern the author's purpose, organize ideas based on importance, and save processing time by following the schema established in the reading. This frees up cognitive resources and increases comprehension of content (Hebert, et al., 2016). In this study, multiple interview participants reported their observation that when they employ reading strategies and consider discipline and genre in text organization and format, they can more accurately determine what information from a text is important, ultimately comprehend what they are reading better, and save time in the long run. Altogether, these positive experiences resulting from disciplinary knowledge and appropriate strategy use created what students expressed to be a deeper yet simpler and more satisfying experience as a student, which empowers them to complete their work and reduces frustration that could otherwise hinder assignment completion.

Students in this study's interviews also mentioned the role of topic interest and personal goals in their willingness to read material and in the level of strategies they apply to the text. It is noteworthy that nearly all interviewees raised the point of interest and goals themselves; none of the standardized interview questions hinted at or inquired about personal topic interests or goals. Several studies have consistently found a positive association between topic interest and reading comprehension. This association still exists when other factors like cognitive ability and prior knowledge are accounted for (Soemer & Schiefele, 2019). A proposed theory is that topic interest encourages the automatic allocation of attention to a text, and this then makes it possible for the reader to more efficiently process text information. One collateral effect of the automatic allocation of attention to a text is that the reader now has cognitive resources newly available and can shift this cognitive energy and capacity to another task, which could include higher order thinking activities like evaluating and synthesizing ideas (Soemer & Schiefele, 2019). The information provided by students in this study regarding their reading and strategy choices in relation to their interests and goals is supported by evidence in multiple studies finding better reading comprehension and increased metacognition corresponding to higher topic interest and relevance to personal goals.

Recommendations

It is recommended that universities coordinate curricular efforts to include the explanation and modeling of discipline-specific reading strategies for textbooks, articles and other genres of course-related content. Professors are expert readers within their fields, but many intuitively became so over time with practice and a natural instinct toward metacognition which many academically successful people develop without direct instruction. This would expose all students to lesser-known strategies, such as the Support strategies category from the MARSI, the most underutilized set of strategies by students in this study, as well as the handful of lesser-used Global strategies that may be particularly helpful with reading different disciplines or genres. These discipline and genre strategies include surveying the organization of a text to determine what information is available and how it is laid out, as a precursor to reading, or using graphics common to the discipline at hand to support reading comprehension or minimize the amount of text necessary to reach the target information Bharuthram (2012) argues that it is the duty of higher education institutions to guide student development of suitable reading practices for success in university study and urges a pan-curricular effort of reading strategies taught in content area classrooms.

The significance of student interests and goals is also noteworthy and should be considered in the realm of higher education curriculum and instruction. The overlapping findings of this study and the many other studies on student interest's role in effective learning point to the powerful potential for instructors to maximize student learning in courses by discovering students' interests and goals. Instructors can then utilize this knowledge of student goals and interests in course delivery, as well as allowing an element of choice wherever possible in readings required to complete assignments. Alignment of curricular tasks with student interests and goals is not a service that academic support can provide students individually in a practical way. It is a recommendation that would require implementation by departments and instructors in order to provide students with a meaningful course experience.

The initial findings of the study point to metacognitive reading strategies as a useful tool in increasing undergraduate student retention, but this study only begins to answer the question of how reading strategy use can be part of the retention solution. Similar studies should be done with undergraduate students at a variety of institution types and sizes, as well as with graduate students, to determine if the effects of the reading strategy use hold true across differing context and levels of study. To mitigate the study limitation of reliance on a self-report measure, future studies on metacognitive reading strategy use should utilize observations of reading tasks with later document analysis to determine what strategies students actually employed. Think-aloud protocols would also be a meaningful way to gather real time metacognitive information on how and why a student is making strategy choices on the text they're working on. Think-aloud tasks have been invaluable in the effort to understand the metacognition behind the writing process ((Hayes & Flower, 1980) and it is logical to apply them to the metacognitive nature of effective reading strategy.

Conclusions

The issue of poor retention and graduation rates in the U.S. is not likely to disappear in the near future. As the educational landscape continues to grow in diversity and inclusivity, the need for reading strategy instruction will also grow. All students can benefit from such instruction in terms of academic success but also by developing agency in their learning experience and increasing their likelihood of persistence and degree completion. School-wide, coordinated implementation of discipline-specific reading strategies can support students in reading skill remediation while also developing them as scholarly readers and encouraging their retention. As a retention measure and curricular effect, promoting metacognitive reading strategy development and use could be the key to ensuring more students persist to become critically thinking graduates of our higher education institutions.

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APPENDIX A:

SURVEY COVER LETTER

Dear UHCL Student:

Greetings! You are invited to complete the (Metacognitive Awareness of Reading Strategies) MARSI survey. The purpose of this survey is to examine the use of reading strategies by university students and a possible relationship to how long the students continue working toward a degree. The data obtained from this study will not only allow me to determine how often and how students use reading strategies, but will also inform UHCL academic support programs for current and future students.

Please answer all the questions. Filling out the linked online survey is entirely voluntary, but answering each response will make the survey most useful. This survey will take approximately 15 minutes to complete and all of your responses will be kept completely confidential. No obvious undue risks will be endured and you may stop your participation at any time. In addition, you may benefit academically from a raised awareness of the variety of reading strategies available and your personal habits regarding reading. You will not be compensated or benefit in other ways.

Your cooperation is greatly appreciated and your willingness to participate in this study is implied if you proceed with completing the survey. Your completion of the *MARSI* survey is not only greatly appreciated, but invaluable. If you have any further questions, please feel free to contact me at (guler@uhcl.edu). Thank you!

Sincerely,

Becca Guler, M. Ed.
Learning Specialist
Student Success Center
University of Houston-Clear Lake
(281) 283- 2454
guler@uhcl.edu

APPENDIX B:

INFORMED CONSENT

Interview Informed Consent

TITLE OF STUDY The Relationship Between Use of Metacognitive Reading Strategies and Student Retention in Higher Education

PRINCIPAL INVESTIGATOR
Rebecca Guler, Student Success Center
2700 Bay Area Blvd. Houston, TX 77058
281-283-2454 guler@uhcl.edu

PURPOSE OF STUDY You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information. The purpose of this study is to evaluate the use of reading strategies by university students in a variety of courses and investigate a possible connection to grades and retention (staying enrolled and pursuing a degree).

STUDY PROCEDURES Metacognitive reading strategies are those that help the reader to 1) assess what they do and don't understand, 2) evaluate if their current approach to the reading is working or needs to be adjusted or abandoned, and 3) determine a reading solution for necessary comprehension and memory. You are invited to volunteer to participate in a 20-minute interview, to discuss your experience with metacognitive reading strategies, such as if you used them and why, which types are more or less helpful in different types of classes, and if the strategies have an effect on how easy or difficult it is to be a student. Interviews will be video or audio-recorded in order to later transcribe statements and look for patterns in information provided from multiple interviews. No participants will be identified in published form.

RISKS There are no significant risks to participants. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

BENEFITS There is very little research on the potential long-term benefits of metacognitive reading strategies. This academic skill has been cited by professors in institutions around the U.S. as a key factor in student success, yet there is little evidence directly linking reading strategies with student retention and performance. This information may be a missing piece of the puzzle in supporting students academically. At the same time, you will learn more about metacognitive reading strategies and potentially become more self-aware of your reading skills and habits.

Page **1** of **2 Participant's Initials: ________**

Interview Informed Consent

CONFIDENTIALITY

A pseudonym will be used in place of your name when interview scripts or data are included in reports. Every effort will be made by the researcher to preserve your confidentiality including the following:

● All enrollment data will be handled in confidentiality per FERPA guidelines and de-identified before statistical analysis and sharing of results.

● Digital data will be passworded and printed data will be kept in a locked filing cabinet in the researcher's office, accessible only to the researcher and assistant. Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

CONTACT INFORMATION If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Investigator, please contact the UHCL Committee for the Protection of Human Subjects at 281.283.3015.

VOLUNTARY PARTICIPATION Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature ______________________________ Date __________

Investigator's signature ______________________________ Date __________

Page **2** of **2 Participant's Initials: ________**

APPENDIX C:

SURVEY INSTRUMENT THROUGH QUALTRICS

Use the slider to show how often you use each reading strategy for academic purposes (textbooks, articles, powerpoints, etc.)
If using a cell phone, turning your phone horizontally may optimize the display so it's easier to read the choices.

Use the slider to show how often you use each reading strategy listed.

Q1.

October 2018

Dear UHCL Student:

Greetings! You are invited to complete the MARSI (Metacognitive Awareness of Reading Strategies) survey. The purpose of this survey is to examine the use of reading strategies by university students and a possible relationship to how long the students continue working toward a degree. The data obtained from this study will not only allow me to determine how often and how students use reading strategies, but will also inform UHCL academic support programs for current and future students.

Please answer all the questions. Filling out this survey is entirely voluntary, but answering each response will make the survey most useful. This survey will take approximately 10 minutes to complete and all of your responses will be kept completely confidential. No obvious undue risks will be endured and you may stop your participation at any time. In addition, you may benefit academically from a raised awareness of the variety of reading strategies available and your personal habits regarding reading. You will not be compensated or benefit in other ways (with the exception of 5 pts credit toward the Scavenger Hunt assignment for First-Year Seminar/Learning Frameworks/Psych 1100 students).

Your cooperation is greatly appreciated and your willingness to participate in this study is implied if you proceed with completing the survey. Your completion of the *MARSI* survey is not only greatly appreciated, but invaluable. If you have any further questions, please feel free to contact me at (guler@uhcl.edu). Thank you!

Sincerely,

Becca Guler, M. Ed.
Learning Specialist
Student Success Center
University of Houston-Clear Lake
(281) 283- 2454
guler@uhcl.edu

◯ I agree. Let's do this!

◯ I do not want to participate.

Q2.

I have a purpose in mind when I read.

	Never/Almost Never	Sometimes	Often	Usually	Always/Almost Always
	1	2	3	4	5
How often?					

Q3.

I take notes while reading to help me understand what I read.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q4. I think about what I already know (from other courses or life) to help me understand what I read.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q5. I preview the text to see what it's about before reading it.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q6. When text becomes difficult, I read aloud to help me understand what I read.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5

1	2	3	4	5

How often?

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

Q7. I summarize (out loud or in writing) what I read to reflect on important information in the text.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q8. I think about whether the content of the text fits my reading purpose.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q9. I read slowly but carefully to be sure I understand what I'm reading.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q10. I discuss what I read with others to check my understanding.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q11. I skim the text first by noting characteristics like length and organization.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q12. I try to get back on track when I lose concentration.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q13. I underline or circle information in the text to help me remember it.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q14. I adjust my reading speed according to what I'm reading.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q15. I decide what to read closely and what to ignore

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always

Q16. I use reference materials such as dictionaries to help me understand what I read.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q17. When text becomes difficult, I pay closer attention to what I'm reading.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q18. I use tables, figures, and pictures in text to increase my understanding.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q19. I stop from time to time and think about what I'm reading.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q20. I use context clues (other information in the same reading) to help me better understand what I'm reading.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often? Never/Almost Never | Sometimes | Often | Usually | Almost Always/Always

Q21. I paraphrase (restate ideas in my own words) to better understand what I read.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q22. I try to picture or visualize information to help remember what I read.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q23. I use typographical aids like bold print and italics to identify key information.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q24. I critically analyze and evaluate the information presented in the text.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q25. I go back and forth in the text to find relationships among ideas in it.

Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
1	2	3	4	5

How often?

Q26. I check my understanding when I come across what appears to be conflicting information.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q27. I try to guess what the material is about when I read.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q28. When text becomes difficult, I re-read to increase my understanding.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q29. I ask myself questions that I want to have answered in the text.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q30. I check to see if my guesses about the text are right or wrong.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
	1	2	3	4	5
How often?					

Q31. I try to guess the meaning of unknown words or phrases.

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always

	Never/Almost Never	Sometimes	Often	Usually	Almost Always/Always
How often?	1	2	3	4	5

Click on each subject you use at least some of the above reading strategies in.

Q32. In which subjects/fields do you/did you use at least some of these strategies when reading for classes or research?

☐ Literature/composition ☐ History ☐ Political Science/Government

☐ Psychology/Behavioral Science ☐ Sociology/Criminology/Anthropology

☐ Communication/Journalism ☐ Foreign Language ☐ Philosophy/Ethics

☐ Fine Arts (such as Art, Music, Design) ☐ Biology ☐ Chemistry ☐ Physics ☐ Engineering

☐ Math ☐ Statistics (Business or Research) ☐ Computer Science/Engineering/SWEN/MIS

☐ Education ☐ Instructional Technology ☐ Nursing ☐ Accounting ☐ Economics/Finance

☐ Marketing/Management ☐ Healthcare Administration ☐ Health and Fitness

☐ Other (type in) ________

☐ Other (type in) ________

☐ None- I never use/used reading strategies for any type of course

Do you need to receive credit for the survey for the First Year Seminar course?

Q33. Do you need to receive credit for this survey for the First Year Seminar (Learning Frameworks- Psych 1100) course?

○ Yes

○ No

Q34. Please enter your name, Student ID and email so you can receive a confirmation of your participation to show your professor to verify your points for your Scavenger Hunt.

Name ________

Student ID # ________

Email address (school or personal- either is fine) ________

APPENDIX D:

MARSI SURVEY WITH SCORING RUBRIC

Metacognitive Awareness of Reading Strategies Inventory
(MARSI) Version 1.0
Kouider Mokhtari and Carla Reichard © 2002

DIRECTIONS: Listed below are statements about what people do when they read academic or school-related materials such as textbooks, library books, etc. 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, **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.

TYPE	STRATEGIES	SCALE				
GLOB	1. I have a purpose in mind when I read.	1	2	3	4	5
SUP	2. I take notes while reading to help me understand what I read.	1	2	3	4	5
GLOB	3. I think about what I know to help me understand what I read.	1	2	3	4	5
GLOB	4. I preview the text to see what it's about before reading it.	1	2	3	4	5
SUP	5. When text becomes difficult, I read aloud to help me understand what I read.	1	2	3	4	5
SUP	6.I summarize what I read to reflect on important information in the text.	1	2	3	4	5
GLOB	7. I think about whether the content of the text fits my reading purpose.	1	2	3	4	5
PROB	8. I read slowly but carefully to be sure I understand what I'm reading.	1	2	3	4	5
SUP	9.I discuss what I read with others to check my understanding.	1	2	3	4	5
GLOB	10. I skim the text first by noting characteristics like length and organization.	1	2	3	4	5
PROB	11. I try to get back on track when I lose concentration.	1	2	3	4	5
SUP	12. I underline or circle information in the text to help me remember it.	1	2	3	4	5
PROB	13. I adjust my reading speed according to what I'm reading.	1	2	3	4	5
GLOB	14. I decide what to read closely and what to ignore.	1	2	3	4	5
SUP	15. I use reference materials such as dictionaries to help me understand what I read.	1	2	3	4	5
PROB	16. When text becomes difficult, I pay closer attention to what I'm reading.	1	2	3	4	5
GLOB	17. I use tables, figures, and pictures in text to increase my understanding.	1	2	3	4	5
PROB	18. I stop from time to time and think about what I'm reading.	1	2	3	4	5
GLOB	19. I use context clues to help me better understand what I'm reading.	1	2	3	4	5
SUP	20. I paraphrase (restate ideas in my own words) to better understand what I read.	1	2	3	4	5
PROB	21. I try to picture or visualize information to help remember what I read.	1	2	3	4	5
GLOB	22. I use typographical aids like bold face and italics to identify key information.	1	2	3	4	5
GLOB	23. I critically analyze and evaluate the information presented in the text.	1	2	3	4	5
SUP	24. I go back and forth in the text to find relationships among ideas in it.	1	2	3	4	5
GLOB	25. I check my understanding when I come across conflicting information.	1	2	3	4	5
GLOB	26. I try to guess what the material is about when I read.	1	2	3	4	5
PROB	27. When text becomes difficult, I re-read to increase my understanding.	1	2	3	4	5
SUP	28. I ask myself questions I like to have answered in the text.	1	2	3	4	5
GLOB	29. I check to see if my guesses about the text are right or wrong.	1	2	3	4	5
PROB	30. I try to guess the meaning of unknown words or phrases.	1	2	3	4	5

Reference: Mokhtari, K., & Reichard, C. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology*, 94 (2), 249-259.

Metacognitive Awareness of Reading Strategies Inventory

SCORING RUBRIC

Student Name: ____________________ Age: ________ Date: ________________

Grade in School: □ 6th □ 7th □ 8th □ 9th □ 10th □ 11th □ 12th □ College □ Other

1. Write your response to each statement (i.e., 1, 2, 3, 4, or 5) in each of the blanks.
2. Add up the scores under each column. Place the result on the line under each column.
3. Divide the score by the number of statements in each column to get the average for each subscale.
4. Calculate the average for the inventory by adding up the subscale scores and dividing by 30.
5. Compare your results to those shown below.
6. Discuss your results with your teacher or tutor.

Global Reading Strategies (GLOB Subscale)	Problem-Solving Strategies (PROB Subscale)	Support Reading Strategies (SUP Subscale)	Overall Reading Strategies
1. ________	8. ________	2. ________	GLOB ______
3. ________	11. _______	5. ________	
4. ________	13. _______	6. ________	PROB______
7. ________	16. _______	9. ________	
10. _______	18. _______	12. _______	SUP ______
14. _______	21. _______	15. _______	
17. _______	27. _______	20. _______	
19. _______	30. _______	24. _______	
22. _______		28. _______	
23. _______			
25. _______			
26. _______			
29. _______			
_____ GLOB Score	_____ PROB Score	_____ SUP Score	______ Overall Score
_____ GLOB Mean	_____ PROB Mean	_____SUP Mean	______Overall Mean

KEY TO AVERAGES: 3.5 or higher = High 2.5 – 3.4 = Medium 2.4 or lower = Low

INTERPRETING YOUR SCORES: The overall average indicates how often you use reading strategies when reading academic materials. The average for each subscale of the inventory shows which group of strategies (i.e., global, problem-solving, and support strategies) you use most when reading. With this information, you can tell if you are very high or very low in any of these strategy groups. It is important to note, however, that the best possible use of these strategies depends on your reading ability in English, the type of material read, and your purpose for reading it. A low score on any of the subscales or parts of the inventory indicates that there may be some strategies in these parts that you might want to learn about and consider using when reading (adapted from Oxford 1990: 297-300).

APPENDIX E:

PERMISSION TO USE MARSI INSTRUMENT IN STUDY

From: Kouider Mokhtari
To: Guler, Becca
Cc: Carla Reichard
Subject: [External] Re: Permission to use MARSI in study
Date: Friday, November 2, 2018 7:14:56 PM
Attachments: image001.png

Hi Becca—

Thanks for your interest in using the MARSI instrument in your research. As authors, we are pleased to grant you permission to use as long as you do not modify it in any way. You have selected an important and unique question that has not been explored much previously. Best of luck in your research. If you have further questions or need additional information about the MARSI instrument, let us know.

Kouider

Kouider Mokhtari, Ph.D.
Anderson-Vukelja-Wright Endowed Chair, Literacy
Director, K-16 Literacy Center
College of Education & Psychology

The University of Texas at TYLER

3900 University Boulevard ¦ Tyler, Texas 75799
Office 903.566-7177
kmokhtari@uttyler.edu ¦ Webpage

From: "Guler, Becca" <Guler@UHCL.edu>
Date: Friday, November 2, 2018 at 4:28 PM
To: Kouider Mokhtari <kmokhtari@uttyler.edu>
Subject: Permission to use MARSI in study

Dear Dr. Mokhtari,
I would like to use the MARSI (including attaching a copy of the instrument in my appendix) in my dissertation study, which looks at the possible relationship between student use of metacognitive reading strategies and their retention in higher education.

Please let me know if you would like further details regarding the study.

Thank you in advance,
Becca Guler, Ed.D. candidate in Educational Leadership, Language and Literacy
University of Houston- Clear Lake

APPENDIX F:

INTERVIEW QUESTIONS

1) How often do you read the assigned stuff for classes?

2) How do you choose what readings to do and what to skip?

3) Tell me about how you approach a reading assignment.

4) Do you approach different types of readings (textbook, novel, journal article, blog, PowerPoint) differently? How?

5) Tell me about your reading approach with different classes/different fields of study?

6) Are some strategies more effective in some types of your courses than others?

7) Do you take any kind of notes while you're reading, and where?

8) What do you do with the information you get from the reading once you're finished?

9) What effect does using reading strategies have on your experience as a student?
   (if elaboration needed, "for example, do you think it affects your time management?
   Your understanding? Your speed? Your grades? Anything else?")

APPENDIX G:

CORPUS BY CATEGORY FROM INTERVIEWS

ACTIONS

STRATEGIES

CHUNKING

Sections of text	
100 (p. sections)	1
700 (7-800 p.)	2
Block (content)	13
Page (read/turn p, how many p)	8
Paragraphs	1
Part (read a part of, main)	2

Sections of text (cont'd)	
Passages	1
Chapter(s)	7
Section	16
Sentence(s)	6
Structure (format, blocks)	2

Blocks & breaks	
10-minute (break)	2
15-minute (break)	1
30-minute (read/study)	1
5-minute (break)	1
Take (break)	2

INTERACTING WITH TEXT

Text marking	
Underline	2
Understand (info, read enough to u)	9
ready (pens & HLs)	1
Arrows (notes)	1
asterisk	1
Pen(s) (in hand)	2
mark	2
manually	1
Highlight	5
Color	2
different (color-hl)	2

Looking for	
Title (read the t)	1
main (parts)	1
Important (marks imp w)	4
Italicized	1
Jargon (in chart)	1
key (words, sentences, phrases)	6
certain (lines or passages)	1
Clues	1
Foreshadowing	1
Formula (s)	4
Dialogues	1
Cues	1
Definitions	1
Details	1
Headings	2
Examples (wr down, rework)	4
Question (N)	3
Blue	2
Bold	1
Tables	1
Theme	1
Theorem	1

During reading	
Start	4
Around (get around- skip)	3
Find/found (info, specifics, etc.)	12
Refer/ reference(s)(ed) (info)	6
Put (personal views aside)	1
Pick (out-ideas)	2
Point (find points)	7
Next (block of text, move on to n)	3
Forth (go back & f)	1
Gist	2
General (idea)	1
Go back (notes)	3
Go (back in text)	5
Interpret (content)	2
Skip, leave (skip)	8
Skim/skimming	13
Slowly (read)	1
Scan (until find it)	1
Right (skip r over)	1
Section (reads background s)	1
Stop (and look or take notes, etc.)	3
Stop (ineff.Strat, take break)	2
Twice (same page tw)	2
Through (read thr/str through, skim thr)	10
Thought (jot down)	1
Enough (read e to und)	1
Look/looking	11
Lost (if lost, reads more)	1
Use(s)(n), useful	2
Use(info, res, chart, str, notes/n cards)	14
Strategy/ies	4
Stuck (when I'm st)	1
Think(if think be asked, th what is imp)	5
Whole (read w thing)	1
Work (w my way through..)	1

Pre-reading	
Before (I read)	1
First (before reading)	1
Even (before you start)	1
Syllabus	1
Summary (go t sum in back of ch)	1

Post-reading	
Review	4
Rework (problems)	1
Study, studying	6

Writing strategies	
Margins	3
Notebook	1
Jot (down)	3
Note(s)-take, make,write, etc.	24
Notes (review, reread, sticky)	3
Write/ing/written	15
Scribble	1
Rewrite	2
System (reading notes)	1
Summary (write a s)	1
Words (rewr in own)	2

Connections/relationships	
Connections	1
Relate(d) (math-r, r to wh reading)	4
Relationship(find & understand b/w info)	2
Prior (info)	1
Think (wh I th is related)	1

Converting info	
Flashcards	1
Chart	2
Cheat sheet (list of talk pts)	1
Fill (in- info on chart)	1
Notecard(s)	4

APPROACHES

Choosing what to read	
Research(ing)	3
Assign(ed)(ment)	8
Log (reading log-HW)	1
Professor	1
Detail (tchr go into)	1
Quiz	3
Mentions (professor)	1
Test (do x for test, if on test, upcoming	9
Know (will be on exam)	1
Role	4
Time (how much)	4

Where/when to read	
Between (in-b/w classes)	1
Bedroom	1
Home office	1
Interrupted	1
Quiet	3
Sit (down- to read)	2
Shut (door)	1

Habits	
Usually	8
Normally (n just take notes)	1
Typically (i do x...)	3
Never (do more than has to)	1
Would (habit)	1
Sometimes	10
Definitely(read it, str. Diff.)	4

Text types/formats	
Text/textbook	8
Articles (journal)	1
Twitter	1
PDF	1
Novels	2
Online	1
Powerpoints	1
Story(ies)	2

Goal for information	
Retain	2
Remember (want/need to)	3
Information (recall, retain)	2

REASONING

BENEFITS

General benefits	
Definitely (helps, better)	3
Gain (info, time, understanding)	5
Know (what words mean b/c r strat.)	1
Forget (not f information)	1
Faster	1
Make (easier-to study) (a difference)	4
Handy	1
Harder (but worth it)	2
Helps (to understand, get finished, etc.)	8
100 (100% helps)	1
Absolutely (helps)	2
Words (b/c own)	1
Quick (reference for later)	1

Time/time management/efficiency	
Definitely (for tm)	1
Critical (tm cr)	1
Long (takes longer, saves time in long run)	1
Longer (takes)	1
Saves (time)	1
Hours	1
Much (as much time)	1
Took (more time, but.....)	1
Time (don't have time),(free, mgmt) (saves)	9
Time (timeline, hist)	2

World/society/perspective	
Around (world around you)	1
Against (your views)	1
Bigger (idea)	1
Bit (bit of knowledge about world)	1
Judgement (make a j)	1
Interpret (view)	1
Relationship (between books &/or world)	2
Shifting (society)	1
Personal (opinion or view)	2
World	2

EXTERNAL FACTORS

Professor	
100 (pages- prof. expectations/effort)	3
Above (& beyond)	1
Actually (read more/less)	2
getting (effort from me)	1
Information (if prof gives enough i)	1
Good (prof)	1
can't (give me- prof)	1
More (read more if prof...)	2
much (how much the prof...)	2
probable (teacher experience)	1
Professor/Teacher	6

Academic requirements	
Project	4
Quiz (for a)	2
Assigned	4
Homework	1
Essay	1
Grade	3
Final (exam)	1
Syllabus	1

Practical considerations	
Book (turn in, can't mark)	1
Bothers (marked up pages)	1
Depends (length, format)	2
Length	1
Highlighted (rented book)	1
Turn in (rented book)	1

INTERNAL FACTORS

Interest/personal purpose	
Again (read again b/c want)	2
Anything (to gain personally)	1
Anyway (read again despite not needed)	2
Application (practical)	1
Carefully (reads more)	1
Hate	2
Dumb (opin. Of book)	1
Depends (interest)	3
Novels (prefer)	2
Material (personal pref)	2
Matters (to me)	1
More (do, read carefully-int., Spend m tim	7
Lot (more-interest)	1

Interest/personal purpose (cont'd)	
Myself (need info for myself)	1
Interested/ing	9
Intrigued	1
Know (want to, interest)	2
Passion (for knowledge)	1
Much (don't like)	1
Really (don't want, interesting, hate m&s)	3
Something (interested in)	2
Purposes (for own)	1
Personal (thoughts, notes)	2
Think (i th is interesting)	1
Thirst	3
Want/wanna (don't w- non-novels)	6

Learning/academic goals	
Important (information, ideas, tasks)	8
Focused (on his objectve)	1
Reference (cultural)	1
Mean (what words & phrases)	1
Know/knowledge	10
Learn/learning	7
Remember (can't) (want to)	4
Understand (wouldn't u)/ understanding (for	11

DISCIPLINES

Disciplines, courses, subjects	
Chemistry	1
Child psych	1
Computer programming	1
Education (course/major)	3
English	8
Environment (about- int)	1
Democracy	1
Fundamentals (web)	1
Frameworks (learning)	1
Freshman seminar	1

Disciplines, courses, subjects (cont'd)	
George Orwell	1
Methodology	1
Ignition	1
John Clark (author)	1
Kinetic	1
Math/mathematical	14
History	3
Write/writing	3
Stats	1
Science	1

Disciplines, courses, subjects (cont'd)	
Mechanical engineering	1
Advanced writing	1
Public speaking	1
Physics	2
Technology	1
Novel	2
Subject (not so much subj as prof)	1
Subjects (different)	1
Different	4
Fields	1

APPENDIX H:

APPROVAL FROM COMMITTEE ON THE PROTECTION OF HUMAN SUBJECTS

University
of Houston
Clear Lake

Office of Sponsored Programs

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (CPHS)
Institutional Review Board (IRB)

REVIEW ACTION

DATE:	September 26, 2019
TO:	Jana Willis, PhD; Rebecca Guler
PROPOSAL TITLE:	The Relationship Between Use of Metacognitive Reading Strategies and Student Retention in Higher Education
REMARKS:	Expedited approval based on DHHS Code of Federal Regulations, HHS 45 CFR 46.101 (b) (4).

The Committee for the Protection of Human Subjects (IRB) for the University of Houston-Clear Lake has reviewed the subject research protocol and consent form(s) and approves the project as written. The research study may now be initiated. Any modifications in the study or to the informed consent procedure must receive review and approval prior to implementation unless the change is necessary for the safety of subjects.

Any adverse events encountered during the study must be reported promptly by calling 281.283.3015. Written documentation of the adverse event must be received by the IRB/CPHS via SP within five (5) working days. Any new and significant information that may impact a research participant's safety or willingness to continue in the study must also be reported.

This approval is for the maximum one year period, and will expire Click or tap here to enter text.. Prior to this expiration date, an approval for continuation of this protocol is required if you are to continue with data collection beyond the expiration date.

The UHCL CPHS is organized and operated according to the US Code of Federal Regulations and operates under Federalwide Assurance No. 00004068.

Sincerely,

on behalf of
Committee for the Protection of Human Subjects
Office of Sponsored Programs
sponsoredprograms@uhcl.edu

2700 Bay Area Boulevard Houston, Teas 77058 Telephone: 281.283.3015 Fax: 281.283.2143 www.uhcl.edu/research

University of Houston Clear Lake

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS

2700 Bay Area Boulevard
Houston, Texas 77058-1098
Telephone: 281.283.3015 Fax: 281.283.2143 Email: sponsoredprograms@uhcl.edu Website: uhcl.edu/research

CONTINUING REVIEW OF RESEARCH PROTOCOL INVOLVING HUMAN SUBJECTS
§46.109(e)

http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html#46.109

CPHS REVIEW DATE:	9/19/19
REVIEWER:	_______ ____________
TITLE OF STUDY:	The Relationship Between Use of Metacognitive Reading Strategies and Student Retention in Higher Education
PRINCIPAL INVESTIGATOR(S):	Rebecca Guler, EdD Candidate
STUDENT RESEARCHER(S):	Karissa Marks
FACULTY SPONSOR:	DR. JANA WILLIS
CPHS EXPIRATION DATE:	5/1/20 (adjusting methodology) **PROJECT END DATE:** 5/1/20
CPHS STATUS:	CURRENT

1. STATUS REPORT

A. Provide the total number of subjects enrolled to date: 76

B. Provide demographics of subjects enrolled to date:

Age range:	17-60
% Male:	40
% Female:	60

C. Provide information about additional enrollment of subjects expected for upcoming period: 30-50 additional subjects, same demographics

D. Provide information about subjects recruited –

D1. the number from whom data were received: 76

D2. the number who withdrew or were dropped and reasons: 0

D3. the number of complaints received from subjects about the study or their participation: 0

E. Provide details of any unanticipated problems or adverse events involving risks to subjects encountered to date: None encountered

F. Provide current assessment of the research and its related risks and benefits; e.g., any findings in the research that affect the risk-benefit ratio or suggest a need to amend or modify research protocol; any problems with privacy or confidentiality; etc.: Primary researcher no longer employed with UHCL and will not have direct access to student enrollment and demographic data. Will require an adjustment in protocol to acquire data and ensure student confidentiality.

G. Provide summarization of modifications made to the original protocol:

A CITI-trained student researcher who has access to student enrollment and demographic data will locate and add enrollment and demographic data to the spreadsheet of student MARSI survey responses. The student researcher has access to UHCL's EAB Navigate platform, which populates from data in the E-services system, as an aspect of employment as an academic coach with the campus Student Success Center. The student researcher will then randomize the list of responses and deidentify data by adding A-Z labels and removing names and student IDs, before sending completed quantitative data set to the principal investigator.

No modifications are necessary for the qualitative methodology of the study.

H. Provide amended informed consent form in two versions: modified version to be given to newly recruited participants and marked-up version identifying changes to the original informed consent form. Not needed.

2. CPHS APPLICATION *[See email with originally approved protocol attached.]*

<u>If there are no changes in the design or protocol, please state below</u>. If there are any modifications to the design or protocol, provide revised protocol with changes indicated by different font color.
There are no changed to design. See modifications to protocol described in G.

3. INFORMED CONSENT *[See email with originally approved informed consent attached.]*

<u>If there are no changes to the informed consent form, please state below</u>. If the informed consent forms needs to be revised, attach modified version for CPHS review and approval and marked-up version of original informed consent form. [See item (h) above].

No changes necessary

4.INSTRUMENTS *[See email with originally approved instruments attached.]*

Provide any new instruments or changes to originally approved instrument for CPHS review and approval. <u>If there are no changes, please state below</u>. No changes.