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An Analysis of Self-Regulated Learning Strategies, Academic Performance, and Satisfaction among Recent Online High School Graduates

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AN ANALYSIS OF SELF-REGULATED LEARNING STRATEGIES,
ACADEMIC PERFORMANCE, AND SATISFACTION AMONG RECENT ONLINE
HIGH SCHOOL GRADUATES

by

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ABSTRACT

AN ANALYSIS OF SELF-REGULATED LEARNING STRATEGIES, ACADEMIC PERFORMANCE, AND SATISFACTION AMONG RECENT ONLINE HIGH SCHOOL GRADUATES

Jenifer Lee Price
Old Dominion University, 2017
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Recent studies indicate a positive correlation between academic performance and metacognitive self-regulation (MSR) and effort regulation (ER). This relationship was explored across performance (e.g., higher and lower) and satisfaction (e.g., satisfied and dissatisfied) levels to help identify which self-regulated learning (SRL) skills were most critical for 102 recent graduates of online high schools. A mixed-methods design was employed to determine use of SRL strategies and to better understand participant experiences while learning online. Responses to surveys, open-ended questions, and ten follow-up interviews were compared and contrasted to assess the level of corroboration between quantitative and qualitative data in this study.

There were three main findings in this study. First, the relationship between SRL and academic performance was not statistically significant. Second, the ER means were higher in both academic performance groups, but not statistically significant. Third, there was a strong positive and statistically significant relationship between SRL and satisfaction. Future areas of research were suggested and insights were offered to secondary and postsecondary level practitioners.

Keywords: self-regulated learning strategies, metacognitive self-regulation, effort regulation, academic performance, satisfaction, mixed-methods

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This dissertation is dedicated to my husband Kenneth who sacrificially gave of his time to support my goals and encouraged me to continue the journey when life's circumstances were especially difficult. To my son Preston, I look forward to many more opportunities to play and learn together. I also dedicated this work to my father who passed away earlier this year, finally reuniting with my mother. Thank you, Dad, for always believing in me and for teaching us not to place limits on what we can accomplish. I love you and miss you immensely. Mom thank you for instilling within me a love of learning. The time we had together was short, but it had a profound impact on my life. To my pastor Jim Lillard, I will never forget the lessons you taught me about not quitting. I remember you saying, "It's always too soon to quit" and "If we don't quit, we win!" Lou Lillard, thank you for all the cards in the mail encouraging me along the way. Lastly, I dedicate this dissertation to my sisters Holly, Kimberly, and Jessica who are some of the most intelligent and ambitious women I know. Although I may be the oldest, you all are my role models.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Introduction

The number of secondary level students participating in coursework online across the various K-12 education sectors in the United States (U.S.), ranging from public schools and districts to charter school, private schools, and university schools, currently exceeds 2.2 million (Evergreen Education Group, 2015). A few years prior, the U.S. Department of Education reported over 1.3 million high schoolers studying at a distance (U.S. Department of Education, National Center for Educational Statistics, 2012). These numbers suggest a larger number of online K-12 programs are accessed by students in high schools (e.g., grades 9-12). Despite higher enrollment rates, online high schools are not exempt from the same issues faced by online postsecondary institutions. Online learners often struggle with low performance and high course dropout rates (Lee, Choi, & Kim, 2013; Winters, Greene, & Costich, 2008). This struggle with academic performance is even more evident within online or virtual high schools (Barbour & Reeves, 2009).

Academic performance, at any level and via any mode, can be better understood through a social cognitive lens. Bandura's (1991) social cognitive theory postulates "human functioning is regulated by an interplay of self-generated and external sources of influence" (p. 249). Its three principle subfunctions of self-monitoring, judgment of one's behavior in context, and affective self-reaction in conjunction with self-efficacy occur with any human behavior, inclusive of the learning process.

In online learning literature, researchers have also explored the variables of overall self-regulated learning (SRL), metacognitive self-regulation (MSR), and effort management or

regulation (ER). SRL has even been singled out as a potential antidote to poor academic achievement in online environments (Chmiliar, 2011). Plus, “careful deployment of SRL skills is especially critical for successful outcomes[,]...especially in distance environments” (Bol & Garner, 2011, p. 104-105). SRL research suggests there is a need for more studies identifying which self-regulation skills are most critical to student performance online (Kitsantas, Dabbagh, Huie, & Dass, 2013; Schunk & Usher, 2013). Strategies, such as MSR and ER, were recently highlighted in a meta-analysis examining which SRL skills were correlated with academic achievement in a statistically significant way among postsecondary students (Broadbent & Poon, 2015).

Study Significance. This study examined and explored the relationships between SRL (e.g., overall SRL, MSR, ER), learner characteristics (e.g., higher/lower performing), and learner outcomes (e.g., satisfaction, GPA). Because SRL behaviors are so dependent upon context, relationships between these variables can look different outside of postsecondary populations (Cazan, 2014). While it is important to understand how to help postsecondary level students succeed academically in online settings, it is also important to help the rising number of secondary level students studying online (Tsai, Shen, & Fan, 2013).

Although quantitative methods are more often encountered in literature on SRL in online settings, this study utilized a mixed-methods approach. Not only did the mixed-methods approach add depth and richness to what is understood about the learner’s use of SRL strategies, but the qualitative methods helped corroborate several quantitative findings (Azevedo, 2009; Creswell & Plano Clark, 2011).

Several stakeholders may benefit from this study. Administrators, such as superintendents and principals of online secondary level institutions will be able to make informed decisions

about course format and technology needs. These leaders can implement systems that best promote the use of learning strategies that may enhance academic performance in students. In turn, course designers and high school teachers will be able integrate instruction on key SRL strategies, if instruction influences academic performance, and train students in acquiring these SRL skills. In higher education, findings from this study will hopefully add to the current body of research on SRL and academic performance in online settings within the secondary school population. Aside from possibly passing on research-based practices to preservice teachers heading into the classroom, researchers will be able to continue designing studies, whether quantitative, qualitative, or mixed-methods, to further explore the dimensions of SRL and determine whether or not there is a positive correlation between SRL and academic performance. If there is such a link, researchers can determine which interventions facilitate the use of SRL strategies.

Theoretical Overview

Based on Bandura's (1991) social cognitive theory, Zimmerman and Moylan's (2009) SRL cyclical model helps explain the myriad of relationships between the variables of overall SRL, MSR, ER, and academic performance. Also, a part of the conversation is learner performance and satisfaction.

Self-Regulated Learning. SRL is a potential antidote to poor academic achievement in online environments (Chmiliar, 2011). In the context of human development, self-regulations can be traced back to the 1960s and 1970s. However, by the mid-1980s, "...four largely separate bodies of historic research on cognition/metacognition, motivation, behavioral control, and developmental processes set the stage for the emergence of integrated research on self-regulation" (Boekaerts, Pintrich, & Zeidner, 2005, p. 4)." Barry Zimmerman (1986) can be

credited with developing an integrated definition of SRL, which examines the extent students are metacognitively, motivationally, and behaviorally active in their learning. In self-regulation theory, the focus...is on “*how* students personally activate, alter, and sustain their learning practices in specific contexts” (Zimmerman, 1986, p. 307). It is the self-directing mechanism by which learners convert their mental efforts into academic skills (Zimmerman, 2002). More precisely, SRL is defined as “the control that students have over their cognition, behaviour, emotions and motivation through the use of personal strategies to achieve the goals they have established” (Pandero & Alonso-Tapia, 2014, p. 450). Ultimately, SRL represents a shift in how student achievement has been investigated. Instead of focusing on student aptitudes, a teacher’s teaching abilities, or one’s environment--school or home, the role of the learner in the learning process is prioritized.

Zimmerman’s SRL Cyclical Model. Zimmerman’s cyclical phase model of self-regulated learning is widely recognized in literature (Pandero & Alonso-Tapia, 2014). His social cognitive model of SRL integrates motivational variables with metacognitive processes in three cyclical phases: forethought, performance, and self-reflection. The three phases operate on a constant feedback loop; there is not a prescribed order to follow. Therefore, the model is considered cyclical. Zimmerman’s 2003 model was slightly revised in 2009 (Figure 1), and basically includes more processes in the performance phase (e.g., interest incentives, self-consequences) (Pandero & Alonso-Tapia, 2014; Zimmerman & Campillo, 2003; Zimmerman & Moylan, 2009). The 2009 model is the point of reference for this study and may be referred to as Zimmerman’s SRL Cyclical Model (2009).

Figure 1. Phases and Processes of Self-regulation or SRL Cyclical Model

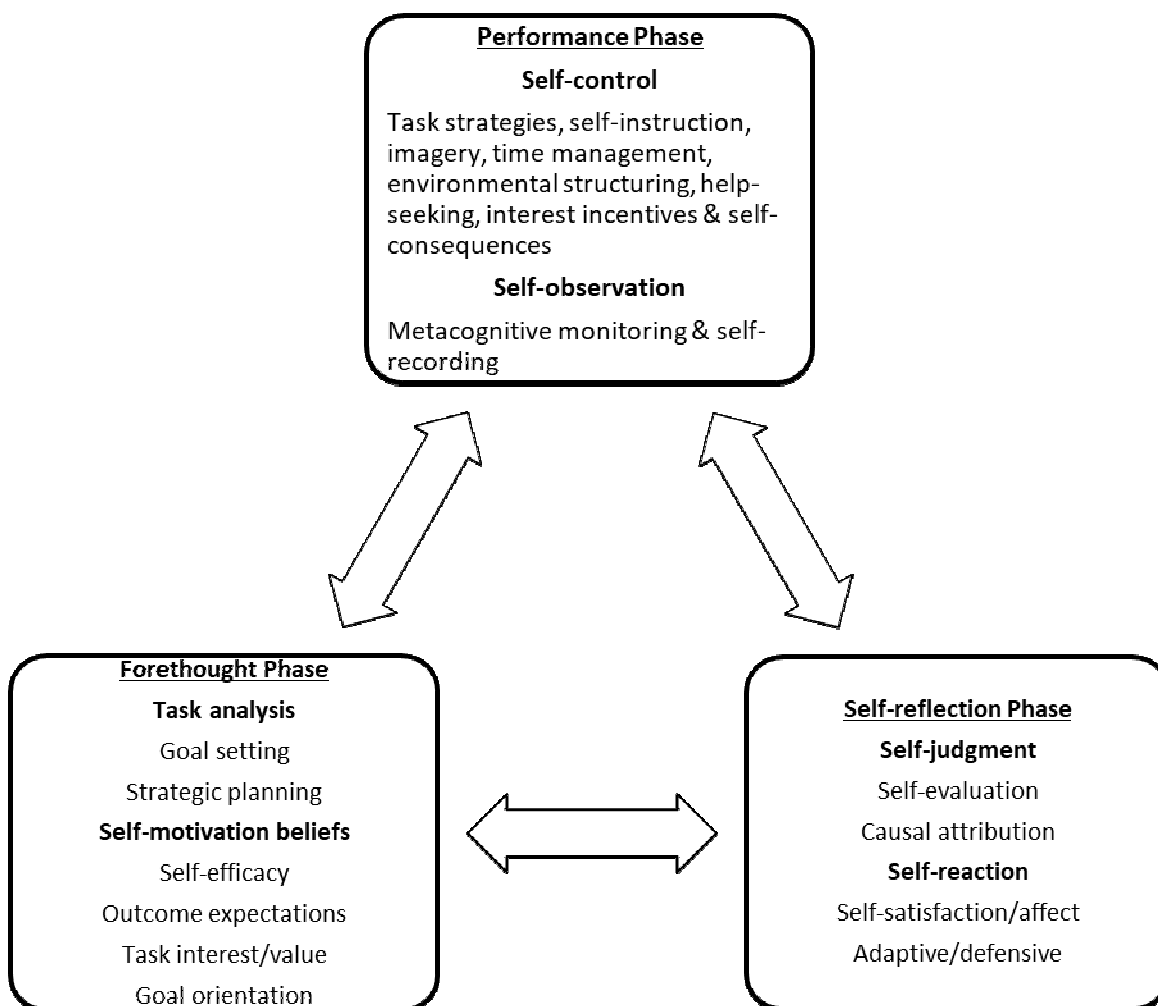


Figure 1. Phases and processes of self-regulation or SRL cyclical model. Republished with permission of Taylor and Francis Group LLC Books, from “Self-regulation: Where metacognition and motivation intersect,” by B.J. Zimmerman and A.R. Moylan, 2009; permission conveyed through Copyright Clearance Center, Inc.

In the forethought phase, the learner is assessing and determining what activities are essential to the completion of the task (e.g., task analysis). Goals are set and a plan is generated. Planning and goal-setting using a calendar or day planner could result in a learner blocking off a set amount of time for reading or completing homework. Informing the learner’s goals are motivational beliefs and expectations regarding the outcome of the task (e.g., self-efficacy, outcome expectations, etc.). If a learner believes spending extra time studying will increase their grade, they will allocate more hours to reviewing course materials prior to a test.

The performance phase is all about action; it includes the many actions a learner might take as they are working through a task. During the performance phase, a learner could construct an environment that best promotes learning, determine which cognitive strategies facilitate completion of an assignment and seek help from a peer, instructor, or tutor when they realize support is needed. In some cases, an incentive or consequence may be identified, which is related to effort regulation. The learner is steadily digesting content and monitoring their level of understanding or performance on a task.

Characterized by assessment, the self-reflection phase is comprised of an oscillating relationship between self-judgment and self-reaction. With self-judgment, a learner is assessing their performance. While their assessment may be connected to an external standard like a rubric, it is also tied to the learner's performance level goal. A score of 80 on an exam could be considered a favorable outcome, ultimately producing self-satisfaction. Conversely, the 80 could, in the mind of the learner, be the result of tutoring or even luck (e.g., causal attributes). Depending on their self-explanation for success or failure, there is an affective or cognitive reaction that also impacts whether the learner will exert effort or employ learning strategies moving forward (e.g., adaptive/defensive) (Pandero & Alonso-Tapia, 2014).

Metacognitive, behavioral, and motivational processes are dispersed throughout the phases of the Zimmerman and Moylan (2009) SRL model. Metacognitive processes can be identified across all three phases of the cyclical model, starting with the forethought phase. In the forethought phase, task analysis may be considered a metacognitive process. During task analysis, a learner may set goals and develop plans to breakdown assignments into smaller, more manageable pieces (e.g., goal setting and strategic planning). During the performance phase, a learner might determine whether they understand a concept. Reflecting on one's level of

comprehension is also considered a metacognitive process (e.g., metacognitive self-monitoring). Metacognitive processes are also evident in the self-reflection phase of Zimmerman and Moylan's SRL model (2009). For example, a learner may revise parts of their own research paper after reviewing an instructor's assignment rubric.

Behavioral processes are most prominent in the performance phase, where the learner exercises self-control. They can select and implement appropriate task strategies and even self-instruct. Choosing a quieter place to study and focus (e.g., environmental structuring) along with seeking the help of peers or an instructor are other behaviors associated with SRL. Behaviors are subsequently adjusted when the learner determines they are not receiving the desired outcomes (e.g., self-reflection phase).

Conversely, motivation is most evident in the forethought phase. Per Zimmerman and Moylan's (2009) SRL cyclical model, motivational beliefs like self-efficacy, outcome expectations, task interest/value, and goal orientation may impact the learner's use of time or task strategies. To elaborate, a learner who believes exerting more effort can yield higher grades will be more motivated to employ learning strategies, whether deep or surface processing. When faced with unsatisfactory learning outcomes (e.g., self-reflection phase), the learner can also become unmotivated and stop imposing self-consequences (e.g., performance phase).

Zimmerman and Moylan's (2009) SRL cyclical model forms the theoretical framework for this study. It helps explain how learners, inclusive of those in online learning environments, are metacognitively, behaviorally, and motivationally active in the knowledge acquisition process.

Literature Review

Most of what is known about SRL in online environments comes from the postsecondary level (Tsai et al., 2013). This literature review highlights outcomes and trends found in studies primarily conducted between 2010 and 2015 on SRL in online postsecondary settings. A synthesis of over a dozen journal articles also offers important definitions and descriptions of constructs that make up SRL and the variables in this study. An aim of this study is to potentially extend these findings to online courses at the secondary level.

Academic Performance. Self-regulated learning (SRL) has been identified as an underlying factor in countering the effects of poor academic achievement in online settings (Chmiliar, 2011). Recent studies indicate SRL is positively related to achievement for online courses or can enhance academic achievement outcomes (Barnard-Brak, Lan, & Paton, 2010; Cazan, 2014; Schunk, 2005). Depending on the study, academic performance may be defined as a grade on an assignment, a course grade, or one's grade point average (GPA) (Broadbent & Poon, 2015).

In SRL studies within online environments, learners have been classified by their level of academic performance. One correlational study showed there was a positive relationship between learner profiles as a self-regulator and academic outcomes, indicated by grade point average (GPA) (Barnard-Brak et al., 2010). For example, students classified as super self-regulators were more likely to have high GPAs although this positive correlation does not imply causation. While there may be a higher occurrence of use of SRL strategies among learners with higher GPAs, studies seek to determine which SRL strategies or collection of SRL strategies correlate with academic performance (Broadbent & Poon, 2015; Cho & Shen, 2013; Kim, Park, Cozart, & Lee, 2015).

Additionally, higher performers were more prompt in submitting assignments and outperformed lower performers when it came to goal setting (Lawanto, Santoso, Lawanto, & Goodridge, 2014b). Although higher performers were more likely to utilize strategies like goal setting, the lower performers reported higher scores on task strategies, time management, help-seeking, and self-evaluation (Lawanto et al., 2014b). Despite having some higher scores, there was a discrepancy in the behavior of the lower performers. Because lower performers fell behind higher performers in accessing course materials, study outcomes suggest lower performers may be overrating or misjudging their use of strategies (i.e., poor calibration) (Bol & Garner, 2011).

Another study on SRL and academic performance in online environments identified a positive correlation between task value and specific SRL skills (e.g. goal setting, task strategies, help-seeking and self-evaluation) (Lawanto, Santoso, Goodridge, and Lawanto, 2014a). Lawanto et al.'s (2014a) work combined with others on SRL and academic performance indicate a relationship between motivational beliefs or perceptions, (e.g., such as task value) and academic performance along with motivational beliefs and cognitive strategies (e.g., such as task strategies).

Other perceptions, such as various types of self-efficacy, are also discussed in SRL literature on academic performance in online environments. Self-efficacy theory, by definition, is “one’s convictions about her or his ability to perform a specific task at a designated level” (Cazan, 2014, p. 91). Aside from academic self-efficacy, a review of literature repeatedly encountered conversations about other types of self-efficacy levels related to the task of learning online. More specifically, self-efficacy was examined through the lens of one’s computer proficiency, ease with the Internet, and comfort level with technology (Cazan, 2014; Samruayruen, Enriquez, Natakatoong, & Samruayruen, 2013; Wang, Shannon, & Ross, 2013).

While Cazan (2014) determined online self-regulation and computer self-efficacy positively predicted end of course grades for the online courses, other researchers focused on the impact of Internet experience and its relationship with self-efficacy and use of cognitive strategy or the intersection of technology self-efficacy with motivational variables such as satisfaction (Samruayruen et al., 2013; Wang, 2013). Although higher levels of self-efficacy, regardless of the type, are not always properly calibrated, SRL research in online contexts suggest motivational beliefs, inclusive of self-efficacy and satisfaction, along with cognitive strategies are related to better academic performance in studies of SRL in online settings.

SRL Strategies. One's "ability to effectively employ self-regulation skills...[is] more critical in distance education environments than in traditional classrooms" (Bol & Garner, 2011, p. 105). Since use of SRL strategy is important in online environments, Rowe and Rafferty (2013) reviewed 11 studies on the use of self-regulated strategies online. They repeatedly cited the utility of teaching the SRL process and using learner prompts. Both strategies (e.g., teaching SRL and learner prompts) involve metacognition. Metacognition, along with effort regulation, are two variables significantly associated with academic achievement (Broadbent & Poon, 2015). Both variables, MSR and ER, combined provide insight into learner regulation (Kim et al., 2015).

Metacognitive Self-Regulation. In simplest terms, metacognition has been defined as cognition about cognition or thinking about thinking (Flavell, 1895; Martinez, 2010). However, the term "[m]etacognition has typically been conceptualized as involving one or more of the following aspects of a cognitive process: knowledge about that process, the monitoring of that process and control of that process" (Serra & Metcalfe, 2009, p. 278). MSR has been defined as "the management of cognition in learning activities" (Kim et al., 2015, p. 263). Additionally,

metacognitive regulation has been equated with control of one's cognitions (Pintrich, Smith, Garcia, & McKeachie, 1993). Although the terms MSR, metacognitive control, and metacognitive regulation could be considered synonymous, this particular dimension of metacognition is still informed by metacognitive knowledge and monitoring (Serra & Metcalfe, 2009). Thus, the broader construct of metacognitive regulation includes a student's "ability to plan, monitor, reflect, and adjust their learning process while studying learning materials" (Cho & Shen, 2013, p. 292).

In studies on SRL online, learner use of MSR has been compared across academic performance levels. For example, higher achieving undergraduate students tended to show more metacognitive regulation or MSR and higher degrees of satisfaction with online learning than their lower achieving peers (Cho & Shen, 2013). In a study of community college students, focusing on students enrolled in sections of developmental math, students in the treatment group had significantly higher final exam scores than those in the control group (Bol, Campbell, Perez, & Yen, 2016). Because the control group's scores in the Bol et al. (2016) study were below the average final exam score of the treatment group, the SRL training intervention may have helped explain the discrepancy in scores. Because MSR levels also improved for the treatment group, training in SRL can also be credited with impacting MSR in a positive manner (Bol et al., 2016).

MSR has also been recognized in SRL studies online for its mediating influence. More specifically, intrinsic goal orientation and academic self-efficacy were positively associated with students' achievements when mediated by the three different types of regulation (e.g., MSR, ER, and interaction regulation) (Cho & Shen, 2013). Again MSR was paired with ER (as a mediator) to explain why MSR levels for high and low performers decreased over the course of a semester,

contradicting previous findings in the role of MSR in online learning (Broadbent & Poon, 2015; Kim et al., 2015).

Future directions in research on SRL involve the construct of MSR. The Cho and Shen (2013) study represents the broader base of studies more commonly highlighting the motivational components of SRL and academic performance. However, Artino (2007) calls for more research on how motivational components relate to student academic behaviors or strategy use, which includes MSR. Other areas to research are the mediating effect of ER on MSR or the combination of these two types of regulation, and the positive correlation between MSR and satisfaction (Kim et al., 2015; Puzziferro, 2008).

Effort Regulation. Managing both cognition (i.e. metacognitive regulation) and effort (i.e. effort regulation) is necessary in learning because it transforms motivation to engagement in a learning task (Pintrich et al., 1993). Although a learner determines what they will study and which cognitive operations they will use, they must still investigate their effort in learning activities despite encountering difficulties (i.e. effort regulation) (Kim et al., 2015).

In Kim et al.'s (2015) recent study, researchers discovered differences in motivation and regulation across performance levels in an online self-paced asynchronous high school mathematics course. Outcomes from the Kim et al. (2015) study indicate higher performers started off the semester with higher effort regulation and were able to maintain this state. Therefore, Kim et al. (2015) concluded students exercising higher degrees of effort regulation enjoyed higher academic performance levels. These findings were corroborated by Puzziferro (2008) at the postsecondary level when ER was significantly related to final course grades among community college students learning online. Similarly, ER paired with time spent on

Blackboard among undergraduates in an asynchronous course predicted academic achievement (Cho & Shen, 2013).

ER is recognized for its bridging effects in SRL research in online settings (Kim et al., 2015). Results show “the goal orientation and academic self-efficacy positively associated with students’ achievements are mediated by ER, MSR, and interaction regulation” (Cho & Shen, 2013, p. 296). ER was also considered a mediating factor in the relationship of self-efficacy and GPA (Komarraju & Nadler, 2013). Through hierarchical multiple regression analysis, Komarraju and Nadler (2013) determined self-efficacy, ER, and help-seeking predicted 18% of the variance in GPA. The more self-efficacious students pursued mastery and performance goals through more closely monitoring and self-regulating impulses and persisted in the face of challenge (Komarraju & Nadler, 2013).

Looking at the effects of volition support through a virtual change agent on motivation, ER, performance, and perceptions indicate social presence has an impact on ER in online settings (Kim & Bennekin, 2016). Through concurrent triangulation mixed-methods, undergraduates in an online math course demonstrated higher ER and performance when provided with the intervention of a virtual change agent prompting them to regulate effort in managing resources (Kim & Bennekin, 2016). Kim and Bennekin’s (2016) study also illustrated the utility of mixed-methods research methodology in studying ER and learning outcomes like satisfaction in online coursework.

Purpose Statement

Based on a review of literature in SRL in online settings, there is a need for more studies identifying which self-regulation skills are most critical to student performance online (Kitsantas et al., 2013; Schunk & Usher, 2013). In response to this call, this study examined two SRL

variables, MSR and ER, due to their positive correlation with academic performance in recent studies (Broadbent & Poon, 2015; Cho & Shen, 2013; Kim et al., 2015;). This study extended literature findings on MSR and ER along with overall SRL and the relationships between these variables and academic performance to the context of online high schools (Broadbent & Poon, 2015; Cho & Shen, 2013; Kim et al., 2015). Similar to existing studies, this study also focused on higher and lower performing students and those who are satisfied or dissatisfied with their online course experience. However, the dimensions of performance level and satisfaction were examined for recent graduates of an online high school. Aside from adding to the growing body of knowledge about the use of study strategies and academic performance across select learner characteristics in online environments, this study fills a gap in literature on SRL for students in online high schools.

Research Questions

The research questions addressed in this study were:

1. What is the relationship between overall SRL and academic performance for graduates of an online high school?
2. What are the differences in reported use of MSR and ER strategies among higher performing and lower performing graduates of an online high school?
3. What is the relationship between overall SRL and satisfaction for recent graduates of an online high school?
4. What are the differences in MSR and ER between recent graduates of an online high school who are satisfied versus dissatisfied with their experience learning online?

CHAPTER II

METHODOLOGY

In the methodology section, the research design is presented. Participant demographics are given. Then, details regarding quantitative and qualitative measures, including overviews of instruments and study procedures are shared. Finally, quantitative and qualitative data analysis approaches are outlined.

Research Design

This study followed a multiphase mixed-methods design, starting with a convergent design, where responses to open- and closed-ended questions were collected simultaneously via an 80-item questionnaire (Creswell & Plano Clark, 2011). Then, another round of qualitative data was collected via follow-up interviews. The quantitative and qualitative data were analyzed separately, and results were later merged. Quantitative methods were used to address all research questions. Qualitative methods were also used to provide a deeper contextual understanding of these variables and to potentially corroborate quantitative findings.

Variables. Aside from participant demographics, quantitative measures of overall SRL, MSR, ER, academic performance (e.g., cumulative GPA), and satisfaction were used to test social cognitive theory within the context of a prominent SRL model. Conversely, the qualitative data garnered from the open-ended questions in an 80-item questionnaire and follow-up interview responses provided insight into the use of SRL strategies like MSR and ER among participants.

Participants

Survey data from 102 online high school graduates were collected. This study used a convenience sample comprised of online secondary programs willing to promote the study.

Prospective online programs, from a directory, were contact with a request to circulate an invitation to participate in the study. Purposeful sampling was also utilized during the collection of qualitative data from this homogeneous group to corroborate quantitative findings and more fully understand the online learning experience of participants (Hays & Singh, 2012). All participants in this study graduated from an online high school between 2016 and June 2017. Online high schools often offer the flexibility of graduating at any point in the calendar year once they meet state and/or institutional requirements. All participants were 18 or older.

Most participants were male ($N = 55$, 53.8%). The majority of the students considered themselves White/Caucasian ($N = 59$) or Black/African American ($N = 21$). Around 16% of the participants were Asian ($N = 9$, 8.8%) or Hispanic ($N = 8$, 7.8%). Over 60% ($N = 71$ or 68%) of the participants were enrolled in some type of postsecondary level institutions (two or four year); this is consistent with graduation statistics from traditional public high schools (U.S. Department of Education, National Center for Educational Statistics, 2016). There was almost an even split between the number of proficient ($N = 37$ or 36.3%) and experienced ($N = 34$ or 33.3%) online learners. A proficient online learner was defined as one with six or more courses completed online; an experienced online learner was defined as one with three to five courses completed online. In this study, the reason most learners chose to study online was to access advanced courses or to work ahead ($N = 40$, 39.2%), followed by a stronger academic alternative to local school options ($N = 25$, 24.5%).

Ten of the 102 participated in a follow-up interview via phone or email. Three interviews were conducted by phone and seven via email. Most participants were female ($N = 7$) versus male ($N = 3$) and Caucasian ($N = 8$). One participant identified as Black ($N = 1$) and one as Hispanic ($N = 1$). Driven by participant responses, most ($N = 7$) were in the lower performing

group, with a GPA less than 3.49. Many of the participants ($N = 7$) indicated they were satisfied with their online learning experience. Most participants were experienced ($N = 5$) or proficient ($N = 4$) as online learners. One participant ($N = 1$) was a novice. Half of the interviewees ($N = 5$) are currently enrolled in a 4-year postsecondary level institution with only one enrolled at a 2-year college. Four reported their current educational status as enrolled in a job training program or career/trade school.

Measures

Quantitative Measures. Measures of overall SRL, the select SRL strategies of MSR and ER, and academic performance were examined in this study. Overall SRL was determined by outcomes from the Online Self-Regulated Learning Questionnaire or OSLQ (Barnard, Lan, To, Paton, & Lai, 2009). MSR and ER values were taken from the MSR and ER subscales from a modified version of Pintrich, Smith, Garcia, and McKeachie's (1991) Motivational Strategies and Learning Questionnaire or MSLQ used by Mao and Peck (2013). Academic performance was operationalized as final high school grade point average (GPA) and reported on a 4.0 scale.

Additional variables in this study were performance level and satisfaction. Learners were categorized as higher performing or lower performing based on a median split of GPAs, with a dividing point of 3.49. Student satisfaction levels were based on outcomes from the Course Satisfaction Questionnaire (CSQ) (Faul, Frey, & Barber, 2004). A median split among satisfaction scores determine whether a learner was satisfied with their most recently completed online course experience; the dividing point for satisfaction level was 5.14. Median is a much more accurate representation of central tendency than mean for distributions likely to skew, like GPA or income (Sprinthall, 2012).

Test items from three instruments were combined with demographic and supplemental information in an online survey. The 80-item survey took approximately 10 to 20 minutes to complete.

Demographic and Supplemental Information. Participants reported demographic information (e.g., gender, race, age, level of experience with online course, current educational status, etc.). Their email address was collected and verified for electronic delivery of an Amazon.com or Starbucks' gift card for their participation. However, this contact information was removed prior to data analysis. All demographic items collected in this study are outlined in Appendix A.

Overall SRL. SRL is often measured by one of two tools, Pintrich et al.'s (1991) MSLQ or the OSLQ (Barnard et al., 2009). Brusio and Stefaniak (2016) recently determined neither of these SRL tools are better predictors of academic success. Both are used widespread and geared to college students; however, the context of the study may dictate which tool is best to use. For example, the shorter length of the OSLQ may yield higher survey completion rates, especially among recent secondary level graduates who studied online. However, the MSLQ lends itself to measuring specific scales like MSR and ER.

In this study, participants responded to 24 questions taken from the OSLQ (Barnard et al., 2009). The OSLQ (Appendix B) is comprised of six subscales: environmental structuring; task strategies, goal setting; help-seeking; time management; and self-evaluation. Each question has a 5-point Likert-type response with values ranging from strongly agree (5) to strongly disagree (1). The average of all subscales provides a measure of overall SRL. Higher scores by students on the OSLQ indicate better self-regulation in online learning. Prior studies reported Cronbach's alpha reliability coefficient (or Cronbach's alpha) of .90 for the overall tool to values ranging from .67

to .90 for the subscales (Barnard et al., 2009). For this study, the Cronbach's alpha was very similar at .91. Results from a study conducted by Barnard et al. (2009) presented evidence towards construct validity of the OSLQ with respect to students enrolled in a blended course and an online course format.

MSR and ER. Two subscales from the MSLQ (Pintrich, et al., 1993) were included in the online survey. The MSLQ is a self-report survey designed to assess college student motivational orientations and use of different learning strategies for a college course (Pintrich et al., 1993, p. 801). This longer measurement tool, comprised of 81 items, could take as long as 30 minutes to administer. It is scored on a 7-point Likert-type scale, from 1 (not at all true of me) to 7 (very true of me). Only two subscales of MSR and ER from its learning strategies section were used to more carefully examine regulation strategies and to minimize attrition during the survey response process. Fortunately, the MSLQ's 15 modular scales may be used singly (Duncan & McKeachie, 2005; Pintrich et al., 1993). The MSR subscale includes items 33 (scale reversed), 36, 41, 44, 54, 55, 56, 57 (scale reversed), 61, 76, 78, and 79. ER is comprised of the following items: 37 (scale reversed), 48, 60, and 74. MSR and ER subscale items are in Appendix C.

A modified version of the MSLQ tool, recommended by Mao and Peck (2013), was used with recent graduates of an online high school based on their final high school GPA. The modified version of the MSLQ adapts test items 33, 42, 46, 47, 50, 53, 63, 67, 68, 69, 73, 79, and 81 in order to tailor its use to online courses. Ultimately, the only items modified on the MSLQ for this study were items 33 and 79, both on the MSR subscale.

The reported values of reliability on the original MSLQ were .62 to .93 on the motivational scale and .70 for most learning strategies subscales (Pintrich et al., 1993). Similarly, Cronbach's alpha for the subcategories of the motivation scale for the modified MSLQ (Mao &

Peck, 2013) fell between .61 and .91. The modified MSLQ coefficient alphas for the subscales of the learning strategies ranged from .66 to .81, which did not vary much from the original MSLQ coefficient alphas. In this study, the Cronbach's alpha for the MSR and ER subscales were .74 and .76 respectively. While these values demonstrate a fair amount of internal consistency, Thorndike and Thorndike-Christ (2010) ultimately encourages values of .80 and higher. Nevertheless, Pintrich et al. (1993) concluded, "The MSLQ seems to represent a useful, reliable, and valid means for assessing college students' motivation and use of learning skills," an assessment also applicable to the modified MSLQ (p. 812). Validity generalization is also an important part of the conversation about measurement tools (Thorndike & Thorndike-Christ, 2010). Pintrich et al. (1993) addressed the concept of validity generalization by explaining how the MSLQ is a predictor of course grade; however, its relationship to other variables is not known. The manual for the original MSLQ simply encourages the development of local norms by instructor, course, or institution.

Satisfaction. The online survey included items from the Course Satisfaction Questionnaire or CSQ (Faul, et al., 2004). This 21-item tool, located in Appendix D, captures satisfaction levels of students with the different aspects of a course. It is scored on a 7-point Likert-type scale, from 1 (completely dissatisfied) to 7 (completely satisfied). This tool has been used in both a traditional course and one using web-assisted technology (Faul et al., 2004). The flexibility of this tool suggests it may be used in online settings without a need for modifications. "Preliminary tests on the psychometric characteristics of the CSQ shows an excellent reliability coefficient of .97" (Faul et al., 2004, p. 110). Computed for this study, the Cronbach's alpha for the CSQ was .93.

Qualitative Measures of SRL. Another perspective on the overall use of SRL and the specific SRL strategies of MSR and ER was collected using open-ended questions to corroborate quantitative findings and more fully understand participant experience. Appendix E includes questions adapted from Zimmerman and Martinez-Pons' (1988) Self-Regulated Learning Interview Schedule (SRLIS). The original measurement tool consists of structured interview questions that present students with six problem contexts, such as writing a paper or completing homework (Zimmerman & Pons, 1986). Typically, responses are coded into 15 self-regulatory categories that focus on motivation, metacognition, or behavior by frequency. Then, learners also rate their consistency in using a particular strategy using a 4-point scale that ranged from seldom to most of the time (Zimmerman, 2008). In this study, responses about strategies were coded a priori, using 15 strategy labels from Zimmerman and Pons' (1986) work and grouped by strategies across performance and satisfaction levels, focusing on MSR and ER. A limited number of emergent codes were assigned to responses. The study was amended with the researcher's Institutional Review Board (IRB) and an interview protocol was added (See Appendix H). Interview responses were coded in the same manner as the open-ended responses, using the 15 strategy labels from Zimmerman and Pons (1986) as a priori codes and a limited number of emergent codes. Codes for interview responses were grouped by strategies and across performance and satisfaction levels, focusing on MSR and ER.

Procedure

Following approval from the IRB, the researcher notified a university-based online high school superintendent in the Southwest. The researcher forwarded the text of an email invitation (Appendix F) to the university-based online high school's administrative staff member, copying the superintendent. The online high school administrative staff member forwarded this email on

behalf of the researcher to Class of 2016 and 2017 online high school graduates. The email was sent to any Class of 2016 and Class of 2017 students who were at least 18 or older at the time of the message. The researcher was included in this email. The researcher provided a brief explanation of the study, addressed the issue of anonymity and confidentiality, and described data management plans with the email invitation to participate in the study. An informed consent form was provided to participants opting to participate in follow-up interviews. (See Appendix I.) Within the email invitation was a link to the online survey. To help minimize the high dropout rates associated with research conducted online, the participants were furnished with an approximate time for survey completion (Sternberg & Sternberg, 2010). Initially it was communicated the survey would take approximately 30 to 45 minutes based on the description of each scale; however, the time was adjusted when the researcher determined the participants were taking much less time based on the time recorded in the online survey. The 80-item survey took most participants 10 to 20 minutes to complete. The first email was ultimately sent June 2, 2017. A follow-up email was sent approximately two weeks later (June 19, 2017). The survey link was “live” no longer than three months.

Participants completing the survey through the first university-based online high school in the Southwest received an electronic gift card in the amount of \$5 from their choice of Amazon or Starbuck’s. The gift cards were delivered to the email address provided to the researcher in the online survey. Gift cards were delivered via email to eligible participants once a week. Incomplete responses were not eligible for the gift card incentive. This was also stated in the online survey.

Due to low participation rates, the researcher consulted with dissertation committee members, conducted a statistical power analysis, and submitted an amendment to IRB to broaden

data collection methods. Broadening the pool of participants resulted in the researcher updating demographic survey questions to capture information from other online high schools (e.g., questions 2, 5, 10, 11, 12 in Appendix A). The researcher also contacted other public and private university-based online high school administrators. These secondary-level administrators were asked via phone and email to either email their recent graduates or to share the researcher's invitation to participate in the study via social media (e.g., Facebook pages, Twitter, or Instagram) using the content of Appendix G as a guide. When possible, open records requests were placed with the university to determine which of their matriculated students graduated from their university-based online high school. Top ranked online schools, not affiliated with a university, were also be contacted with a request to send an email blast or post on their social media platforms. The survey link was also circulated to homeschool organizations with the aim of identifying online high school graduates. Ad campaigns on social media platforms such as Google, Twitter, and Facebook were also leveraged to reach online high school graduates. The dissertation chair and doctoral researcher also posted on their social media platforms and through their network (e.g., ODU doctoral student with over 1000 connections). The financial incentive was ultimately increased from \$5 to \$10 to \$20 and finally \$25 to encourage participation.

Interviews were collected via a phone or email to add rich, descriptive data. See Appendix H for the interview protocol for phone versus email interviews along with interview questions and probes. Ten interviews were conducted, three via phone and seven via email. The phone interview ranged from 15 to 25 minutes in length. During the phone interview, the researcher typed participant responses in an email. Following the interview, the researcher forwarded these responses for member checking. Updates were made to responses based on participant feedback. Then, the researcher confirmed entry into a drawing for a tablet. A \$10

Amazon gift card incentive was later offered to encourage completion of email interviews. After the researcher reviewed emails to determine whether any follow-up questions were necessary, an electronic \$10 Amazon gift card was issued to participants along with entry into a drawing for a tablet. Once the interviewing concluded, the researcher conducted a random drawing for the tablet and shipped the tablet to the winner of the drawing.

Data Analysis

De-identified data (e.g., participant email addresses removed) was cleaned and analyzed via SPSS statistical software and qualitative themes were coded to determine responses to each research question. An overview of quantitative data analysis approaches for research questions 1 to 4 is outlined below in Table 1. The qualitative analysis section explains how the researcher sought to understand participant experience in an online setting at the secondary level and determined the level of corroboration between qualitative and quantitative data.

Table 1.

<i>Quantitative Data Analysis by Research Question</i>		
Research Question	Variables	Data Analysis
1. What is the relationship between overall SRL and academic performance for graduates of an online high school?	Overall SRL, Academic performance	Quantitative Methods: Pearson Product-Moment Correlation (or Pearson's r correlation)
2. What are the differences in reported use of MSR and ER strategies among higher performing and lower performing graduates of an online high school?	MSR, ER; Higher Performing, Lower Performing	Quantitative Methods: MANOVA
3. What is the relationship	Overall SRL,	Quantitative Methods:

	between overall SRL and satisfaction for graduates of an online high school?	Satisfaction	Pearson's r correlation
4.	What are the differences in MSR and ER between recent graduates of an online high school who are satisfied versus dissatisfied with their experience learning online?	MSR, ER; Satisfied vs. Dissatisfied (median split)	Quantitative Methods: MANOVA

Quantitative Analysis. The data is comprised of 102 survey responses from recent online high school graduates. In an online survey, participants provided demographic information ranging from age, gender, and ethnicity to GPA, experience level with online coursework, current educational status, and more. Participants completed the OSLQ, the ER and MSR subscales of the Modified MSLQ, and a course satisfaction questionnaire (CSQ).

After survey outcomes were exported into Microsoft Excel, the researcher precleaned the data, removing duplicate and incomplete entries, condensing the fields and adding labels. Data cleaning procedures (e.g., recoding variables, identifying outliers or extreme values using boxplots) continued when the data was exported to SPSS.

Because the data set was over 50, a visual inspection of graphical methods, such as boxplots, were utilized to assess normality (Laerd, 2015). The distributions of all scales indicated a negative skew, with the ER scale most closely approximating normality. Once normality was determined, Pearson's r correlations were run for research questions 1 and 3. Boxplots also helped determine whether assumptions were met for statistical tests like MANOVA. Fortunately,

statistical tests like MANOVA are robust to deviations from normality so the researcher could proceed with data analysis (Laerd, 2015) for research questions 2 and 4.

Qualitative Analysis. Qualitative data was systematically analyzed following a prescribed coding process. Furthermore, validity considerations were also addressed.

Coding process. All qualitative data were coded using a priori coding using the 15 strategies outlined in Zimmerman & Pons' 1986 study and a limited number of emergent codes. See Table 2 for a list of a priori codes. Actions, processes, and thoughts were coded by the researcher seeking to understand their experience. Text was analyzed on a line-by-line basis.

Although most coding was deductive, a few codes emerged through inductive methods, through a constant comparative process. More specifically, the two broader codes of MSR_monitoring and ER were added. MSR_monitoring captured participant reports of reading out loud to stay focused and understand what they were reading. Ultimately, MSR_monitoring was coded as MSR. The ER code enveloped participant reports of “pushing or powering through” material for which they were disinterested. The ER code was also assigned to participants who tried to find something interesting about boring content or tried to make learning a game to maintain engagement with the material.

Table 2.

A Priori Codes for Self-Regulated Learning Strategies

Categories of Strategies	Definitions
Self-evaluation	Statements indicating student-initiated evaluations of the quality or progress of their work, e.g., "I check over my work to make sure I did it right."
Organizing and transforming	Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning, e.g., "I make an outline

	before I write my paper."
Goal-setting and planning	Statements indicating student setting of educational goals or subgoals and planning for sequencing, timing, and completing activities related to those goals, e.g., "First, I start studying two weeks before exams, and I pace myself."
Seeking information	Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment, e.g., "Before beginning to write the paper, I go to the library to get as much information as possible concerning the topic."
Keeping records and monitoring	Statements indicating student-initiated efforts to record events or results, e.g., "I took notes of the class discussion." "I kept a list of the words I got wrong."
Environmental structuring	Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier, e.g., "I isolate myself from anything that distracts me." "I turned off the radio so I can concentrate on what I am doing."
Self-consequences	Statements indicating student arrangement or imagination of rewards or punishment for success or failure, e.g., "If I do well on a test, I treat myself to a movie."
Rehearsing and memorizing	Statements indicating student-initiated efforts to memorize material by overt or covert practice, e.g., "In preparing for a math test, I keep writing the formula down until I remember it."
Seeking social assistance_peers	Statements indicating student-initiated efforts to solicit help from peers, e.g., "If I have problems with math assignments, I ask a friend to help."
Seeking social assistance_teachers	Statements indicating student-initiated efforts to solicit help from teachers, e.g., "If I have problems with math assignments, I ask a

	teacher to help."
Seeking social assistance_adults	Statements indicating student-initiated efforts to solicit help from adults, e.g., "If I have problems with math assignments, I ask a parent to help."
Reviewing records_tests	Statements indicating student-initiated efforts to reread tests to prepare for class or further testing, e.g., "When preparing for a test, I review past exams."
Reviewing records_notes	Statements indicating student-initiated efforts to reread notes to prepare for class or further testing, e.g., "When preparing for a test, I review my notes."
Reviewing records_textbooks	Statements indicating student-initiated efforts to reread textbooks to prepare for class or further testing, e.g., "When preparing for a test, I review my textbook."
Other	Statements indicating learning behavior that is initiated by other persons such as teachers or parents, and all unclear verbal responses, e.g., "I just do what the teacher says."

Note. Taken from Zimmerman and Pons (1986).

Next, the 17 codes (15 a priori and 2 emergent) were collapsed into five codes based on the categories of learning strategies in the MSLQ. Table 3 illustrates the progression of the initial code to the final code.

Table 3.

Progression from Initial Code to Final Code

Initial Code	MSLQ Learning Strategies Framework	Final Code
Self-evaluation	Metacognitive-monitoring	MSR
Organizing and transforming	Cognitive-organizing or critical thinking	Cognitive
Goal-setting and planning	Metacognitive-planning or Resource Management-	MSR

Seeking information	managing time Resource Management-help seeking	Resource Management
Keeping records and monitoring	Metacognitive-monitoring	MSR
Environmental structuring	Resource Management-managing studying environment	ER
Self-consequences	Resource Management-effort management	ER
Rehearsing and memorizing	Cognitive-rehearsal	Cognitive
Seeking social assistance_peers	Resource Management-peer learning	Resource Management
Seeking social assistance_teachers	Resource Management-help seeking	Resource Management
Seeking social assistance_adults	Resource Management-help seeking	Resource Management
Reviewing records_tests	Metacognitive-monitoring	MSR
Reviewing records_notes	Metacognitive-monitoring	MSR
Reviewing records_textbooks	Metacognitive-monitoring	MSR
Other	N/A	Other
MSR_monitoring	Metacognitive-monitoring	MSR
ER	Resource Management-effort management	ER

Note. MSLQ Learning Strategies Framework adapted from Pintrich, et al. (1993).

A frequency count of the top three to four codes for each open-ended response from the questionnaire was tallied by performance and satisfaction level for open-ended questions one through six. With each code representing a specific SRL strategy, the outcomes of all six open-ended questions from the questionnaire were merged into one table reflecting SRL use by academic performance. MSR and ER were explored across academic performance levels using

qualitative data. A second table tabulated SRL use by satisfaction level. To determine the level of corroboration between open-ended responses from a questionnaire and the quantitative data, the researcher highlighted MSR and ER frequencies.

Similarly, responses from ten follow-up interviews were coded using a priori and emergent codes. Frequency counts of SRL were summarized using the final coding scheme for all participants by satisfaction level. Since the satisfied ($N = 7$) and dissatisfied ($N = 3$) groups were uneven, the researcher examined SRL strategy use in each group by percentage. Additionally, key themes related to satisfaction and dissatisfaction were highlighted from participant interviews to further explore the relationship between overall SRL and satisfaction and (in research question 3) to address degree of corroboration between qualitative and quantitative data.

Validity. Collecting responses from open-ended questions and follow-up interviews (from approximately 10% of the sample) added more in-depth understanding of participants' experiences learning online and the relationship between academic performance and course satisfaction. It also added another layer of data collection for triangulation. Triangulation of data sources increased trustworthiness in this study. For example, interview responses corroborated all participant's placement in the high or low satisfaction group based on responses to closed-ended questions on an online survey (e.g., CSQ values). Because participants could type their own responses, the researcher was able to minimize bias and confirm authentic representation. Interview responses also provided more thick descriptions than the open-ended questions in the online survey. Member checking was integrated into the data collection process when participants reviewed a draft of their transcribed interview responses following phone interviews. Field notes and memos provided an opportunity for bracketing the researcher's own personal

experiences as an online learner and lessening bias. These notes were also taken during the coding process, to reflect upon a priori codes and identify emergent codes, and facilitate the data analysis process. Thus, validity and credibility were ensured through using several methods to increase trustworthiness: triangulation of data sources, minimizing bias, providing thick descriptions, use of member checking, and writing notes during the data collection and analysis process (Hays & Singh, 2012).

CHAPTER III

RESULTS

In this chapter, outliers are identified. Results from research questions 1 through 4 are presented. Qualitative response (e.g., open-ended responses from a questionnaire, follow-up interview responses) are reviewed. Qualitative themes regarding satisfaction from follow-up interviews are also summarized.

Outliers

The researcher identified two outliers for removal through the use of boxplots and scatterplots. While most participants completed 80 survey items in 10 to 20 minutes, case 94 completed the survey in 5 minutes 14 seconds. Ultimately, this data set was removed due to concerns regarding validity; the participant completed the quantitative part of the survey twice with different demographic responses. Case 94's incomplete response was discarded in the data precleaning process; however, their second attempt on the survey was also removed for data analysis. Case 96 indicated a GPA of 1.0, which was possibly a data entry error by the participant. The participant may have mistyped their response or tried to enter a grade for one course. Graduation from any secondary level school, online or brick and mortar, with a cumulative GPA of a 1.0 is unlikely.

Research Question 1: What is the relationship between overall SRL and academic performance for graduates of an online high school?

A Pearson's r correlation between overall SRL and academic performance was not significant, ($r = -.194, p = .050$). A scatterplot indicated there is not a strong relationship between recent online graduates' GPA and overall use of SRL strategies in online environments. A $R^2 = .036$ indicates a little over three percent of the variance in GPA is accounted for by the variance

in SRL strategies in online environments. This effect size is consistent with what is found in education research, where it is not uncommon for effect sizes to fall between four and nine percent (Ellis, 2010).

Research Question 2: What are the differences in reported use of MSR and ER Strategies among higher and lower performing graduates of an online high school?

A one-way multivariate analysis of variance (MANOVA) was conducted to determine whether there were differences in reported use of MSR and ER strategies among higher performing and lower performing graduates of an online high school. First, MANOVA test assumptions were verified. The assumptions of independence and random sampling were met. The assumption of normality was determined using boxplots. The assumption of homogeneity of covariance matrices was assessed using Box's M test. Because Box's M test was significant, $p = 0$, the assumption of homogeneity of covariance matrices was violated and Levene's test of homogeneity of variance was run. For the ER subscale, there was homogeneity of variance, as assessed by Levene's Test of Homogeneity of Variance ($p = .752$), but not for the MSR subscale $p = .008$. Because of the MSR subscale's violation, the researcher determined there would be a potentially lower level of statistical significance (α level) for MANOVA results.

The results of a one-way MANOVA were not statistically significant between low and high performing groups for the ER and MSR subscales, $F(2, 99) = 2.391$, $p = .097$; Wilks' $\Lambda = .954$; partial $\eta^2 = .046$. Although the ER mean for the higher performing group was higher ($M = 5.63$, $SD = 1.06$ versus $M = 5.29$, $SD = 1.09$), there was virtually no difference between the means. Similarly, there was not much of a difference in means for MSR between the higher GPA and lower GPA groups, ($M = 5.63$, $SD = 1.06$ and $M = 5.29$, $SD = 1.09$). In terms of effect size, only 4.6% of the variance in GPA can be explained by use of ER or MSR strategies.

Research Question 3: What is the relationship between overall SRL and satisfaction for recent graduates of an online high school?

A Pearson's r correlation between overall SRL and satisfaction yielded a strong relationship with significant findings, ($r = .669, p = 0$). A scatterplot of overall SRL and satisfaction showed CSQ scores rising with OSLQ scores. With a $R^2 = .447$, close to 45% of variance in satisfaction can be accounted for by the variance in SRL strategies among recent online graduates. The effect size is medium (Cohen, 1988). Although the correlation is strong, causation cannot be implied.

Research Question 4: What are the differences in MSR and ER between recent graduates of an online high school who are satisfied versus dissatisfied with their experience learning online?

Participants were assigned to the high satisfaction versus low satisfaction group based on a median split, using 5.14 as the dividing point. However, with the value of 5.14 appearing four times, the low and high performing groups were not equal, $n = 54$ for dissatisfied group, $n = 48$ for satisfied group.

To determine whether there were differences in reported use of MSR and ER strategies among participants with high versus low satisfaction, a one-way MANOVA was run. The assumptions of independence and random sampling were met. To assess normality visually, boxplots were examined. Because MANOVA is fairly robust to deviations from normality, the researcher was able to evaluate the sample for homogeneity of covariance matrices using Box's M test (Laerd, 2015). Box's M test was significant, $p = .001$ so the assumption of homogeneity of covariance matrices was violated. Levene's test of homogeneity of variance was subsequently

run and met for MSR ($p = .237$). The assumption of homogeneity of variance was not met for ER ($p = 0$), indicative of a lower level of statistical significance for MANOVA results.

The results of a one-way MANOVA were statistically significant between the low and high satisfaction groups for the ER and MSR subscales, $F(2, 99) = 14.12, p = 0$; Pillai's Trace = .222; partial $\eta^2 = .222$. To determine which dependent variable contributed to the statistically significant MANOVA, the results of a one-way ANOVA for ER and MSR were examined. There was a statistically significant difference in ER subscale scores between satisfaction levels, $F(1, 100) = 17.030, p = 0$; partial $\eta^2 = .146$ with a higher mean for the more satisfied group ($M = 5.90, SD = .74$) than the less satisfied group ($M = 5.07, SD = 1.20$). In terms of effect size, only 14.6% of the variance in ER can be explained by satisfaction level.

Additionally, there was a statistically significant difference in MSR subscale scores across satisfaction level, $F(1, 100) = 10.093, p = 0$; partial $\eta^2 = .170$ with a higher mean for the satisfied group ($M = 5.26, SD = .64$) than the dissatisfied group ($M = 4.63, SD = .75$). In terms of effect size, only 17.08% of the variance in MSR can be explained by satisfaction. Even after applying a Bonferroni correction, the p values remain very small, $p = 0$ and statistically significant. In summation, both ER and MSR scores were statistically significant across satisfaction levels with higher means in the higher satisfied group. For ER, the mean was higher for the participants highly satisfied with their final online course ($M = 5.90, SD = .74$) versus those with low satisfaction ($M = 5.07, SD = 1.20$). For MSR, the mean was higher for the group of participants classified as highly satisfied ($M = 5.26, SD = .64$) compared to the low satisfaction group ($M = 4.63, SD = .75$).

Qualitative and Quantitative Data Corroboration

To determine the degree qualitative data confirms or denies the findings in this study, open-ended responses from a questionnaire and follow-up interviews were analyzed.

Open-ended Responses on Questionnaire. Participants described how they completed various learning tasks. These responses were coded by use of SRL strategies. A frequency count of coded responses also provided insight into participant use of SRL strategies. Following sample responses to six open-ended questions from the 80-item questionnaire is Table 4, which summarizes SRL use in performance groups with a frequency count by strategy. Following Table 4 are responses to the same six open-ended questions by satisfaction level. Then, another table tallying overall SRL by satisfaction is included.

SRL Strategies by Academic Performance. Open-ended question 1 asked: How did you learn and remember course materials? In the higher and lower performance groups, cognitive and MSR strategies were largely reported. Cognitive strategies included use of rehearsing and memorizing or organizing and transforming. The following comments reflected use of cognitive strategies: “To remember course materials, I found that writing the questions/answers down onto notecards over and over again helped immensely” (e.g., rehearsing and memorizing) and “I later go and try to summarize each concept to make sure I understand” (e.g., organizing and transforming) when referring to online notes for the course or course materials. Use of MSR strategy was evident when a participant stated, “I would go over all my notes and reread my assignments after completing them” (e.g., reviewing records). Another MSR-related strategy response was: “When reading, [I] use a pen to record in the book” (e.g., keeping records and monitoring). Participants recorded very few references to ER for this learning task. Higher performing learners reported a higher frequency count of cognitive strategies such as rehearsing and memorizing ($N = 14$) and organizing and transforming ($N = 11$) than lower performing

learners ($N = 13$ and $N = 6$ respectively). Likewise, narrative regarding use of MSR strategies like reviewing records (N , higher performing = 28; N , lower performing = 12) and keeping recordings and monitoring (N , higher performing = 19; N , lower performing = 13) surfaced with greater frequency in the higher performing group.

In open-ended question 2, participants responded to the following: What steps did you follow to complete homework? Although MSR, ER, and resource management strategies were mentioned in interview question 2, use of MSR strategies surpassed ER (e.g., environmental structuring) and resource management (e.g., seeking information). MSR strategies included goal-setting and planning and reviewing records. Participants indicating use of goal-setting and planning remarked, “I made a schedule at the start of the class with all the due dates and keep it up to date” or “I would set aside one hour a day and just work on it.” Unspecified records were also reviewed prior to completing homework. Learners would “[f]irst review the knowledge, and then find the answer.” MSR was slightly higher for the low performing group (N , lower performing = 41; N , higher performing = 40). However, ER ($N = 5$) and resource management ($N = 5$) were slightly higher for the higher performing group than the lower performing group ($N = 4$ and $N = 3$ respectively).

Open-ended question 3 requested a description of participant approaches to writing papers. MSR, cognitive, resource management, and ER strategies were described by participants. Use of MSR through planning and self-evaluation coupled with cognitive strategy (e.g., organizing and transforming) was illustrated in this comment:

“When writing papers, I first think hard about the topic and then make an outline so I know exactly what I’m going to write about. Next, I sit down and write the paper. When

I'm done writing the paper, I proof read it a couple of times and make corrections before turning it in.”

Ultimately, higher performing students utilized MSR ($N = 26$) and ER ($N = 4$) strategies more often than lower performing students ($N = 25$ for MSR and $N = 0$ for ER).

Open-ended question 4 asked: How did you prepare for tests? Inquiring about test preparation primarily yielded responses that aligned with MSR use, namely reviewing records. Records ranged from quizzes and notes to study guides and flash cards. For example, one participant said: “When it came to final exams, I studied all of the course material again, as well as any notes I had taken during the class.” MSR use in the higher performing group ($N = 62$) exceeded the lower performing group ($N = 28$).

Open-ended question 5 sought to understand how participants completed assignments of no interest. Participants expressed the many ways they demonstrated effort regulation when faced with boring assignments or tasks for which there was little interest. “Powering through” and “seeking interest” along with self-consequences was most often reported. “I reward myself when I finish something I'm not interested in,” commented a participant. ER strategies occurred most frequently in the higher performing group ($N = 37$) when compared to the lower performing group ($N = 29$). Goal-setting was reported at a higher rate in the lower performing group ($N = 10$) than the higher performing group ($N = 6$).

When asked to describe one's most productive study session (e.g. open-ended question 6), participants from the lower and higher performing groups responded their environment most influenced productivity. “I like working on assignments alone in a quiet room,” declared one learner. Seeking social assistance (e.g., resource management), goal-setting (e.g., MSR) and reviewing records (e.g., MSR) followed ER strategy use. The lower performing group shared

about higher degrees of environmental structuring ($N = 48$) than the higher performing group ($N = 43$). Conversely, the higher performing group sought social assistance at a higher rate ($N = 18$) than the lower performing group ($N = 11$). Additionally, the higher performing group tended to review records ($N = 8$) more than the lower performing group ($N = 4$). Goal-setting was an exception; the lower performing group's reports of goal-setting ($N = 8$) exceed that of the higher performing group ($N = 6$).

MSR and ER by Academic Performance. Cumulative frequency counts for MSR and ER by academic performance levels are reported in Table 4. A summary of frequency counts for MSR and ER yielded larger values for the high performing group (MSR = 206, ER = 100) than the low performing group (MSR = 143, ER = 79). Reviewing records and goal-setting led other MSR strategies while environmental structuring and self-consequences edged out other ER strategies in the higher performing group. More specifically, the higher performing group ($N = 66$) exercised more use of reviewing records than the lower performing group ($N = 51$). Goal-setting; however, occurred more frequently in the lower performing group ($N = 68$) than the higher performing group ($N = 57$). Determining the ideal learning environment was considered more frequently among the participants in the higher performing group ($N = 59$) than the lower performing group ($N = 44$). Self-consequence strategies included responses delineating the cause and effect relationship between completing an assignment and the grade, being able to graduate from high school, and choosing to reward themselves for their efforts. Self-consequence was reported at a higher rate among higher performing participants ($N = 17$) than lower performing ($N = 12$).

Table 4.

Summary of SRL Frequency from Open-Ended Questionnaire Responses by Performance

SRL Strategy	High Performing	Low Performing
MSR	(206)	(143)
-Review records	66	51
-Keeping records and monitoring	24	16
-Goal setting	57	68
-Self-evaluation	19	8
ER	(100)	(79)
-Environmental structuring	59	44
-Power through/seeking interest	20	17
-Self-consequences	17	12

SRL Strategies by Satisfaction. Open-ended question 1 asked: How did you learn and remember course materials? Similar to the higher and lower performance group, participants who were satisfied with their final online course shared responses that pinpointed cognitive and MSR strategy use. Again, cognitive strategies like rehearsing and memorizing along with organizing and transforming prevailed. “I’ll put some content into song, sing it, and I’ll remember it soon” resounded a participant. Another learner mentioned a MSR strategy in their response: “...[I] took notes on topics I didn’t understand” (e.g., keeping records and monitoring). Very few comments connected to ER strategy use. Satisfied learners reported a higher frequency count for organizing and transforming ($N = 11$), a cognitive strategy than the dissatisfied group ($N = 6$). The cognitive strategy of rehearsing and memorizing was lower for the satisfied group ($N = 10$) than the dissatisfied group ($N = 17$). Likewise, dialogue regarding use of MSR strategies like reviewing records occurred with greater frequency in the satisfied group ($N = 22$

for satisfied, $N = 18$ for dissatisfied). However, participants cited more frequent use of keeping records and monitoring in the dissatisfied group ($N = 20$) compared to the satisfied group ($N = 12$).

Next, participants were asked in open-ended question 2: What steps did you take to follow and complete homework? Mirroring the higher and lower performance groups, comments from satisfied participants suggested use of MSR strategies over ER and resource management. One example of a statement describing goal-setting, a MSR strategy, was, "I just made a schedule for the week and made sure I did my homework when I was supposed to."

Environmental structuring, which falls on the ER continuum, followed MSR strategy use. For environmental structuring, participants sought out quiet locations, listened to music, or even grabbed snacks. Seeking information as a part of resource management typically included seeking social assistance or information. Reports of MSR (e.g., goal setting) was described by the dissatisfied group ($N = 36$) at a higher rate than the satisfied group ($N = 29$). ER strategies were more frequently reported for the satisfied group: environmental structuring ($N = 7$) versus the dissatisfied group ($N = 2$). Environmental structuring (e.g., resource management) was mentioned more often in the satisfied group ($N = 7$) than in the dissatisfied group ($N = 2$).

Then, participants described their approach to writing papers (e.g., open-ended question 3). For this question, participant responses corresponded most with use of MSR, cognitive, and resource management strategies. Few comments coincided with use of ER. For example, the following student reflection indicated use of seeking information (e.g. resource management) along with organizing and transforming (e.g., cognitive strategy): "Writing papers included a lot of research for the topic. I used to make a rough outline and then write the paper in a different word processing software before pasting it into the submission portal." The dissatisfied group

reported slightly higher frequencies for cognitive ($N = 20$ for dissatisfied versus $N = 18$ for satisfied) and resource management ($N = 23$ for dissatisfied versus $N = 22$ for satisfied) strategy use when writing a paper than the satisfied group. MSR use in the satisfied group ($N = 33$) slightly eclipsed the dissatisfied group ($N = 31$).

Fourth, participants wrote about the ways they prepare for tests (e.g., open-ended question 4). For test preparation, reviewing records, an MSR strategy, and environmental structuring, an ER strategy, was reported most often by participants. “I revisited all the quizzes, practice quizzes, and all my notes for the class,” a learner explained. Examples of environmental structuring included finding a quiet place to study, playing relaxing music while studying, and studying alone. The dissatisfied group described more practices related to MSR ($N = 48$) than the satisfied group ($N = 42$). However, the satisfied group ($N = 11$) relied more on environmental structuring (e.g., ER) than the dissatisfied group ($N = 5$).

Open-ended question 5 asked: How did you go about completing assignments of no interest to you? Participants most often tried the ER tactics of “pushing through” assignments of little interest to them and “searching for interest.” One “Found ways to make the material relate to me and my life” as they searched for interest. A third strategy was self-consequence followed by environmental structuring. The satisfied group used ER strategies at a higher rate ($N = 40$) than the dissatisfied group ($N = 35$). Use of goal-setting, a MSR strategy, in the satisfied group ($N = 10$) also surpassed goal-setting in the dissatisfied group ($N = 6$).

Finally, open-ended question 6 requested comments regarding what aspects of a study session made them most productive. Comments related to environmental structuring were repeatedly shared: “My most productive study sessions were when I listened to classical music with headphones,” “I took caffeine and listened to music,” or alternatively “I would go

somewhere like the library or Starbuck's so that I can sit and concentrate and study." Use of environmental structuring was inferred from the satisfied group ($N = 47$) at a higher level than the dissatisfied group ($N = 44$). Aside from environmental structuring, the satisfied group ($N = 16$) described seeking social assistance primarily from peers and friends than the dissatisfied group ($N = 13$). Therefore, ER was slightly higher for satisfied participants. MSR was less frequently reported in response to this question about productivity and occurred at lower levels in the satisfied group ($N = 5$) when compared to the dissatisfied group ($N = 9$).

MSR and ER by Satisfaction. Table 5 provides an overview of SRL frequency counts by strategy use across satisfaction levels. Cumulative frequency counts for MSR and ER by satisfaction levels resulted in larger values for the satisfied group (MSR = 153, ER = 105) when compared to the dissatisfied group (MSR = 148, ER = 86). Reviewing records and goal-setting again emerged as the leading MSR strategies with reviewing records happening more in satisfied participants ($N = 74$) than in the dissatisfied ($N = 69$). However, the dissatisfied group ($N = 66$) reported more frequent use of goal-setting strategies than the satisfied group ($N = 59$). Conversely, the ER strategies of environmental structuring, pushing through and searching for interest surpassed other ER strategies. The satisfied group ($N = 72$) referenced environmental structuring strategies more often than the dissatisfied group ($N = 53$). Pushing through and searching for interest, other broad ER strategies, was espoused by the satisfied group ($N = 21$) and less reported by the dissatisfied group ($N = 16$).

Table 5.

Summary of SRL Frequency from Open-Ended Questionnaire Responses by Satisfaction

SRL Strategy	Satisfied	Dissatisfied
MSR	(153)	(148)

-Review records	74	69
-Keeping records and monitoring	12	20
-Goal setting	59	66
-Self-evaluation	8	13
ER	(105)	(86)
-Environmental structuring	72	53
-Power through/seeking interest	21	16
-Self-consequences	12	17

Follow-up Interview Responses

MSR Strategies. MSR strategies were also assessed through interview questions and probes during phone and email interviews. These strategies spanned Zimmerman’s SRL Cyclical Model (2009).

Forethought phase. Comprised of task analysis and self-motivational beliefs, the forethought phase is most reflected in participant responses to question 5a: What role did goal-setting play in learning the new material? For one participant, defining the start and stop times for school work was a part of how they planned their day:

“As an online student, a typical day is very flexible. Get up 5:30 am to work on one subject. Then go to a practice. Come home and do 3 or 4 subjects before lunch. After lunch, complete the last two subjects...usually done by 3 or 4 pm.”

Back up plans were generated in the event of technology limitations for this same participant:

“I would bring computer to competitions and work assignments into schedule when travel. If I knew there was no Internet where I was competing, I would prepare in advance...the nice thing about online school is you can do school 7 days a week...can do school all day Saturday and Sunday before leaving for a competition if needed.”

Another participant also integrated elements of effort regulation, inclusive of environmental structuring (e.g., time of day) and self-consequence (e.g., time to ride horses) into their schedule:

“My typical school day. I'm not a morning person. I would start working on school like at 10 pm. So I would stay up until like 1 am doing my homework. I try to do a little bit every day for every class. It gave me time to ride horses and take care of them...and sit down and focus and do my homework.”

Performance phase. A combination of self-monitoring and self-control, the performance phase of Zimmerman's SRL Cyclical Model (2009) was evident in participant responses to interview question 5c: If you ever found your mind wandering (or confused) during studying, what did you do? Through self-monitoring (or metacognitive monitoring), participants were aware of their mind wandering and realized when they were confused. One participant stated, about their mind wandering: “That would happen to me a lot. I would totally forget what I just read.” Another participant reported: “If I caught myself, I would just start the paragraph over. I only had to do it. I had to trick my brain to focus.”

The second dimension of the performance phase, self-control, is how participants responded to the realization their mind was wandering or confused. While some would read aloud, one participant reported: “Either read faster or read for 20 minutes and then play on my phone 5 minutes.” Use of rewards (e.g., self-consequence) was a way to exercise self-control. Another participant anticipated mental distractions and simply pushed through them:

“It is natural for your mind to wander when you are studying especially when it is a subject that isn’t your favorite but I would typically just try and buckle down and focus. It is honestly something you just have to deal with and get past.”

Self-reflection phase. Participant comments regarding the self-reflection phase of Zimmerman’s SRL Cyclical Model (2009) were collected from questions 5d and 5e respectively: What is your thought process when you receive a graded test back? and What is your response to a low test grade? High test grade? One participant admitted to not reviewing graded tests:

“I never looked at the test because what was done was done. They usually gave a review so I studied that. Would I do that same approach now in college--probably not? Now I'm in college and you probably should study what you missed on a test.”

However, half of the participants replied they reviewed incorrect answers or tried to figure out why they missed a question. Most participants described their efforts in reviewing incorrect responses. For example, one participant shared:

“When I get back a question I missed I always try and figure out why I missed it so hopefully I don’t make that same mistake again because most teachers will use the same questions on other exams or homework later in the year.”

Less frequently reported was detailed teacher feedback regarding errors or opportunities for a second attempt to demonstrate knowledge:

“When I get graded assignments back, I review teacher comments at the end of the assignment. For each question, the teacher would write why I got it wrong. I would write down the questions I got wrong in my notebook so I would know it for the final exam. [The] teacher would often email us what we got wrong or give us an opportunity to retest. I would go back to my notes to see where I learned that information to try and figure out why I was confused on the test.”

While disappointment or happiness was expressed in response to low and high test grades respectively, one participant offered the following self-reaction:

“I try not to get too down or up about any one particular grade because classes tend to be more of a marathon than a sprint. One bad grade won’t kill you same as one good grade won’t make sure you pass. You honestly have to try your hardest each and every week.”

ER Strategies. ER strategies were assessed through interview questions with probes during phone and email interviews. Strategies described by participants most coincided with the performance phase of Zimmerman’s SRL Cyclical Model (2009). Participants reported self-monitoring and self-control strategies when they answered interview questions. Question 3a reflected self-monitoring strategies while question 3b explained how they exercised self-control (e.g., self-consequence).

As interviewees described an online course that was difficult for them, they elaborated on the aspect of the course that was most difficult for them (e.g., question 3a). Math and science courses were most often reported difficult. Geometry, Pre-Calculus, Trigonometry, Physical

Science, and Astronomy were specifically referenced in the interviews. Aside from the complexity of the content, one interviewee articulated the challenges of not receiving timely feedback in the following manner:

“I took Pre-Cal my senior year. That was definitely my most difficult course. Felt it was hard to ask questions...we had to email the teacher if there was a problem with a lesson. It was hard to get across in email what I was struggling with. What made it difficult: A combination of the material and not being able to see the teacher writing out the problems out in math. It would have helped a lot if I could see the teacher writing out the problems, step-by-step.”

To succeed in their Pre-Calculus course, the same participant outlined their efforts to mitigate challenges in their response to question 3b:

“[The] way I worked through this difficult situation: I had a white board in my room, where I would try to write out problems. I also read problems and instructions out loud. Sometimes I would read it out loud to my mom or have her read it to me to help me stay engaged.”

Therefore, cognitive strategies like reading aloud and rehearsal plus seeking social assistance seemed to help participants tackle difficult coursework.

Illustrations of self-control strategies emerged in the interviews as participants explained their response to course materials or assignments that were boring (question 4). The following participant outlined their approach to staying motivated (e.g., question 4a) and specific strategies used to complete their work (e.g., question 4b):

“When assignments are boring you really just have to power through them. I used several different strategies such as bribing myself with candy once I did so many problems, to reading out loud so that I could focus better, to having other people read to me, etc. Most courses were easy enough to stay concentrated on but when the odd one came along that wasn’t I would have to mix things up. Probably the best strategy is just taking breaks and detailed notes so that when you have a quiz or test that you don’t have to focus on the boring material just as much.”

Overall SRL Strategy Use. The performance phase of Zimmerman’s SRL Cyclical Model (2009) includes various strategies, ranging from MSR to cognitive and ER.

Performance Phase. Replies to interview question 5, When given new material to learn (e.g., a chapter or chapters on a new topic), describe the steps you followed to learn the material, portrayed use of various SRL strategies related to the performance phase. Strategies reflective of self-monitoring included a response stating the participant would “read through and highlight important information” (e.g., keeping records and monitoring) and “look ahead on assignments”. Another said, “I would read the whole chapter and highlight the main points. Then, I would write down what I highlighted, what I needed to remember in a notebook (and mark it Chapter 1, Chapter 2).”

Although goal-setting and planning involves some forethought, it also requires action. One response demonstrated the duality of this strategy: “Get a planner, look at all assignments due, over a week or two weeks. Write down how many chapters I want to read.” This was reiterated by another participant: “I broke it

down. I read this part of the chapter today...like 40 pages I would break into two days to make it easier to accomplish.”

Cognitive approaches like organizing and transforming or rehearsing and memorizing also surfaced in conversation. Participants created their own flash cards, wrote down definitions, “look[ed] back at flashcards and notes.” One even “cut the material into song with some software tools...[like] Adobe Premiere [Pro] CC”. “When I’m studying, rewriting my notes is my favorite method. It’s the most efficient for me,” stated another student.

Other SRL strategies described in response to interview question 5 included aspects of effort regulation. “In order to remember the materials, I’ll get up early and read aloud in a quiet environment,” stated one participant. While early morning study facilitated productivity for one, another shared listening to music while studying helped keep them focused (e.g., environmental structuring). Seeking social assistance from peers also aided participants. Meeting for group discussion and “play[ing] games to keep learning motivation” was mentioned by a participant. Throughout the interview, the same participants also reported “do[ing] homework with my friends” and often communicating with friends who are studying the same online course.

Student Satisfaction. Learner context and student satisfaction was assessed from interview questions 1 and 2 along with probes. (See Appendix H.) Question 1 primarily inquired about the catalyst for enrolling in an online high school and question 2 sought to understand their degree of satisfaction and dissatisfaction with various elements of their online course experience.

Since the satisfied ($N = 7$) and dissatisfied ($N = 3$) groups were uneven, their use of SRL was compared through percentages. In the satisfied group, MSR strategies were used 55% of the time while the dissatisfied group reported use of MSR 38.10% of the time. Higher percentages of cognitive strategies were cited in the satisfied group (11.25%) than in the dissatisfied group (2.38%). Conversely, the dissatisfied group relied more on resource management (33%) and effort regulation (26.19%) than their satisfied peers (18.75% and 15% respectively).

Themes Related to Satisfaction. Because quantitative findings indicated a statistically significant relationship between overall SRL and satisfaction and in the use of specific SRL strategies across satisfaction levels, themes related to satisfaction and dissatisfaction from follow-up interviews are explored.

Three main themes emerged from follow-up interviews regarding satisfaction with their online learning experience: flexibility and convenience, student-teacher interaction, and student-student interaction. Participants repeatedly mentioned the flexibility of learning online. For some, the flexibility allowed them to travel to complete in gymnastics and weightlifting or barrel races. Another could work as many as 45 hours a week while attending school. Being able to “work at my own pace” and “move on to another subject or with whatever else” or “enter school at any time” were reasons they enjoyed learning online.

Satisfied participants also described their interaction levels with teachers. “Communication between me and the teacher was really good” and cite examples of a teacher sending out reminders to get work done, offering feedback at the end of assignments, or emailing about opportunities to retest. One even stated, “The instructors pretty much responded to my questions almost immediately.”

Interaction with peers was frequently addressed. While some enrolled in online coursework at the recommendation of a friend, others already have online friends: “I’ve got some friends who study the same online course; we often communicate together.” Another viewed online courses an opportunity to “meet some interesting classmates” and “make a lot of friends.” Aside from friendships, peer to peer learning was sought out, sometimes in response to low course interaction: “I try to find learning skills from classmates.” Participants state group discussion is their favorite. Another said playing games [with peers] helped sustain their learning motivation.

Themes Related to Dissatisfaction. Two main themes surfaced during follow-up interviews regarding dissatisfaction with their online learning experience: student-content interaction (and quality of course materials) followed by student-teacher interaction. One student stated, “I thought it would be more interactive. You read the textbook and then answer the question. (All courses?) Every single one of them.” This learner also continued to say, “The one online college course I’ve had isn’t really interactive either so I guess that’s what you’re supposed to expect.” (At this point, the researcher recognized her bias and refrained from commenting on this expectation.) Another participant from the same institution said their course also lacked interaction. There was also a complaint about course materials being dated: “The teacher that I had for the course seemed like he just kind of recycled the videos from each year.” Another expressed an interest in a live voice reading PowerPoint slides over a computerized voice.

Participants complained of low teacher interaction and responsiveness. One con of learning online according to one learner is not having access to your instructor right way. This participant also said, “If I could change one thing I guess I would make it where teachers could

have more interaction with students. None of the teachers I ever had would do anything like a Skype call or something where you could really interact with them in real time.” Another was disappointed in the response time to emails: “Sometimes it would take four days to get a response. I would email...and then four days later, I don’t have that question anymore.”

CHAPTER IV

DISCUSSION AND CONCLUSIONS

The purpose of this study was to add to the body of knowledge regarding which self-regulation skills are most critical to student performance online and extend current findings to a new context, online high schools. This chapter interprets the results of the study as they relate to literature on SRL in online settings. In the concluding section, limitations and opportunities for future research are presented.

SRL and Academic Performance

In this study, the researcher examined the correlation between overall SRL and academic performance. Based on findings in literature, the researcher anticipated SRL to be positively related to achievement and/or that SRL would enhance achievement outcomes (Barnard-Brak et al., 2010; Cazan, 2014; Schunk, 2005). However, the outcomes of study indicate a negative and weak relationship between overall SRL taken from the OSLQ and academic performance using GPA.

Instead, the lack of a significant correlation could be possibly due to the restricted range for GPA or OSLQ score (Sprinthall, 2012). Examining a scatterplot of GPAs and OSLQ values suggests the sample may have been too homogeneous, meaning similar types of students may have participated in the study. The online high schools who chose to promote the survey may have been programs that attract students who prioritize flexible schedules to pursue other interests or commitments versus a magnet school for high achieving students. Qualitative data also indicated frequent reports of ER strategy use such as environmental structuring and self-consequence, especially in the higher performing and satisfaction groups. Use of external conditions may help explain why the financial incentive drew participants in this study. Thus, the

financial incentive may have attracted participants with similar profiles, ultimately leading to a more homogeneous sample. Another explanation for the negative correlation is the fitness of the instrument. All scales (e.g., OSLO, MSLQ subscales, CSQ) were created for postsecondary level students; however, in this study recent secondary level graduates completed these tools.

Participants may have misunderstood survey items. Additionally, survey outcomes could be the result of a learner using a limited number of SRL strategies due to ignorance or inexperience. In high school, tests tend to cover less content than in college, so learners may be able to memorize enough content to score well on a test without employing a number of SRL strategies. Therefore, the study results might not be appropriate to infer what could occur in the general population.

MSR, ER, and Academic Performance

Differences in the use of MSR and ER strategies in the higher performing and lower performing group were assessed in this study. Although the differences were not statistically significant, there were differences in means that coincided with what is found in literature. More specifically, learners with higher GPA were expected to use SRL strategies at a higher frequency (Barnard-Brak et al., 2010). ER and MSR combined have been positively correlated with academic performance in a previous study, and a correlation between ER and academic performance has been cited (Broadbent & Poon, 2015; Kim et al., 2015). Aligning with literature, open-ended responses to a questionnaire in this study indicated higher frequency for ER and MSR in the higher achieving group. This qualitative outcome opposed quantitative findings regarding MSR. Although the mean in this study was higher for ER among high GPAs, MSR was a little lower in this group, but virtually the same. Again, this could be related to the homogenous nature of the group or other potential explanations. The reverse scale items on the MSR could have also played a role in the lower values. Among the lower performers, the mean

for ER was higher than MSR, possibly due to “powering or pushing through,” which was repeatedly reported in open-ended questions. Surprisingly, the mean for MSR was higher in the lower performing group. This could be explained by participants reporting higher use of SRL strategies due to poor calibration or misjudging their use of strategies (Lawanto et al., 2014b). Although low performing participants in follow-up interviews spoke of the importance of goal-setting, their grades did not necessarily reflect the use of this strategy. The reports of lower performing participants align with literature, which state lower performers are overconfident and demonstrate poor calibration (Bol & Garner, 2011).

For either group, higher or lower performing, participants could benefit from more training in the use of SRL strategies and prompts to use these strategies. More specifically, training in SRL can positively impact MSR (Bol et al., 2016). While training “provides explicit instruction in the components of SRL such as cognition, metacognition, and motivation, prompts instruct students to stop and reflect on their own thoughts or consider the efficiency of their own learning strategies” (Rowe & Rafferty, 2013, p. 592). Examples of MSR training interventions and prompts include offering a goal setting exercise that encourages learners to set weekly academic goals, providing a good study habits checklist to promote self-monitoring and time management, or requiring a journal entry each week to teach self-reflection regarding their set goals (Bol et al., 2016). Since training and learner prompts have yielded successes in post-secondary e-learning environments, these interventions could extend to online learners at the secondary level (Bol et al., 2016; Rowe & Rafferty, 2013).

Overall SRL and Satisfaction

The correlation between overall SRL and satisfaction was examined in this study. Because satisfaction is related to persistence and student success, a positive correlation between

overall SRL and satisfaction was anticipated and confirmed by this study (Allen & Seaman, 2008; Hodges, 2008). The strong positive correlation indicates overall SRL use increases with satisfaction, as reported by the CSQ ($r = .669$). Since correlation does not imply causation, what is yet to be determined is whether the increase in SRL strategies increased the learner's satisfaction or were there other mediating factors. The outcome could be explained by mediating factors related to individual differences such as socioeconomic status, support from a parent or tutor, prior knowledge, or even demographics (Kim et al., 2015). For example, responses to open-ended questions in this study identified a range of supporters. While some sought assistance from their teacher or peers, others were able to reach out to a family member (e.g., parent) or access a tutor. Interviews also corroborated the role of a parent or tutor in the help-seeking process.

Data collected from interview responses offered further insight into the relationship between SRL and satisfaction. Satisfied participants relied more on internal methods of self-regulating with 55% of their strategies being metacognitive and 11.25% being cognitive. Dissatisfied counterparts utilized metacognitive and cognitive strategies at a lower proportion, 38.10% and 2.38% respectively. Instead, dissatisfied participants looked to others (e.g., seeking social assistance), their surroundings (e.g., environmental structuring), or for consequences or reward. This outcome confirms Lawanto et al.'s (2014b) finding that lower performers tend to report higher help seeking scores.

ER, MSR, and Satisfaction. Differences in the use of ER and MSR strategies in the satisfied and dissatisfied groups were assessed in this study. As anticipated by the researcher, there were higher means for ER and MSR in the satisfied group. The differences were actually statistically significant for both ER and MSR across satisfaction levels, confirming findings in

literature. These findings were also corroborated by qualitative data. Frequency counts of open-ended responses indicating ER and MSR use were higher for satisfied participants. Most interviewees ($N = 7$) reported they were satisfied with their online learning experience, including the lower performers. Conversely, the mean values for ER and MSR were lower in the dissatisfied group. Frequency counts for ER and MSR for open-ended responses were lower as well, indicating corroboration of quantitative and qualitative data. These findings align with what is found in literature; online learners with poor use of SRL tend to be dissatisfied (Allen & Seaman, 2008). The poor use of SRL could be the result of lack of knowledge, building a case for teaching or training learners SRL strategies in online environments and offering learner prompts.

Summary of Findings

Three major findings emerged from this study. First, the relationship between SRL and academic performance could be better discerned. A larger sample size or broader range of participant GPAs could help better explain this relationship. Other mediating factors such as self-efficacy or even socioeconomic status could also play a role in describing the relationship between SRL and academic achievement.

Second, differences between MSR and ER means indicate more use of ER strategies for the higher and lower performing participants in this study. However, there was not a statistically significant difference in MSR and ER use across academic performance level. The lower MSR mean for the group with a higher GPAs was unexpected and posed questions of learner calibration, range restriction in participant characteristics, and a possible need for training in MSR strategies specifically.

Third, SRL has a strong positive and statistically significant relationship with satisfaction. Additionally, participants who were satisfied with their online course experience carried higher MSR and ER means than their dissatisfied counterparts. The differences between MSR and ER were statistically significant across satisfaction levels. These outcomes suggest affective variables, like satisfaction, could relate to use of SRL strategies like MSR and ER.

Limitations

The three main limitations of this study were sample size, sampling procedure (inclusive of participant recruitment process), and the study's design.

First, a larger sample size ($n > 102$) would increase the validity of the study and generalizability of findings. The release time of the survey likely impacted the number of participants. The survey was launched at the end of the 2017 academic year, meaning participants were beginning to travel in the summer for vacation. A little over half of the participants completed the online survey between June and August of 2017. Response rates increased at the onset of the Fall 2017 academic year. Over 40 survey responses were submitted within a week's time. This also coincided with an increase in the financial incentive from \$20 to \$25. The electronic gift cards could have also contributed to a more homogeneous sample, attracting a subset of recent online graduates motivated by financial gain.

Second, the sampling procedure posed a threat to external validity. Multiple online high school administrators were solicited for support in disseminating the invitation to participate in the online survey. The invitation to participate in the survey was also circulated using social media outlets like Facebook, LinkedIn, Twitter, and Instagram. Thus, the sample represents a convenience sample based on the participation rates of online high school administrators and

recent online graduates utilizing social media. Outcomes of a convenience sample cannot necessarily be generalized to the larger population (Leedy & Ormrod, 2010).

Third, the study's design posed a threat to internal validity and generalizability. Use of self-reported survey data challenges internal validity. For example, social desirability bias could have led to higher values for participant GPA, current educational status, reported use of SRL strategies, or even satisfaction levels with their last online course. Furthermore, its correlational design does not allow the researcher to draw accurate conclusions or even infer cause-and-effect relationships within the data (Leedy & Ormrod, 2010).

Recommendations for Future Research

Outcomes from this study help identify areas of future research and offer insights to improve practice at both the secondary and postsecondary level. The findings suggest other variables should be examined to better understand use of SRL. Since the relationship between SRL and academic performance was not strong, the role of other mediating factors should be explored in future studies. For example, Greene's (2015) work on cognitive engagement, which includes SRL processes, considers the role of self-efficacy, a motivational variable, in explaining academic achievement. Fenollar, Roman, and Cuestas's (2007) model on the antecedents of academic performance also suggests self-efficacy along with achievement goals could help explain the relationship between SRL and academic performance. Thus, self-efficacy, and other motivational components of SRL or a specific achievement goal could be assessed in concert with academic achievement in future correlational studies or through other research designs (Cho & Shen, 2013; Fenollar et al., 2007; Greene, 2015).

Higher ER means for quantitative data and higher ER frequency counts for qualitative data in this study highlight the importance of exploring this variable further in the context of

SRL. Future research could focus on the broader construct of ER, measuring its degree of use or pinpoint which dimensions of ER most impact academic performance. As described by participants in this study, specific ER strategies could involve learners determining their ideal study conditions (e.g., environmental structuring) or seeking ways to maintain their interest in an academic task or process. Replicating Bol et al.'s (2016) study with community college students could further explore the impact of SRL training on ER via environmental structuring along with MSR, and factor in the broader construct of academic performance. Interest, a cognitive and motivational variable enveloped by the larger construct of engagement, could also be specifically explored. Interest could be measured in future studies with observational methods to augment self-report data (Renninger & Bachrach, 2015).

Implications for Practitioners

Educators, whether at the secondary and postsecondary levels, may also apply the outcomes of this study to what they do on a regular basis. Implications from research may aid administrators in making decisions regarding the setup and operation of an online program. Likewise, instructional designers or teachers may choose to integrate research-based best practices in the delivery of course materials.

Understanding what promotes ER strategies can contribute to the design of learning environments and materials that engage. For example, administrators of an online high school influence the student's learning environment through decisions made about course format and use of technology. While one student might thrive in asynchronous courses delivered in a Learning Management System (LMS) like Blackboard, another might prefer more interaction from synchronous or blended/ hybrid courses offered via Adobe Connect.

Stakeholders at the secondary and postsecondary level, such as administrators and teachers, can teach, promote, or even model environmental structuring, finding interest, or self-consequence strategies. For example, teachers or instructional designers may create a lesson or unit that integrates the ER strategy of finding interest. In an online history course, the teacher could present a topic, like slavery, and extend the opportunity to discuss one aspect of the topic in a paper. One student might write about the economic impact of slavery while another might choose to discuss the impact of slavery on Black families. From an instructional design perspective, these kinds of design decisions relate to instructional values about priorities such as learner appeal and instructional conditions such as learner interest (Reigeluth & Carr-Chellman, 2009).

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APPENDIX A

DEMOGRAPHIC AND SUPPLEMENTAL ITEMS

Instructions: Select the most appropriate response based on question type.

1. I am at least 18 years old. [Choose Yes]

2. What year did you graduate from TTUISD online high school? [Choose 2016 or 2017]
 or What year did you graduate from an online high school? [Choose 2016 or 2017]

3. What is your gender? [Choose Male or Female]

4. Please select the racial category or categories with which you most closely identify, if applicable. Select one or more categories. [Choose American/Alaska Native, Asian, Black or African American, Hawaiian/Pacific Islander, White/Caucasian, Hispanic/Latino]

5. What best describes the format of the last online course you completed with TTUISD as a high school senior? [Choose Online high school course with TTUISD; Independent study/correspondence course; Credit by exam; Other please explain (with text box)]
 or What best describes the format of the last online course you completed as a high school senior? [Choose Online high school course with TTUISD; Independent study/correspondence course; Credit by exam; Other please explain (with text box)]

6. What was your final high school grade point average (GPA) on a 4.00 scale at TTUISD online high school? Enter a total of three numbers (values between 0.00 and 4.00) below.
 If you need help converting grades on a 100-point scale to a 4.00 scale, you may open another web browser and copy and paste the following link:
<http://www.collegeboard.com/html/academicTracker-howtoconvert.html>.
 [Enter a numeric value.]

7. Which option best describes your current educational status? [Choose Not taking any courses—via a job training program, career/trade school, two year college, or four year institution (e.g., university) at this time; Enrolled in job training program or career/trade school; Enrolled in a branch of the military; Enrolled in a two year college (e.g., community college or junior college); Enrolled in a four year institution (e.g., college or university); Enrolled in a postgraduate program (e.g., pursuing a Master’s degree or higher, law school, medical school, etc.)]

8. Approximately how many online courses have you completed? [Choose Novice-This is my first online course, Beginner-1-2, Experienced-3-5, Proficient-6 or more] – multiple choice question

9. What is your main reason for enrolling in this online program or for taking online coursework? [Choose To access advanced courses/to work ahead, To make up coursework, To help me continue homeschooling, As a stronger academic alternative to my local high school/school district]

10. Students who have completed at least one online course with TTUISD in 2016 or 2017 as a high school senior AND who are 18 or older (as of 1/1/17) are eligible to participate.

The first 150 eligible participants to respond will be eligible for a gift card upon if they complete all survey items. Gift cards will be delivered twice a week to eligible participants. Participants *not* receiving a gift card will be notified at the close of the survey.

Please enter your email address so the researcher may contact you if you are one of the first 150 eligible participants to respond to all survey items in this study. [Enter email address]

or Which online school awarded you a high school diploma? [Choose Texas Tech ISD Online HS, University of Texas High School, US Department of Defense Education Activity (DoDEA) Virtual High School, Brigham Young University Independent Study Online High School, Indiana University High School, Mizzou K-12 online school, The University of Mississippi Independent Study High School, Liberty University Online Academy, Other (please specify)]

11. Students who have completed at least one online course with TTUISD in 2016 or 2017 as a high school senior AND who are 18 or older (as of 1/1/17) are eligible to participate.

The first 150 eligible participants to respond will be eligible for a gift card upon if they complete all survey items. . Gift cards will be delivered twice a week to eligible participants. Participants *not* receiving a gift card will be notified at the close of the survey.

Please re-enter your email address so the researcher may contact you if you are one of the first 150 eligible participants to respond to all survey items in this study. [Enter email address]

or Please enter your email address so the researcher can contact you regarding a e-gift card.
Note: You may only receive a maximum of one e-gift for completing this survey for this study.
[Enter email address]

12. If you are one of the first 150 eligible participants to respond to all survey items, you will receive a gift card via email. [Enter email address]

or Please re-enter your email address. [Enter email address]

13. Please indicate what type of gift card you prefer, although we may not be able to honor every request: [Choose Amazon or Starbucks]

APPENDIX B

ONLINE SELF-REGULATED LEARNING QUESTIONNAIRE (OSLQ)

(Barnard, Lan, To, Paton, & Lai, 2009)

Directions: Select a value between 5 and 1 to indicate your level of agreement. . A value of 5 means you strongly agree; 4 agree; 3 neutral; 2 disagree; and 1 strongly disagree.

1. I set standards for my assignments in online courses
2. I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).
3. I keep a high standard for my learning in online courses.
4. I set goals to help me manage studying time for my online courses.
5. I don't compromise the quality of my work because it is online.
6. I choose the location where I study to avoid too much distraction.
7. I find a comfortable place to study.
8. I know where I can study most efficiently for online courses.
9. I choose a time with few distractions for studying for my online courses.
10. I try to take more thorough notes for my online courses because notes are even more important for learning online than in a regular classroom.
11. I read aloud instructional materials posted online to fight against distractions.
12. I prepare my questions before joining in the chat room and discussion.
13. I work extra problems in my online courses in addition to the assigned ones to master the online course content.
14. I allocate extra studying time for my online courses because I know it is time-demanding.
15. I try to schedule the same time every day or every week to study for my online courses, and I observe the schedule.
16. Although we don't have to attend classes daily, I still try to distribute my studying time evenly across days.
17. I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.
18. I share my problems with my classmates online so we know what we are struggling with and how to solve our problems.
19. If needed, I try to meet my classmates face-to-face.
20. I am persistent in getting help from the instructor through e-mail.
21. I summarize my learning in online courses to examine my understanding of what I have learned.
22. I ask myself a lot of questions about the course material when studying for an online course.
23. I communicate with my classmates to find out how I am doing in my online classes.
24. I communicate with my classmates to find out what I am learning that is different from what they are learning.

APPENDIX C

MSR AND ER SUBSCALES FROM THE MODIFIED MOTIVATIONAL STRATEGIES AND LEARNING QUESTIONNAIRE (MSLQ) (Mao & Peck, 2013)

Instructions: Choose a value between 1 (not at all true of me) and 7 (very true of me) for each item.

Effort Management Subscale

37. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.
(REVERSED)
48. I work hard to do well in this class even if I don't like what we are doing.
60. When course work is difficult, I either give up or only study the easy parts. (REVERSED)
74. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

MSR Subscale

33. While working on this course, I often miss important points because I'm thinking of other things. (REVERSED)
36. When reading for this course, I make up questions to help focus my reading.
41. When I become confused about something I'm reading for this class, I go back and try to figure it out.
44. If course readings are difficult to understand, I change the way I read the material.
54. Before I study new course material thoroughly, I often skim it to see how it is organized.
55. I ask myself questions to make sure I understand the material I have been studying in this class.
56. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.
57. I often find that I have been reading for this class but don't know what it was all about.
(REVERSED)
61. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.
76. When studying for this course I try to determine which concepts I don't understand well.
78. When I study for this class, I set goals for myself in order to direct my activities in each study period.
79. If I get confused by the material, I make sure I sort it out afterwards.

APPENDIX D

COURSE SATISFACTION QUESTIONNAIRE (CSQ)

(Faul et al., 2004)

Instructions: We are interested in your general satisfaction with the last online course you completed. Please use the following scale to rate your level of satisfaction with the different aspects of the course:

Completely dissatisfied 1 2 3 4 5 6 7 *Completely satisfied*

1. The amount of interaction between you and your instructor.
2. The quality of interaction between you and your instructor.
3. The cooperation between you and your classmates.
4. The manner in which the syllabus was distributed.
5. The logical organization of the course content.
6. The reminders given to you about assignments due.
7. The manner in which guidelines were given on the completion of assignments.
8. The lecture notes provided to you.
9. The extra learning resources provided to you (e.g., extra handouts, on-line resources, list of frequently asked questions, on-line discussion groups, on-line weekly quizzes).
10. The format of the different assignments.
11. The learning value of the assignments.
12. The options available to you to hand in assignments.
13. The time it took for your instructor to provide feedback on graded assignments.
14. The quality of the feedback provided on graded assignments.
15. Access to your grades during the semester.
16. The teaching style of your instructor.
17. The assistance given by the instructor in completing the course successfully.
18. The instructor in terms of his[/her] devotion to the course.
19. The accommodation of your approach to learning in the way this course was taught.
20. The increase in your knowledge and/or skills as a result of this course.
21. The increase in confidence in using the knowledge and/or skills as a result of this course.

APPENDIX E

OPEN-ENDED QUESTIONS ABOUT OVERALL SRL STRATEGIES

(Adapted from Self-Regulated Learning Interview Schedule or SRLIS)

(Zimmerman & Martinez-Pons, 1988)

Instructions: Please type detailed responses to each question below.

1. How did you learn and remember course materials? [Enter text.]
2. What steps did you follow to complete homework? [Enter text.]
3. Describe your approach to writing papers. [Enter text.]
4. How did you prepare for tests? [Enter text.]
5. How did you go about completing assignments of no interest to you? [Enter text.]
6. Describe your most productive study session. [Enter text.]

APPENDIX F

EMAIL INVITATION TO PARTICIPATE IN THE STUDY

Subject line: Class of 2016 and 2017 Research: Amazon or Starbuck's Gift Cards Available

Message:

Dear Recent TTUISD Grad,

You are invited to share your valuable input in a 30 to 45 minute survey.

Students who have completed at least one online course with TTUISD in 2016 or 2017 as a high school senior AND who are 18 or older are eligible to participate.

The first 150 eligible participants to complete the survey will receive their choice of a \$5 Amazon or Starbuck's gift card via email. Gift cards will be delivered twice a week to eligible participants. Participants *not* receiving a gift card will be notified at the close of the survey.

In the survey, you will be asked for demographic and academic information (such as your age, final high school GPA, etc.).

Additionally, you will have an opportunity to answer questions about how you learn, your motivation levels toward learning, and degree of satisfaction with a recently completed course.

Your survey responses are confidential. Only the researchers associated with this study will have access to the data. Any identifiers on the data will be removed by the researcher and saved in a password-protected document prior to processing. The data will be permanently deleted after five years. There are no penalties for choosing not to participate. Keep in mind records may be subpoenaed by court order or inspected by government bodies with oversight authority.

Although outcomes from this study may be used in reports, presentations, and publications, the researcher will not identify participants.

If you have any questions about the study or participation, please contact Responsible Project Investigator Dr. Tian Luo at tluo@odu.edu or 757-683-5369.

[Click here to proceed to the online survey.](#)

(This survey will be open for three weeks. It will close at 11:59 pm EST on XX/XX/XX.)

APPENDIX G

SAMPLE EMAIL INVITATION TO PARTICIPATE IN THE STUDY

Subject: Win a \$20 e-Gift Card for Completing an Online Graduate Research Survey

2016 & 2017 UTHS Grads:

For a Limited Time, Complete this Survey for a \$20 e-Gift Card!

Start Survey
(link to www.surveymonkey.com/r/onlineHSgrad)

This survey may be completed only once. A maximum of one gift card will be awarded to each eligible participant who completes the survey. Gift cards will be delivered once a week via email.

UT Alum, Texas OnCourse Fellow, and doctoral researcher Jenifer Price is completing a dissertation under the supervision of Dr. Tian Luo at Old Dominion University. The project title is *An Analysis of Self-Regulated Learning Strategies, Academic Performance, and Satisfaction among Recent Online High School Graduates*.

UTHS Class of 2016 & 2017 graduates 18 and older are invited to take this survey, which will take approximately 20 minutes to complete.

Aside from demographic and academic information, participants will answer questions about how they learn, their motivation levels toward learning, and degree of satisfaction with a recently completed online course.

Your survey responses are confidential. Only the researchers associated with this study will have access to the data. Any identifiers on the data will be removed by the researcher and saved in a password-protected document prior to processing. The data will be permanently deleted after five years. There are no penalties for choosing not to participate. Keep in mind records may be subpoenaed by court order or inspected by government bodies with oversight authority.

Although outcomes from this study may be used in reports, presentations, and publications, the researcher will not identify participants. If you have any questions about the study or participation, please contact Doctoral Candidate Jenifer Price at jpric036@odu.edu or Responsible Project Investigator Dr. Tian Luo at tluo@odu.edu.

APPENDIX H

INTERVIEW PROTOCOL

(phone)

-Thank you again for your willingness to participate in this follow-up interview about the use of learning strategies and satisfaction levels of recent online high school graduates.

-I would also like to acknowledge I have received your completed online consent form.

OR

-To conduct this interview, I will need a copy of your completed online consent form. Can you access it at www.surveymonkey.com/r/YesToTheStudy? When you have reviewed the consent form and submitted it, please let me know.

-During this interview, I will jot down notes based on your responses for data gathering purposes. Following our call, I will email these notes to you for review. Please review these notes and email me within 24 hours regarding any comments needing to be revised.

-Once all follow-up interviews are concluded, one participant's email address will be selected in a random drawing. The researcher will ask for a mailing address and send the Fire HD8 tablet to the winner of the drawing.

-A final copy of this study will be made available to you upon request.

(email interview)

-Thank you again for your willingness to participate in this follow up interview about the use of learning strategies and satisfaction levels of recent online high school graduates.

-To conduct this interview, I will need a copy of your completed online consent form. Can you access it at www.surveymonkey.com/r/YesToTheStudy? Once I receive your consent form, I will email you the follow-up interview questions.

OR

-I would also like to acknowledge I have received your completed online consent form. Please answer the following interview questions in roughly one paragraph.

-Once all follow-up interviews are concluded, one participant's email address will be selected in a random drawing. The researcher will ask for a mailing address and send the Fire HD8 tablet to the winner of the drawing.

-A final copy of this study will be made available to you upon request.

Interview Questions with Probes

(Context)

1. Briefly tell me about your decision to complete your studies via an online high school?

- a. Please describe any events or circumstances that led to you enrolling in an online high school.
- b. Describe your typical “school day” or day of school work?

(Satisfaction)

2. Describe your overall level of satisfaction with your last online course experience.

- a. What did you like most about your experience in an online high school?
- b. What did you like least about your experience in an online high school?
- c. If you could change one thing about your last online course, what would it be?

(Effort Regulation)

3. Describe an online course that was difficult for you.

- a. What aspect of the course was most difficult for you (e.g. instructor, course material, assignments, etc.)?
- b. What did you do to try to succeed in this course?

4. What did you do when course materials or assignments were boring?

- a. How did you keep yourself motivated?
- b. What specific strategies did you use to finish your work?

(Metacognitive Self-Regulation)

5. When given new material to learn (e.g., a chapter or chapters on a new topic), describe the steps you followed to learn the material.

- a. What role did goal-setting play in learning the new material? (Forethought Phase: Goal-setting)
- b. Describe any techniques used to learn the material (e.g., reading-previewing chapter/skimming, highlighting/note-taking, rewriting notes/paraphrasing, etc.). (Performance Phase: task strategies, self-instruction)
- c. If you ever found your mind wandering (or confused) during studying, what did you do? (Performance Phase: Metacognitive monitoring)
- d. What is your thought process when you receive a graded test back (e.g., review incorrect answers/figure out why you missed a question, compare grade with peers)? (Self-reflection Phase: Self-judgment)
- e. What is your response to a low test grade? High test grade? (Self-reflection Phase: Self-reaction)

APPENDIX I

INFORMED CONSENT FORM

PROJECT TITLE: Understand the use of learning strategies and satisfaction levels of recent online high school graduates.

INTRODUCTION

The purposes of this form is to offer you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. The title of this study is *An Analysis of Self-Regulated Learning Strategies, Academic Performance, and Satisfaction among Recent Online High School Graduates*. The research study will be conducted over the phone or via email at a time that is convenient for you as a part of a dissertation study at Old Dominion University.

RESEARCHERS

Responsible Principal Investigator:

Tian Luo, PhD

Assistant Professor, Instructional Design & Technology

Certificate Program Coordinator: Online Teaching for K-12 Teachers

Department of STEM Education & Professional Studies

Education Building 43rd and Hampton Boulevard #4106

Darden College of Education

Old Dominion University

Norfolk, VA 23529

Co-Investigator(s):

Jenifer L. Price, LMSW-IPR

Doctoral Candidate, Instructional Design & Technology

Department of STEM Education & Professional Studies

Education Building 43rd and Hampton Boulevard #4106

Darden College of Education

Old Dominion University

Norfolk, VA 23529

DESCRIPTION OF RESEARCH STUDY

Online learning in the K12 sector is on the rise. Concerns about academic performance have resulted in heightened interest in self-regulated learning (SRL) as a means to count the challenges faced while learning online. This study aims to identify which SRL strategies were utilized by recent online high school graduates, understand how these SRL strategies were applied to different academic assignments, and more fully discern satisfaction levels with learning online (e.g. final online high school course).

If you decide to participate, then you will join a follow-up interview exploring your experiences as a recent graduate of an online high school. This research study will be conducted through

individual interviews. If you say YES, then your participation will last for approximately 10 minutes over the phone or via email. A total of 10 recent online high school graduates from the Class of 2016 or 2017 will be participating in these individual interviews.

EXCLUSIONARY CRITERIA

You should be a recent graduate of an online high school (in either 2016 or 2017). To the best of your knowledge, you should be 18 years or older and have completed at least one class online. Otherwise, you are ineligible to participate at this time.

RISKS AND BENEFITS

RISKS: If you decide to participate in this study, you may risk facing feelings of discomfort related to disclosing personal or academic information like demographics and GPA respectively. The researcher will try to reduce these risks by removing identifiers for each research participant during data analysis and offering the option to withdraw from the study at any time. As with any research, there is some possibility you may be subject to risks that have not yet been identified.

BENEFITS: The main benefit to you for participating in this study is entry in a drawing for a Fire HD8 tablet, self-growth, and reflection that can come from disclosing and processing your thoughts and feelings.

COSTS AND PAYMENTS

There is no cost for participating in the study. The researchers will randomly select one entry from a drawing for a Fire HD8 tablet (1 out of 10 will win).

NEW INFORMATION

If the researchers find new information during this study that would reasonably change your decision about participating, then they will give it to you. You are free to withdraw from the study at any time.

CONFIDENTIALITY

The researchers will take all reasonable measure to keep private information, such as written interview responses or notes from phone interviews confidential. Only the researchers listed above will have access to your data. The researcher will remove any identifiers of the data and password-protect stored data prior to processing. The results of this study may be used in reports, presentations, and publications; but the researcher will not identify you. Of course, your records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study -- at any time. Your decision will not affect your relationship with Old Dominion University, or otherwise cause a loss of benefits to which you might otherwise be entitled. The researchers reserve the right to withdraw your participation in this study, at any time if they observe potential problems with your continued participation.

COMPENSATION FOR ILLNESS AND INJURY

If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of harm arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project, you may contact Jenifer Price at jpric036@odu.edu or 512-507-1894, Dr. Jill Stefaniak, the current chair of the DCOE Human Subjects Committee at jstefani@odu.edu or [757-683-6696](tel:757-683-6696) at Old Dominion University, or the Old Dominion University Office of Research at [757-683-3460](tel:757-683-3460) who will be glad to review the matter with you.

VOLUNTARY CONSENT

Voluntary consent means several things. You are saying that you have read this online form or have had it read to you, or that you are satisfied that you understand this form, the research study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them or you can contact Jenifer Price at jpric036@odu.edu or 512-507-1894.

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. Jill Stefaniak, the current chair of the DCOE Human Subjects Committee at jstefani@odu.edu or 757-683-6696 at Old Dominion University or the Old Dominion University Office of Research at 757-683-3460.

When you check Yes to Question 3 of the online Informed Consent Form, you are telling the researcher YES, you agree to participate in this study. You may print off a copy of this form for your records.

INVESTIGATOR'S STATEMENT

As the investigator, I certify that I have explained to this subject the nature and purpose of this research, including benefits, risks, costs, and any experimental procedures. I have described the rights and protections afforded to human subjects and have done nothing to pressure, coerce, or falsely entice this subject into participating. I am aware of my obligations under state and federal laws, and promise compliance. I have answered the subject's questions and have encouraged him/her to ask additional questions at any time during the course of this study.

The investigator will print off and sign a copy of the participants' online responses to the informed consent form before participating in the follow-up phone or email interview. You may request a copy of this print off with the researcher's signature.

VITA

JENIFER L. PRICE, LMSW

106 N. Frontier Lane; Cedar Park, TX 78613

Email: jeniferprice@yahoo.com; Phone: (512) 507-1894 (mobile)

AREAS OF INTEREST:

Distance education/online learning; self-regulated learning (SRL); academic achievement in secondary and postsecondary level students; college going culture and college access/readiness in secondary level students; career selection in youth and young adults

EDUCATION:

PhD, Instructional Design & Technology (IDT) Old Dominion University; Norfolk, Virginia	Currently enrolled
Masters in Science, Social Work University of Texas at Austin; Austin, Texas	Degree conferred 5/98
Bachelors of Arts, Sociology University of Texas at Austin; Austin, Texas	Degree conferred 8/96

LICENSURE/DESIGNATIONS:

Licensed Masters Social Worker (LMSW) Texas State Board of Examiners; Austin, Texas	Currently licensed, (originally licensed 6/98, continuing education for license renewal every two years)
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RELEVANT EXPERIENCE:

College Counselor Hyde Park Schools; Austin, Texas	8/15-Present
<ul style="list-style-type: none"> • Advise high school students and their families in the undergraduate admissions and scholarship search process • Develop and coordinate guidance events on topics ranging from college admissions to interpreting PSAT scores • Systematically release communication to students and their families on the web, via electronic newsletters, announcements, and bulletin board posts • Nominate student and campus leaders for recognition programs, awards, and scholarships • Coordinate visits to campus by college admission recruiters 	
Sr. College & Career Advisor UVISEME, LLC (formerly College and Career Planning Services); Austin, Texas	4/98-Present

- Review academic records, psychological assessments, and individual education plans in order to appropriately advise students
- Deliver educational and career counseling services to students seeking guidance in undergraduate admissions
- Administer career assessments, interpret results, and recommend college majors and/or careers
- Aid teens in selecting core and elective courses (e.g. dual credit, advanced placement, etc.) plus career-relevant extracurricular and/or service activities along with internships
- Create and present dynamic career exploration/preparation workshops and seminars locally and at the statewide level to educators, parents, and students
- Edit resumes, cover letters, applications, and/or essays for college admissions, internships, employment, or scholarships

Career Resource Center Coordinator (following promotion); 3/98-1/00
Employment Training Specialist and CTE Teacher (initial position)

American Youthworks Charter High School; Austin, Texas

- Created and facilitated new hire and new student orientations (including the development of a manual)
- Screened, interviewed, hired, supervised, and evaluated up to 10 staff (e.g. career center, summer, and volunteer staff)
- Developed a tracking system for program evaluation
- Provided job coaching and career counseling services to academically at-risk youth
- Taught Career Connections, Marketing Education, and Entrepreneurship courses
- Referred students to appropriate community resources and programs as needed

TEACHING/TEACHING & RESEARCH ASSISTANT EXPERIENCE:

Career and Technical Education (CTE) Teacher 8/01-11/05
 Austin Independent School District; Austin, Texas

- Instructed students in the use of word processors, spreadsheets, presentation and publishing software in Computer Literacy and Keyboarding courses
- Taught pre-teens/teens from underrepresented populations the career decision-making process, how to research careers, and create four year plans (academic) in Career Investigations course
- Identified and hosted various professionals for school-wide assemblies on career exploration (e.g. healthcare, legal, social services/helping)

Teaching/Research Assistant 8/97-5/98
 University of Texas at Austin, School of Social Work; Austin, TX
 Faculty/Supervisor: Dr. Yolanda Padilla

- Instructional support, including test administration and scoring
- Research support such as retrieving journal articles and transcribing interview questions
- Performed various other administrative tasks as needed

Teaching/Research Assistant 6/97-8/97

University of Texas at Austin, School of Social Work; Austin, TX

Supervisors: Office of the Dean & Master's Program

- Designed and coordinated new graduate student mentorship program (e.g., JumpStart)
- Revised departmental handbook
- Performed various other administrative tasks as needed

Undergraduate Research Fellow

6/95-12/95

University of Texas at Austin, College of Liberal Arts, Sociology Department; Austin, TX

Faculty/Supervisor: Dr. Christopher Ellison

- Identified and procured articles relevant to study areas (e.g., sociology, religion, African American populations)
- Performed various other administrative tasks as needed

RESEARCH PAPERS PRESENTED AT PROFESSIONAL MEETINGS:

Association for Educational Communications and Technology

10/16

Learning in Las Vegas 2016 Convention

Faculty/Co-presenter: Dr. Ginger Watson, Old Dominion University

- Poster Presentation Titled: Online Learning Experience, Metacognitive Self-Regulation, and Achievement in Pre-service Teachers

RESEARCH & MANUSCRIPTS IN PROGRESS:

Dissertation: An Analysis of Self-Regulated Learning Strategies, Academic Performance, and Satisfaction among Recent Online High School Graduates (in progress)

Faculty Advisor/Dissertation Chair: Tian Luo, PhD

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

American Educational Research Association (AERA)-Member 2015-Present

Association for Educational Communications and Technology (AECT)-Member 2012-Present

National Career Development Association (NCDA)-Member 2006-Present

Independent Educational Consultants Association (IECA)-Professional Member 2006-Present
and Associate Member 2005-2006

Texas Association of College Admission Counselors (TACAC)-Member 2005-Present

UNIVERSITY SERVICE:

New PhD Student Orientation in Instructional Design and Technology

Summer 2014

Old Dominion University; Norfolk, VA (online, synchronous)

- Presented advice and recommendations for success in PhD program

Instructional Design Project with Master's Level Students Fall 2011

University of Texas at Austin; Austin, TX

Faculty: Dr. Min Liu

- Served as a subject matter expert for design assignment, provided content for instructional module

COMMUNITY SERVICE:**Junior League of Austin-** Sustainer Member 2015-Present

Active Member 2010-2015

- Assisted Con Mi Madre (formerly Hispanic Mother Daughter Program) with leadership and college access events; volunteered 50 hours/year from 2011-2015

South-by-Southwest Blacks in Technology Committee (BiT)-Member 2011-2012

- Helped coordinate recognition event; volunteered approximately 20 hours

Girl Scouts, Inc.-Adult Member 2005-2010

- Presented college preparation seminars at headquarters and for conferences; volunteered approximately 10 hours/year, 50 hours total

Junior Achievement-Volunteer Fall 2007

- Taught life skill lessons to teens once a week; volunteered approximately 30 hours

HONORS, AWARDS, PRIZES (Graduate Level):**Golden Key International Honor Society-**Member 12/12-Present**Old Dominion University Graduate Student Travel Award** Fall 2016

Award: \$500

Alpha Kappa Alpha Educational Advancement Foundation, Inc. Fall 2012

- Scholarship Recipient (\$850)

Professional Women of Williamson County (PWOW) Spring 2012

- Scholarship Recipient (\$1000)

University of Texas Graduate Admissions, Graduate Opportunity Program 1996-1998

- Graduate Opportunity Fellowship-\$25,000 value; full tuition for two years (\$14,000 value) plus \$11,000 living stipend year one

REFERENCES:

Available Upon Request