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Investigation of preservice teachers' perceptions of locus of control, self-regulation, and motivation in online learning

Sung-Ho Min
University of Northern Colorado

UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

AN INVESTIGATION OF PRESERVICE TEACHERS' PERCEPTIONS OF LOCUS OF CONTROL, SELF-REGULATION, AND MOTIVATION IN ONLINE LEARNING

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Sung-Ho Min

College of Education and Behavioral Sciences
Department of Educational Technology

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Accepted by the Doctoral Committee

_____
Jeffrey W. Bauer, Ph.D., Co-Chair

_____
James E. Gall, Ph.D., Co-Chair

_____
Dean A. Phillips, Ph.D., Committee Member

_____
Steven M. Pulos, Ph.D., Faculty Representative

Date of Dissertation Defense _____

Accepted by the Graduate School

_____
Linda L. Black, Ed.D., LPC
Acting Dean of the Graduate School and International Admissions

ABSTRACT

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This study examined how students' perceptions of locus of control, self-regulation, and motivation were related in an online learning environment. The participants were 73 preservice teachers enrolled in two online technology courses. Near the end of their online course, the participants completed *Brown's Locus of Control Scale* (BLOCS), the *Online Self-regulated Learning Questionnaire* (OSLQ), and Keller's *Instructional Materials Motivation Survey* (IMMS). No significant relationship was found between locus of control and self-regulation or between locus of control and motivation. There was a significant relationship between self-regulation and motivation. The self-regulation subscales of task strategies and time management were significantly correlated with all the motivation subscales (attention, relevance, confidence, and satisfaction). Goal setting was significantly correlated with all but the attention motivation subscale. This study provides further evidence of the important relationship between engaging in self-regulation activities and positive attitudes towards online learning.

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CHAPTER I

INTRODUCTION

Online learning environments are an important part of higher education today. According to the Sloan Consortium (2011), over 6.1 million U.S. college students (nearly one-third of all those enrolled) were taking at least one online course in the fall of 2010. Since the late 1990s, there has been a continuous increase in the number of educational institutions that have used the Internet to augment traditional academic programs.

Currently in higher education, educational use of the Internet focuses on Learning Management Systems (LMS). An LMS (such as Blackboard, Desire2Learn, WebCT, and Moodle) utilizes the Internet for the delivery of course materials chosen or developed by instructors. These materials are available to online learners at any time from any location.

According to Volery (2001), the success factors for teaching effectiveness in online education are found in three main areas: the technology, the instructor's characteristics, and the learner's characteristics. For the purposes of this study, the researcher chose to focus on examining learner characteristics. There are many learner characteristics that potentially affect online learning. Self-regulation, locus of control, and motivation were chosen for further examination based on their prominence in past literature. For example, according to Sun and Rueda (2012), previous research indicated that because distance education learners lack direct encouragement from instructors, they may be less self-regulated in online activities. Yukselturk (2009) describes research as

showing that successful students are more often associated with an internal locus of control and that this is a critical success factor for online learning. Kim and Frick (2011) looked at motivation in online learning in terms of three factors: internal, external, and personal.

Purpose

The purpose of this study was to examine how students' self-regulation, locus of control, and motivation were related in online learning environments. Information gathered from this study provides researchers, instructional designers, and instructors with insights about these factors (self-regulation, locus of control, and motivation) that can be applied to their various educational endeavors. Furthermore, this study adds to our understanding of the challenges of accommodating students in online learning environments.

Many other researchers have studied factors that have the potential to help students be successful in online learning (e.g., Zacharis, 2011; Chen, Pederson, & Murphy, 2011; Sun, & Rueda, 2012). Although self-regulation, locus of control, and motivation have each been studied individually in both face-to-face and online courses, examining all three together in order to examine correlations offered insights regarding learner behavior in a specific online learning environment.

Rationale

The three constructs--self-regulation, locus of control, and motivation--were selected as a basis of this study in order to examine learners' success in the online learning environment. Self-regulation has been a major concern in online learning environments. With regard to social learning theory, researchers who explored self-regulation in online learning have reported that learners with the capability of using

autonomous study strategies would be very motivated to engage in online learning. Some of them (i.e., Pintrich, Marx, & Boyle, 1993) suggested a positive relationship between self-regulation and academic achievement in the classroom. Other researchers (i.e., Barnard, Lan, To, Paton, & Lai, 2009) have developed an instrument to investigate student behavior with regard to self-regulation in both online and blended learning environments. As a result, the researcher was interested in examining this construct and determining whether it correlated with the other two constructs chosen for this study.

Locus of control was also examined in this study. Motivated learners often prefer the increased control they have in online courses. Rotter (1966) presumed that learners had different perspectives on their ability to achieve results. Some people think that their lives depend on external forces, such as a deity or other authorities, while others believe that they control their own fate. This construct is called locus of control. External locus of control indicates the belief that other people and external factors have control over one's life. On the contrary, people who demonstrate high internal locus of control believe that their lives depend on their own will, rather than that of others. Since Rotter coined the term, many other researchers have adopted the construct for use in their studies. Rotter (1990) cautioned that the construct is a matter of degree, not of kind. It's important not to label individuals as internal or external. However, some evidence indicated that general reports of locus of control could provide meaningful insight to better understand online learner characteristics.

Motivation is the third construct that forms this research. This study is mostly concerned with motivation as it relates to the instructional environment, specifically, the online presentation of instructional materials. As a result, Keller's (2010) Instructional

Materials Motivational Survey (IMMS) was used to determine the attention, relevance, confidence, and satisfaction of the online instructional materials.

Research Questions

Q1 Is there a relationship between a learner's locus of control and motivation in an online course?

Q2 Is there a relationship between a learner's locus of control and self-regulated learning in an online course?

Q3 Is there a relationship between a learner's motivation and self-regulated learning in an online course?

Definition of Terms

ARCS model: Keller (1987, 2010) developed the ARCS model as a theoretical framework for defining different aspects of motivation. ARCS stands for attention, relevance, confidence, and satisfaction. According to Keller, each factor is applied in an educational event.

Brown's Locus of Control Scale (BLOCS): Brown (1990) developed this instrument for measuring college students' locus of control. It includes three subscales: internal, external social, and external other.

Instructional Materials Motivation Survey (IMMS): Keller (2010) developed this instrument for measuring learners' motivation level based on his motivation model.

Learning Management System (LMS): Also, course management system (CMS). Ellis (2009) defined this as a medium that provides automation of the administration, tracking, and reporting of training events and delivering contents.

Locus of Control (LOC): Rotter (1966) presumed that learners have different perspectives on their ability to achieve results. Some people think that their life depends

on external forces, such as a deity or other authorities, while others believe that they control their own lives.

Net Generation (Millennials): Oblinger (2004) described that there was a different type of student emerging in higher education. They are a group of people who were born in or after 1982 and showing different characteristics from previous generations. Bauer (2007) pointed out that some of them are experts at learning through multimedia because of familiarity with various technologies.

Online Learning: Used interchangeably for online education and e-learning. A web-based, computer-assisted learning environment.

Online Self-regulated Learning Questionnaire (OSLQ): Barnard, Lan, To, Paton, and Lai (2009) developed this instrument for measuring online learners' self-regulation.

CHAPTER II

LITERATURE REVIEW

The purpose of this study was to examine how students' self-regulation, locus of control, and motivation levels are related in online learning environments. Online learning environments are worthy of study due to their widespread use in higher education. According to the Sloan Consortium (2011), over 6.1 million U.S. college students (nearly one-third of all those enrolled) were taking at least one online course in the fall of 2010. The report also indicated that 65% of higher education institutions identify online learning as being a critical part of their long-term strategies.

The primary desire of online learning environments is to see positive student learning outcomes. However, those outcomes are, to a large part, generated by various learner behaviors and attitudes. It is important to understand if these factors influence online learning in the same or different ways than in face-to-face environments. In this study, three factors (self-regulation, locus of control, and motivation) were specifically addressed. This review of literature will explain why they were chosen, how they were defined, and how prior researchers have developed instruments to measure them. Relevant research is also discussed.

Online Learning Environments

In general, an online learning environment can be described as an educational activity, or set of activities, utilizing networked computer technologies. Today, a typical

online learning environment would involve a student accessing an Internet website with a personal computer. According to Kearsley (2005), in the early 1970s, there were closed-network and local network systems for training as a form of online education. An increase in the number of smartphone users and other mobile, Internet-accessible devices have lead some to claim that the "web is dead" and that we are entering a next stage of information delivery (Anderson & Wolff, 2010). For online learning environments, this shift has introduced a new term, m-learning (or mobile learning). It is clear that the definition and implementation of online learning has changed over the years.

Although isolated cases in the 1970s (or even earlier) could be termed online learning, it did not become practical until the widespread acceptance of personal computers. Hunter (2005) describes that in the 1980s, several pioneering projects (such as TERC's LabNet, FrEdMail, AT&T's Long Distance Learning Network, and Big Sky Telegraph) attempted to organize online electronic communities for educational purposes. Improvements in networking and computer technologies would create new opportunities for these communities. "In the late 1980s and early 1990s, the development of fiber-optic communication systems allowed for the expansion of live, high-quality audio and video systems in education" (Simonson, 2011, p.85).

The advent of Internet access for the public radically changed the educational environment. Since the Internet became available to the public in the early 1990s, one of its many uses has become that of an educational tool. This new learning environment seemed promising to learners who needed efficient and effective access to teachers and learning materials from a distance. In the late 1990s, there was a fast rise in the number of educational institutions that wanted to use the Internet to augment traditional academic

programs. To provide access to class materials, educators often utilized personal websites. School and district websites distributed information to parents and district participants. Furthermore, email was increasingly used as a communication tool.

As more users and content providers became part of the web, its value as an information resource grew. However, it also became increasingly harder to find information. The importance of search engines in defining the Internet experience and shaping users' interactions cannot be understated. From the mid 1990s to the early 2000s, search engine competition was intense. Various companies such as Webcrawler, Lycos, AltaVista, Daum, Yahoo, and Google were all major players in search engine development. Google would be able to become the top search engine by offering more complex page ranking and information access than any of its competitors (Google, 2000). Google has since expanded its offerings to include searches of scholarly works, images, people, maps, shopping, etc. The ability to search and easily find relevant information continues to be a challenge as the size of the web continues to increase (Robison, 2007).

As online learning continued to grow, educational websites began to incorporate much more functionality than just content delivery. Eventually, they would develop into learning management systems (LMSs). Ellis (2009) states that an LMS is basically "a software application that automates the administration, tracking, and reporting of training events" (p. 1). An LMS (such as Blackboard, Desire2Learn, WebCT, and Moodle) utilizes the Internet for the delivery of course materials chosen or developed by instructors. These materials are available to online learners at any time from any location. According to Bradford, Porciello, Balkon, and Backus (2007), the company behind Blackboard started with a vision to "provide a user-friendly means by which college

professors could put course information, including syllabi, reference sites, and study guides, on the Web" (p. 302). Blackboard has since acquired two other commercial LMSs, WebCT and Angel, increasing an already large share of the educational market. The open source LMSs, such as Moodle and Sakai, are among the second wave of LMS products. Van Rooij (2009) states that these open source LMSs seem more flexible and more economical than other commercial LMSs. Unal and Unal (2011) reported on preservice teachers' experiences and satisfaction with the open source LMS, Moodle. The results were that first-time experience with Moodle was very positive and that many preferred Moodle over Blackboard (with which they had prior experience) for future online courses. Despite Blackboard's marketshare, open source LMSs still offer a viable alternative.

With advances in broadband technologies, many universities are providing more opportunities for their students to access network-intensive online resources such as multimedia and video conferencing. As transfer rates increase for both wired and wireless connections, these applications become more feasible. Ironically, as they do become more commonplace, greater demands are placed on network systems that can result in poorer performance. Theoretically, broadband technologies could allow more complex interactions within LMSs and greater processing in terms of learner data. However, there is little indication that this is currently occurring.

Although the current generation of LMSs dominate online learning in higher education, this is likely to change. In the last few years, there has been greater emphasis on social networking. Various technologies have made it easier to collaborate in the construction of information and building of communities in cyberspace. Dawson (2010) stated, "the 'social' is not the *context* around learning--it *is* the learning process itself"

(p.738). He emphasizes that online learners now rely on social communication tools such as discussion forums, and more recently blogs and wikis. Many Internet users have become more active as a result of participating in social networking sites. Nekritz (2011) explored the features of social media in higher education and believes that user-friendly features, such as game-like aspects, have the most potential to impact learning. People feel comfortable with these social networks because they are familiar and simple to use. It is unclear if LMSs should merely adopt social networking functions, or if social networking represents a fundamental shift in how people expect to interact with information and each other.

Another emphasis in online education is the development of m-learning (or mobile learning). Although m-learning still focuses on the delivery of content via the Internet, the shift is in accommodating the increase in the number of smartphones and other mobile, Internet-accessible devices in the hands of students (Anderson & Wolff, 2010). For example, Szuchman (2005) reported on an early attempt at m-learning and emphasized that the course changes caused by the portable technology "were aimed not at the students' ability to receive information, but, instead, for students to learn new computer skills that would reinforce their abilities to process information" (p. 198). M-learning or mobile learning may provide additional opportunities to learn with peers, because of increased accessibility and interaction. The use of mobile devices is characterized by brief interactions. However, those interactions are much more numerous and varied than those associated with typical PC sessions. Mobile users are always "logged on," even when engaged in the real world. Through social networking services, mobile device users can connect with experts and peers with similar interests to help in

their learning. As the demand increases for more efficient online learning environments, m-learning may take a prominent role in the field of higher education (Peters, 2007).

Online learning has become widely accepted and continues to grow. According to Bradford, Porciello, Balkon, and Backus (2007), Blackboard was then being used by over 12 million users in over 60 countries. According to the Sloan Consortium (2011), there were over 6.1 million students (nearly one-third of all higher education students) taking at least one online course in the fall of 2010. The organization also reported from a survey in which 65% of higher education institutions identified online learning as a critical part of their long-term strategy. Many, if not most, higher education institutions have adopted an LMS for providing their online courses.

Online Learner Characteristics

According to Volery (2001), the success factors for teaching effectiveness in online education are found in three main areas: the technology, the instructor's characteristics, and the learner's characteristics. Examples of technology include ease of access and navigation, the interface design, and the level of interaction enabled. In the short term, the implementation of online learning technologies involves design decisions and tradeoffs. However, in the long term, improvements in technology (as illustrated previously) have brought greater functionality and options to both instructors and students. Instructor characteristics include attitudes towards students, the technical competence of the instructor, and the amount of interaction and feedback the instructor chooses to provide (or is able to provide) in a course. Learner characteristics include previous use and experience with technology, which is often seen as an enabler of success in online learning. Although mastering skills required for success in traditional

schooling is expected of all students, online learning is often characterized as requiring better self-management and more motivation.

In looking at best practices in online learning, Abel (2005) describes widespread adoption of online learning. He does warn that "web-supported" courses in which syllabi or other materials are simply posted online are far more predominant than those in which learning interaction between faculty and students is truly enhanced by the technology. Advances in technology can provide opportunities for more varied and complex interactions (Vrasidas, 2011). Faculty must also be trained and knowledgeable about how interaction in online environments differs from that of face-to-face environments (Simonson, 2011). Arguably, learners often take online courses because of access convenience, not due to perceived educational effectiveness (e.g., Butler & Pinto-Zipp, 2006). In order to support learning interaction, more knowledge of student characteristics in relation to online environments, particularly in those that go beyond simple web support, is needed.

There are many learner characteristics that potentially affect online learning. For example, Zacharis (2011) examined learning style in students' preference for web-based courses. Learning styles can be characterized as different ways in which people use perceive, process, and conceptualize information. Chen, Pedersen, and Murphy (2011) found that various learner characteristics could affect information overload in online learning. For example, learners reported difficulty in reading on screen, typing with a keyboard, preferences for visual or auditory information, time constraints, etc. as various factors that contributed to information overload. According to Sun and Rueda (2012), previous research indicated that because distance education learners lack direct

encouragement from instructors, they may be less self-regulated in online activities. These researchers found that self-regulation was significantly correlated with three types of engagement (behavioral, emotional, and cognitive). Artino (2008a) even suggests that online instructors may use a self-regulation assessment of students as a diagnostic tool, adapting their instructional practices based on the results. Similarly, Yukselturk (2009) describes research as showing that successful students are more often associated with an internal locus of control, and that this is a critical success factor for online learning. Motivation is a learner characteristic that is always important to learning. Kim and Frick (2011) looked at motivation in online learning in terms of three factors: internal, external, and personal. Internal factors are features of the individual course, itself. External factors are features of the learning environment, in general. Personal factors relate to the learner's preferences or styles. In the researchers' study, it was found that the relevance of the course content and the technical competency of the learner generated the most motivation in starting online courses. The perceived quality of the instruction was the best motivator during online instruction.

For the purposes of the current research, the learner characteristics of self-regulation, locus of control, and motivation were chosen for further examination. As mentioned previously, all three have been identified by other researchers as being critical to success in online learning environments. It is, therefore, important to define and clarify these concepts. In addition, it was necessary to find suitable instruments to measure these constructs in an online learning environment.

Self-regulation

> According to VandenBos, self-regulation includes the following components.
>
> The control of one's own behavior through the use of self-monitoring (keeping a record of behavior), self-evaluation (assessing the information obtained during self-monitoring), and self-reinforcement (rewarding oneself for appropriate behavior or for attaining a goal). (2009, pp.457-458)

Self-regulation is a broader concept than self-regulated learning. However, self-regulation is sometimes used as a synonym for self-regulated learning. Förster and Liberman (2009) stated, "self-regulation, broadly defined, involves goal pursuit including the more effective use of resources closer to a goal" (p. 147). They also commented on the involvement of motivation in that "the closer one gets to a goal, the higher the motivation and the greater the investment of resources" (p.147). Zimmerman (1986, 1990) described self-regulated learners generally as "metacognitively, motivationally, and behaviorally active participants in their own learning" (1990, p.4).

Zimmerman (1989) delineated three important elements in self-regulated learning: (a) strategies; (b) self-efficacy; and (c) commitments towards academic goals. As defined by Zimmerman (1989), self-regulated learning strategies are "actions and processes directed at acquiring information or skill that involve agency, purpose, and instrumentality perceptions by learners" (p. 329). Strategies can also include cognitive methods such as organizing information, seeking information, and utilizing mnemonic devices (Zimmerman & Martinez-Pons, 1986). Self-efficacy is an individual's perception of his or her ability to perform target objectives or comprehend given knowledge (Bandura, 1986). For example, a learner may be capable of understanding a certain lesson. With low self-efficacy, the learner may not attempt or put in sufficient effort to learn the material. In contrast, learners with high self-efficacy will be more motivated and persist

even when encountering difficulties. Commitments toward academic goals are various reasons learners have for pursuing education. These reasons can include good grades, respect from others, and job offerings after commencement. Some are clearly tangible, while others can involve personal pride or recognition.

Educational psychologist Paul Pintrich (1953-2003) explored various aspects of self-regulated learning in much of his research (Pintrich & DeGroot, 1990; Pintrich, Marx, & Boyle, 1993; Pintrich, 2000). He initially described three important components in the conceptualization of self-regulated learning: (a) strategies for planning, monitoring and modifying cognition; (b) self-management and effort on academic tasks; and (c) cognitive strategies for learning and understanding material (Pintrich & DeGroot, 1990). According to Schunk (2005), one of the major contributions of Pintrich to self-regulated learning was his emphasis on the importance of motivational processes to self-regulation. Even so, Pintrich stated that more research was needed to look at the potentially positive motivational effects of encouraging students to take more control of their learning through the use of various cognitive and self-regulatory strategies (Pintrich, Marx, & Boyle, 1993). In describing the role of goal orientation in self-regulated learning, Pintrich (2000) also felt that more research should be pursued on how other personal characteristics moderated or related to these variables. Psychological characteristics of individuals such as self-efficacy, expertise, or locus of control should be examined. Some characteristics may make individuals less affected by goals, while others may require learners to engage in much more self-regulation.

Pintrich (2000) created a conceptual framework for classifying phases and areas for self-regulation. It contains four phases: (a) forethought, planning, and activation;

(b) monitoring; (c) control; and (d) reaction and reflection. For the learner, these four phases are not connected linearly. They are experienced simultaneously and involve coordination and collaboration in a dynamic fashion. Each phase contains four areas for regulation: (a) cognition; (b) motivation/affect; (c) behavior; and (d) context. Cognition includes skills such as goal setting, selection of cognitive strategies, and cognitive judgments. Examples of motivation/affect are the awareness and monitoring of affect, affective reactions, and attributions. Behavior includes what a learner chooses to do, such as increasing or decreasing effort and persisting versus quitting. Finally, context is knowledge and awareness of the external environment. Although Pintrich grants this is not necessarily an individual characteristic, he notes that monitoring and controlling the environment is seen by some as an important factor for successful learning. According to Pintrich, not all learning follows these phases; some is tacit, implicit, or unintentional on the part of the student. A student may attempt to self-regulate in all these areas, or this may be done by another individual (such as a teacher or peer). The task or features of the educational environment may facilitate or constrain an individual's attempt as self-regulation.

Research on self-regulation generally involves learners reporting on their own behaviors and motivation. Pintrich and De Groot (1990) developed the *Motivated Strategies for Learning Questionnaire* (MSLQ) for studying perceptions of self-regulation. In a correlational study with seventh graders, they examined motivational orientation, self-regulated learning, and academic performance. They found that self-regulation, self-efficacy, and test anxiety were the best predictors of performance. In a follow-up study, Pintrich, Roeser, and DeGroot (1994) examined self-regulated learning

(cognitive strategy use and self-regulation) in conjunction with motivational components (intrinsic value, self-efficacy, and test anxiety). Again, they found that positive motivational beliefs were related to higher levels of self-regulated learning. The researchers also suggest that the relationship is reciprocal; motivation increases self-regulated learning, and self-regulation generates motivation.

Azevedo and Cromley (2004) explored the effectiveness of self-regulated learning strategies with college students using hypermedia for understanding the human circulatory system. They found that the strategies (such as planning, monitoring, and enactment of strategies) improved the students' understanding. However, in this study, the self-regulated group had 30 minutes of training in self-regulated learning strategies prior to their 45-minute educational experience.

Greene and Azevedo (2009) used think-aloud protocols to examine macro-level processes of self-regulated learning (such as planning, monitoring, strategy use, etc.) by secondary students using a hypermedia system. They found that monitoring had a positive effect on performance, particularly in the sophistication of the students' mental models. According to the researchers, these results expanded on earlier work that showed similar benefits from micro-level processes (such as drawing and note taking).

Moos (2010) conducted a study with undergraduate students to examine different levels of self-regulated learning process use. In his study, three categories of use were created based on the frequency of self-regulated learning processes scored by the researcher. Moos found that the students in the low-usage group scored significantly lower on the posttest than the other two, but there was no significant difference between the intermediate- and high-usage groups.

Lee and Tsai (2011) conducted a study in which they investigated college students' perceptions of collaboration, self-regulated learning, and information seeking in both online and traditional face-to-face learning contexts. They found that students perceived higher levels of capability and interest (but not experience) with self-regulated learning in online contexts than in face-to-face environments.

Although many self-regulated learning studies focus on specific lessons, Geddes (2009) looked at how monitoring an online grade book impacted academic achievement. In her study, data from a survey and course of college business students were collected. She found both a preference for and an academic benefit to students monitoring their performance through the online grade book. In non-experimental research like this, one does need to be cautious. Although the monitoring may have been associated with higher performance, the expectation of higher performance (or a related factor) may have been the cause of the increased monitoring, not the opposite.

Kramarski and Michalsky (2009) looked at the effects of self-regulated learning in a hypermedia environment, both with and without metacognitive support. They examined preservice teachers learning pedagogical content with a hypermedia system. Although self-regulated learning had a positive relationship with outcomes in both groups, the addition of metacognitive support in one condition created improved gains.

Green, Costa, Robertson, Pan, and Deekens (2010) examined a group of undergraduates to see if their self-regulation and performance on a learning task were related to their prior knowledge and implicit theory of intelligence (specifically, whether they felt intelligence was essentially inborn or developed through education). They found that the impact of differences in self-regulated learning on posttest scores were much

greater for learners who believed that intelligence was inborn. In other words, the ability or inability to apply self-regulated learning strategies had a more profound impact on the posttest scores of these individuals.

Sansone, Fraughton, Zachary, Butner, and Heiner (2011) were interested in the relationship between goals-defined and experience-defined motivation in self-regulated learning. These researchers created a simulated online environment for undergraduate psychology students. In general, they found that motivated students were more engaged (i.e., performed more interactions) online. In addition, students who were more engaged performed better.

As the previous literature has shown, self-regulated learning covers a range of activities and has been measured by researchers in a number of different ways. A current survey instrument is the *Online Self-regulated Learning Questionnaire* (OLSQ) (Barnard, Lan, To, Paton, & Lai, 2009). This instrument consists of 24 Likert items by which students self-report their self-regulation in online environments. The OSLQ is divided into six subscales: environment structuring, goal setting, time management, help seeking, task strategies, and self-evaluation.

Barnard-Brak, Paton, and Lan (2008) used the OSLQ in their study of online course perceptions. They found that self-regulated learning behaviors were only weakly related to academic achievement. However, self-regulated behaviors did positively mediate between online course communication/collaboration and achievement. The same authors later used the OSLQ in a report of two studies that established five distinct profiles of self-regulated learning (Barnard-Brak, Lan, & Paton, 2010). They named the profiles: super self-regulators, competent self-regulators, forethought-endorsing self-

regulators, performance/reflection self-regulators, and non- or minimal self-regulators. The authors suggest that individuals differ not only in the amount of self-regulating behavior they use, but also in the form that it takes.

Self-regulation is clearly a learner characteristic that is important for success in online learning environments. The OSLQ has been used in a number of studies to specifically address this (Barnard, Lan, To, Paton, & Lai, 2009; Barnard-Brak, Paton, & Lan, 2008; Barnard-Brak, Lan, & Paton, 2010). However, it has not been used in conjunction with other established instruments to further understand how learners perceive the online learning environment.

Locus of Control

Although people generally expect to be rewarded when they perform and less so when they don't, there are differences in individual expectations of reward or reinforcement. Rotter (1966) described that an event was only a reward or reinforcement depending on the reaction of the person receiving it. Specifically, it was important in terms of the degree to which the person felt it was contingent on his or her actions, was controlled by an outside force, or may have occurred independently.

> When a reinforcement is perceived by the subject as following some action of his own, but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control. (Rotter, 1966, p. 1)

Even though internal and external control are explicitly defined, they represent two ends of a continuum. All individuals experience various examples of self-control and are

subject to external forces. Beliefs are also subject to the context of situations. For example, an individual may believe they have more control in the home environment, but are under more external forces in a work or school setting (or vice versa). In measuring locus of control in research settings, individuals are often asked to provide their beliefs about control in a general sense and in the form of self-report. This is a common limitation in much of the research.

Although locus of control would become a widely studied construct, Rotter (1975), himself, cautioned about its use in specific academic settings.

> However, by the time the student is in college; he knows pretty well what the relationship is for him between effort, studying, etc., and grades. What will differentiate his behavior from that of another student with the same ability is apparently motivation or the value placed upon academic achievement reinforcements versus other reinforcements that are competing. (p. 60)

Rotter describes academic achievement (along with motor skills) as the least ambiguous reinforcement situations. One can argue that in the succeeding decades of learner-centered education, constructivism, and online learning, academic achievement is not as structured or clearly reinforced.

In a survey of incoming freshman, Fazey and Fazey (2001) found that the majority had an internal locus of control and rated highly for internal motivation. However, relative differences in internal versus external ratings can be shown to have an effect. Kirkpatrick, Stant, Downes, and Gaither (2008) demonstrated a relationship between locus of control and college student grades. In their sample, students scoring as more internal recorded higher grades than those that were more external. Pascarella, Edison, Hagedorn, Nora, and Terenzini (1996) point out a reciprocal effect in which exposure to and success with college courses led to higher levels of internal locus of

control. In other words, an internal locus of control can lead to achievement, and achievement (particularly as a result of individual action) can strengthen one's belief in an internal locus of control.

Locus of control continues to be studied for a number of reasons. Rotter (1990) cited differing research results for individuals in chance versus skill situations as the initial impetus for his conception of locus of control. He also emphasized that the implication that individuals in situations that "might be considered ambiguous or novel or that had elements of both chance and skill" might approach learning differently is a key feature of locus of control research (Rotter, 1990, p. 490). Online learning environments provide yet another novel (and sometimes ambiguous) situation for students.

Various researchers have studied how locus of control may affect performance. Keller, Goldman, and Stutterer (1978) studied locus of control and study habits in conjunction with a personalized system of instruction course. They found that locus of control was related to student attitudes, but not performance (whereas, study habits affected both). In a study of middle-school students, Lopez and Harper (1989) found that varying learner control in computer-assisted instruction did not have an effect on internal or external learners' performance. However, there was evidence that they didn't use the control to adapt their instruction in any meaningful way. In contrast, Klein and Keller (1990) found that locus of control significantly influenced performance and confidence in a computer-based lesson. Bown (2006) found that learners with an internal locus of control were more likely to be successful in self-instructed language learning than those with an external locus. With regard to online courses, Wang and Newlin (2000) found that an internal locus of control along with a high degree of inquisitiveness and a high

level of online course activity were significant predictors of performance in web-based psychology courses. Chang and Ho (2009) had similar results with a web-based, interactive instructional program. Their results indicated that students with an internal locus of control in the learner-control version of the materials received the highest scores in a posttest. Students with an external locus of control in the program-control version received the lowest scores.

It has also been suggested that locus of control might affect performance indirectly through other factors. Dollinger (2000) found that students with a more internal locus of control had greater awareness of goal-relevant aspects of their environment (such as the instructor's office hours and the points required to earn an A). Whittington (1995) suggested that locus of control might be related to the persistence of students in distance education. In a study of freshman distance education courses at one community college, Parker (1994) found that locus of control was a major factor identified with students that dropped out or persisted in the courses. Students who dropped out were more likely to identify themselves as external. Pugliese (1994) found that locus of control was a better predictor for persistence in a telecourse than loneliness, communication apprehension, and communication competence (although none of the four were statistically significant). Levy (2007) examined locus of control and satisfaction with e-learning in relationship to students dropping out of online classes. He found no impact with regard to locus of control, but there was an effect on e-learning satisfaction. Not surprisingly, students who dropped out of online classes reported lower satisfaction with e-learning. It is important to note that Levy's study looked at undergraduate and graduate students at a major

university, and the overall dropout rate was nearly half that found in Parker's (1994) study.

A number of different instruments have been used to assess a person's locus of control orientation. Rotter (1966) originally presented a 23-item instrument for measuring locus of control called the *Internal-External Scale* (IE). In his instrument, a lower score indicated that the individual had a more internal locus of control; a higher score represented a more external orientation. Furnham and Steele (1993) have reviewed a number of other scales. For example, the *Stanford Preschool Internal-External Control Index* was developed specifically for children between 3 and 6 years old. Brown (1990) developed a 25-item scale which indicates an individual's locus of control regarding internal, external social, and external other factors. The external social indicates perceptions that an individual's own life depends on other powerful people, such as parents and politicians. The external other indicates perceptions that an individual's own life depends on non-social factors, such as luck and fate. This instrument is referred to as the *Brown Locus of Control Scale* (BLOCS).

Brown and Marcoulides (1996) used BLOCS to validate the locus of control construct cross-culturally with American and Kuwaiti women. Their results suggest that BLOCS may be appropriate for people from diverse cultural backgrounds and religious beliefs. BLOCS has been used in a variety of studies (for example, Arikawa, Templer, Brown, Cannon, & Thomas-Dodson, 1999; Mellon, Papanikolau, & Prodromitis, 2009). In short, BLOCS has demonstrated reliability and validity. It also has an advantage in distinguishing between social and other aspects of an external orientation.

Locus of control is a learner characteristic that has been studied extensively, but whose relationship with success in individualized instruction is mixed. Some researchers have found no relationship between locus of control and performance (Keller, Goldman, & Stutterer, 1978; Lopez & Harper, 1989). Others have found that learners with an internal locus of control do perform better in individualized environments (Klein & Keller, 1990; Bown, 2006; Chang & Ho, 2009; Wang & Newlin, 2000). Research has also shown that locus of control is related to persistence in online courses (Parker, 1994; Pugliese, 1994) and satisfaction with them (Levy, 2007). Further exploring locus of control and its relationship to other learner characteristics is valuable in understanding how learners perform in online learning environments.

Motivation

A key factor in any learning situation is understanding a learner's motivation. Förster and Liberman (2009) define motivation "as a product of habit and drive, where drive is equivalent to the extent of need (e.g., hunger, pain) and habit is the strength of association between action and outcome" (p.148). VandenBos (2009) describes motivation as "the impetus that gives purpose or direction to human or animal behavior and operates at a conscious of [sic] unconscious level" (p. 307). VandenBos also distinguishes between internal motivating forces and external factors, such as rewards or punishments, in determining behavior. In describing social learning, Bandura (1977) noted the importance of models and processes, which included attention, retention, motor reproduction, and motivation. Although Bandura emphasized how learners naturally

model their behavior on the behavior of others, they still required motivation to do so. Eyck (2008) indicated,

> If people do not believe that learning behavior is important, or they do not find the potential reward appealing, then they will not likely be motivated sufficiently to learn the behavior. Thus, a lack of interest could lead to poor attention or retention, which could translate into an intentional failure to learn the modeled behavior. (p. 356)

Motivation can be decomposed into different elements and is also intertwined with other factors. Hidi and Harackiewicz (2000) identify interests and goals as the two most important variables in motivational research. They also stressed the importance of all motivators.

> Although we acknowledge the positive effects of individual interest, intrinsic motivation, and the adoption of mastery goals, we urge educators and researchers to recognize the potential additional benefits of externally triggered situational interest, extrinsic motivation, and performance goals. (p.151)

Barak (2010) describes self-regulated learning as being composed of cognition, meta-cognition, and motivation. In his model, motivation consists of interest, intrinsic motivation, and self-efficacy beliefs.

In the field of educational communications and technology, Seel (2008) provided a comprehensive review of memory and motivation. Seel describes three main approaches to describing learning with media and motivation: schema-based; flow, engagement, and self-efficacy; and uses and gratifications.

In schema-based approaches, motivation can be the result of arousal when incoming information is novel (i.e., it does not fit into existing schemata).

> The basic assumption of schema-based research on motivation is that deep comprehension occurs when learners confront contradictions, anomalous events, obstacles to goals, salient contrasts, perturbations, surprises, equivalent alternatives, and other stimuli or experiences that fail to match schema-based expectations. (Seel, 2008, p. 49)

Flow, engagement, and self-efficacy refer to approaches in which a person's affective states systematically influence the processing of new material. "Because a person's affective state is linked to their motivation level, intrinsically motivated learners who are engaged should demonstrate more engagement and persistence in performing tasks" (Seel, 2008, p.50). For example, Csikszentmihalyi (1990) defines flow as a state of complete absorption or engagement in an activity leading to an optimal experience.

The uses-and-gratifications approach is a traditional perspective that focuses on why individuals use a particular medium or technology. Seel (2008) noted that this approach has most recently been applied to the World Wide Web as a form of mass media.

Initially, motivation plays a role in how learners choose educational options. Often extrinsic motivation is in the forefront, but the influence of intrinsic motivators is always important. For example, Hooper (2009) studied how mid-career students--not continuous from high school to college--gained confidence in courses and programs and then achieved their goals in higher education. His research found that involvement in the learning process played an important role in developing intrinsic motivators for the learners. These, in turn, led to greater personal satisfaction, deeper learning, and self-actualization.

Persistence in educational settings involves the interplay of motivation and other factors, such as performance and self-regulation. Ning and Downing (2010) explored self-regulation, motivation, and academic achievement in a Hong Kong university. They assessed over 500 first-year business undergraduates during a 15-month period. The

researchers found that self-regulation predicted motivation and that motivation was the strongest predictor of academic performance.

Researchers are also concerned with how online environments may present different motivational challenges to learners. In a study of perceptions of online training, Artino (2008b) reported that task value, self-efficacy, and perceived instructional quality were significantly related to each other and to overall satisfaction with a self-paced, online course. These results demonstrated that motivation is not only affected by perceptions of quality, but also by the value learners assign to the material and their beliefs regarding its utility. Palmer and Holt (2009) also conducted a survey to gauge factors contributing to students' perceptions of satisfaction with online units of study. They found that the factors that contributed the most to positive ratings of student satisfaction were confidence in the ability to communicate and learn online, having a clear understanding of what was required to succeed in the unit, and knowledge of how well they were performing in the unit. This survey confirmed that knowledge of expectations, belief in the ability to meet those expectations, and monitoring of performance towards those expectations contribute to motivation.

Although various researchers have approached motivation from a variety of perspectives, Keller (1987) developed the ARCS model as a theoretical framework for defining different aspects of motivation in a way that is easily understood, but that could be applied in any context. ARCS stands for attention, relevance, confidence, and satisfaction. According to Keller, each factor applies to any educational event. He assumed that learners' effort produces a positive motivational outcome after two conditions are fulfilled: (a) the person must value the task, and (b) the person must

believe he or she can succeed at the task. The ARCS model delineates learners' beliefs regarding motivational characteristics of a learning situation and/or materials. Each factor of the model is described in more detail below.

The first factor in ARCS is attention. Without the attention of the individual, learning cannot begin. Attention can be generated by the learner (internally) or can be inspired by an instructor or materials (externally). Well-designed instruction provides external prompts for attention to support those learners that need them. Attention should not be thought of as a light switch that is on or off; during learning, attention may result in highly focused behavior at times and less concentration at others. Attention is also important in how it focuses a learner's efforts. Attention-getting devices not related to the content will likely not have as much impact as attention focusing on aspects of the learning event.

The second factor in ARCS is relevance. This involves matching the learners' experience with the learning task. Relevance between a learner's past experience or future expectations and materials provides a strong motivation for learning. In terms of past experience, relevance can be in the form of familiar contexts or examples for learning. Learners are also more motivated if they can see how new information and skills will be applied in the future. This is another form of relevance.

The third factor in ARCS is confidence. Confidence is how learners perceive their own expectancy for success or achievement. In this case, the confidence is not in actual performance, but rather in their belief that the materials or environment will lead the learner to be able to perform in the future. This is similar to self-efficacy, but self-efficacy is generally considered from the learners' perspective in terms of the ability to

affect an outcome. Keller considers confidence more from the perspective of learners interacting with a learning environment. For example, poorly designed materials that appear too complex may instill in learners a lack of confidence that they will be able to learn the content. Many students have a single instructional anecdote that led them to drop an interest or classify themselves as "not good at . . ." (a field of study).

The fourth factor in ARCS is satisfaction. Satisfaction is how learners have fulfilled intrinsic and/or extrinsic reinforcement after a learning event. Intrinsic satisfaction includes feelings of achievement, success, and completion. Extrinsic reinforcement might be in the form of a college degree, career advancement, or recognition from others. Whether intrinsic or extrinsic, this reinforcement may be directly related to the content (such as pride in being able to perform a new skill), or it may be secondary to the learning (such as enjoying positive interactions with an instructor or peers). In general usage, motivation is often described mainly from the perspective of satisfaction. However, in Keller's model, satisfaction has equal status with attention, relevance, and confidence. It is important to not equate satisfaction with happiness (as some do in popular culture). Although happiness is a form of satisfaction, it is only one. Many learning experiences can be grueling, demanding, and stressful, but also satisfying (for example, training to be a firefighter or an Olympic athlete).

The ARCS model has been used to design and test instructional materials and curricula. Astleitner and Lintner (2004) used the ARCS model to implement motivation strategies in an instructional textbook. They found that the strategies improved personal evaluations of the learning process with respect to experience and preference, but also had negative effects on incentives and perceived control. Wongwiwatthananukit and

Popovich (2000) demonstrated how the ARCS model could be used to analyze possible motivators for learners and develop motivational objectives. Kim & Keller (2008) investigated the effect of personal email messages on learners' motivation, study habits, and achievement in a large face-to-face undergraduate course. They found that the students receiving personalized, ARCS-oriented messages from the course instructor reported higher levels of motivation, especially in regard to confidence, than the group receiving non-personal messages. There was no difference in study habits. It should be noted that those receiving the personalized messages had been selected due to an initial reporting of lower levels of satisfaction with the course.

Keller (1987) eventually developed an instrument to specifically measure learner's perceptions of ARCS factors in instructional materials. His Instructional *Materials Motivation Survey* (IMMS) contains a total of 36 items. The items are each scored on a 5-point Likert scale. The survey can be scored for each of the four subscales (attention, relevance, confidence, and satisfaction) or can be used to generate an overall motivation score.

Song and Keller (2001) used a version of the IMMS to examine the effectiveness of three computer-assisted instruction strategies: (a) motivationally adaptive, (b) motivationally saturated, and (c) motivationally minimized. They found that the motivationally adaptive instruction was more effective in terms of overall motivation and attention. Lim, Reiser, and Olina (2009) used the IMMS to assess motivation in comparing whole-task and part-task instructional approaches during classroom instruction. Although they found that the whole-task group performed better on skill acquisition and transfer tests, there were no differences in terms of any of the motivation

scales. Pittenger and Doering (2010) examined online, self-study courses with high completion rates and found that they also rated highly on motivation as measured by the IMMS.

Motivation is a learner characteristic that has been studied extensively. Its importance to learning is intuitively obvious and has been confirmed by empirical research. Keller's (1987) ARCS model is a theoretical framework for motivation that is easy to understand, but also provides many practical applications and research value. Keller's (2010) *Instructional Materials Motivation Survey* (IMMS) provides a ready instrument for assessing attention, relevance, confidence, and satisfaction. Further exploring the relationship of these motivational factors with other learner characteristics is valuable in understanding how learners perform in online learning environments.

Summary

This chapter reviewed the importance of online learning environments to higher education. It described how the study of learner behaviors and attitudes, specifically within the context of online environments, will assist in positive learning outcomes. Although many online learner characteristics potentially affect performance, this chapter described the rationale for choosing self-regulation, locus of control, and motivation to examine in this study. Each factor was defined and relevant research was cited. The next chapter describes the specific research methodology in detail.

CHAPTER III

METHODOLOGY

This study examined how students' perceptions of self-regulation, locus of control, and motivation were related in online learning environments. This was accomplished through a survey administered to participants in online courses. This chapter provides the details of the methodology used. It is organized into: participants, instrumentation, procedures, research design, and data analysis.

Participants

The participants were 73 preservice teachers who were enrolled in two online technology courses at a mid-sized western public university. Their ages ranged from approximately 18 to 40 years old. The courses are not open to freshmen and are typically taken during the sophomore and junior years. A total of 211 students were enrolled in the courses, and 73 voluntarily completed the study (34.60%). Another 11 (5.21%) had started the survey, but their data were not used, as they were incomplete.

Both courses focused on the use of technology in K-12 classrooms. The course descriptions from the *University Catalog* state, "Instruction and practice using a variety of technology tools. Focus on the application of these tools (intellectual freedom, critical viewing skills, technology access and equity) within the [elementary or secondary] classroom" (p. 244). The elementary education course had 133 enrolled students; 10 (7.52%) were male, and 123 (92.48%) were female. The secondary education course had

78 enrolled students; 21 (26.92%) were male, and 57 (73.08%) were female. The gender breakdown for both courses was 31 (14.69%) male and 180 (85.31%) female. Because it was not related to any of the research questions, the gender and grade-level specialty of the participants were not recorded in the survey.

During the semester that this study took place, 273 online courses were offered through the Blackboard LMS at this university (Table 1). In addition, the university's extended studies office provided 32 online programs--not online courses--during the same period.

Table 1

Course and Enrollment Comparison of Face-to-face Courses with Online Courses

	On-site Courses		Online Courses	
Education Level	No. of Courses	Course Enrollment	No. of Courses	Course Enrollment
Undergraduate	1,977	49,236	159	3,138
Graduate	387	3,674	114	1,114
Total	2,364	52,910	273	4,252

Instrumentation

The participants received 85 Likert-type questions during a single survey administration. This survey was created by combining in their entirety the *Online Self-regulated Learning Questionnaire* (OSLQ), *Brown's Locus of Control Scale* (BLOCS), and the *Instructional Materials Motivation Survey* (IMMS). Each of these separate instruments is described below.

The *Online Self-regulated Learning Questionnaire* (OSLQ) was developed to measure self-regulated learning behavior in online environments (Barnard, Lan, To,

Paton, & Lai, 2009). The OSLQ consists of 24 items measured on a 5-point Likert scale, ranging from *strongly disagree* to *strongly agree* (see Appendix A). The OSLQ consists of six subscales: goal setting (five items), environment structuring (four items), task strategies (four items), time management (three items), help seeking (four items), and self evaluation (four items).

In a study with 204 online students, Barnard et al. (2009) reported internal reliabilities for the OSLQ of .95 (goal setting), .92 (environment structuring), .93 (task strategies), .87 (time management), .96 (help seeking), and .94 (self evaluation). In the current study, the internal reliabilities for the OSLQ were recorded as: .80 (goal setting), .90 (environment structuring), .56 (task strategies), .51 (time management), .74 (help seeking), and .60 (self evaluation).

The validity of the OSLQ has been established in a number of empirical studies by Barnard and her colleagues. It was used in a study of online course perceptions (Barnard-Brak, Paton, & Lan, 2008). It has been used in a comparison of blended and fully online courses (Barnard, Lan, To, Paton, Lai, 2009). It was used to help establish profiles of self-regulated learning (Barnard-Brak, Lan, & Paton, 2010). The OSLQ also has face validity in that the items (e.g., "I set standards for my assignments in online courses.") are relatively straightforward, appear to address self-regulation, and reflect beliefs that could be measured by self-report.

Brown's Locus of Control Scale (BLOCS) was developed to measure various aspects of locus of control in learning environments (Brown, 1990). All 25 items of BLOCS were measured by a 6-point Likert scale, ranging from *very strongly disagree* to

very strongly agree (see Appendix B). BLOCS consists of three subscales: internal (nine items), external social (seven items), and external other (seven items).

In a study with 92 students, Brown (1983) reported test-retest reliabilities of .88 (internal), .91 (external social), and .84 (external other). In the same study, he reported internal reliabilities of .74 (internal), .71 (external social), and .66 (external other). In the current study, the internal reliabilities for BLOCS were recorded as: .56 (internal), .68 (external social), and .62 (external other).

Brown (1990) cited a number of studies that have established the construct validity of BLOCS through "factor analysis, relationships with other forms measuring locus of control, and relationships with other psychological variables" (p. 378). He also demonstrated concurrent validity of BLOCS by citing additional studies in which it had been used with a number of other psychological variables. It has been widely used in a variety of contexts (e.g., Brown & Marcoulides, 1996; Arikawa, Templer, Brown, Cannon, & Thomas-Dodson, 1999; Mellon, Papanikolau, & Prodromitis, 2009). Like the previous instrument, BLOCS also has face validity in that the items (e.g., "My friendships depend on how well I relate to others.") are relatively straightforward, appear to address locus of control, and reflect beliefs that could be measured by self-report.

The IMMS was developed to measure different motivational aspects of instructional materials (Keller, 2010). All 36 items of the IMMS were measured by a 5-point Likert scale, ranging from *not true* to *very true* (see Appendix C). The IMMS consists of four subscales: attention (12 items), relevance (9 items), confidence (9 items), and satisfaction (6 items).

In a study with 90 preservice teaching students, Keller (2010) reported internal consistencies for the IMMS of .89 (attention), .81 (relevance), .90 (confidence), and .92 (satisfaction). In the current study, the internal reliabilities for the IMMS were recorded as .83 (attention), .90 (relevance), .76 (confidence), and .88 (satisfaction).

Keller (2010) tested the validity of the IMMS through the comparison of two sets of instructional materials (one of which was enhanced specifically according to the ARCS guidelines). The students receiving the enhanced materials reacted accordingly on the IMMS. The IMMS has been validated through a number of different research studies (e.g., Song & Keller, 2001; Lim, Reiser, & Olina, 2009; Pittenger & Doering, 2010).). As with the previous instruments, the IMMS has face validity in that the items (e.g., "When I first looked at this lesson, I had the impression that it would be easy for me.") are relatively straightforward, appear to address motivation, and reflect beliefs that could be measured by self-report.

Procedures

The two online courses used in this study were selected as a convenience sample. They were representative of fully online courses in technology for preservice teachers within the university's college of education. All the students enrolled in those courses during the semester were eligible for the study (there were no multiple sections).

The Blackboard LMS was used as the sole delivery medium for the courses. During the 15-week semester, the students had online reading assignments, participated in discussion activities, created technology-based lesson plans, worked on small group projects, produced a digital storytelling video, and completed a final exam.

During the last two weeks of the semester, an announcement was posted in the LMS soliciting their participation and providing a link to the survey. When a student clicked on the link, the informed consent letter was presented. Participants indicated their consent by continuing on to the survey. The three instruments (OSLQ, BLOCS, and IMMS) were then shown as 85 sequential items. Participants could quit the survey at any time (11 incomplete submissions were received, indicating either the participant quit or perhaps had technical difficulties such as a network outage). The data collection was implemented as an anonymous survey within the LMS, so personal information on participants was not available to the researcher or instructor (including knowledge of who did or did not complete the survey).

All the students in the two online courses were given an opportunity to volunteer as participants in the study. There were no rewards given for completing the survey, nor were their any punishments or negative consequences for not participating. At the end of the semester (two weeks later), the survey became unavailable to students, and the data were downloaded for analysis.

Research Design

This research is a descriptive correlational study utilizing a survey of self-reported factors. A descriptive correlational study is an ex post facto design in which two or more sets of data from a group of subjects is analyzed in an attempt to determine the relationship between them (Tuckman, 1999). Although descriptive correlational studies are not adequate for establishing causal relationships among variables, they are useful for determining relationships among measures and suggesting causal links.

This research used a survey of self-reported factors. According to Tuckman (1999), self-reported questionnaires present three main problems: (a) participants must cooperate to complete the questionnaire, (b) participants must tell what is, rather than what they think ought to be, or what they think the researcher wants to hear, and (c) participants must know what they feel and think in order to report it. In the current study, 34.60% of the available students completed the survey (another 5.21% started, but did not complete it). This number was acceptable, but could have been larger. For the current instruments, it seemed unlikely that participants would exaggerate or falsify their responses. Also, the participants as mid-level college students would clearly be able to reflect upon and report their behaviors and thoughts regarding self-regulation, locus of control, and motivation.

Data Analysis

For each of the three instruments (OSLQ, BLOCS, and IMMS), individual means and standard deviations of all items are reported. The means and standard deviations for the various subscales are reported.

In order to answer the first research question (“Does locus of control correlate with motivation in an online course?”), Pearson product-moment correlation tests were conducted for each pair of locus of control and motivation subscales. This resulted in 12 correlations.

In order to answer the second research question (“Does locus of control correlate with self-regulated learning in an online course?”), Pearson product-moment correlation tests were conducted for each pair of locus of control and self-regulated learning subscales. This resulted in 18 correlations.

In order to answer the third research question ("Does learners' motivation correlate with self-regulated learning in an online course?"), Pearson product-moment correlation tests were conducted for each pair of motivation and self-regulated learning subscales. This resulted in 24 correlations.

Addressing all three research questions required 54 statistical tests. In order to control for the inflation of experiment-wise error rate, a single-stage Bonferroni adjustment was made to the individual tests (Collis & Rosenblood, 1985). An overall alpha level of .10 was desired. This more liberal level was selected because of the exploratory nature of the study and the lack of serious, negative consequences for a false positive. In other words, a suggestion of a relationship between measures would still need verification through more rigorous experimental or quasi-experimental study. Establishing an individual alpha level of .002 for the 54 tests provided an experiment-wise error rate of not more than .108, which was deemed acceptable.

CHAPTER IV

RESULTS

The total number of enrolled preservice teachers in both online courses was 214. Surveys were completed by 73 participants (34.11%). There were three instruments used in this study: *Brown's Locus of Control Scale* (BLOCS), the *Instructional Materials Motivation Survey* (IMMS), and the *Online Self-regulated Learning Questionnaire* (OSLQ). The results for each will be described below.

BLOCS

The 25 locus of control items and their descriptive statistics are presented in Table 2. The scale used for these items ranged from 1 (*Very Strongly Disagree*) to 6 (*Very Strongly Agree*). Using Cronbach's alpha, the reliability of the BLOCS instrument was .67. The subscale reliabilities were also calculated: internal (α = .56); external social (α = .68); and external other (α = .62).

Table 2

Brown's Locus of Control Items and Descriptive Statistics

Item	Subscale*	Ave. (s.d.)
1. My friendships depend on how well I relate to others.	XS	4.63 (0.84)
2, Accidental happenings have a lot to do with my life.	XO	3.38 (1.15)
3. Rules and practices that have been around for many years should determine what will happen to my life.	XO	3.11 (0.92)
4. I am fairly able to determine what will happen to my life.	IN	3.93 (1.07)
5. Religious faith will get me through hard times.	XO	3.93 (1.78)
6. The government will run whether I get involved or not.	XS	3.58 (1.09)
7. Getting ahead is a matter of pleasing people in power.	XS	3.11 (1.01)
8. Generally, it's not what I know, but who I know.	XS	3.67 (0.76)
9. I make mistakes—accidents just don't happen.	IN	3.41 (0.6)
10. Being in the right place at the right time is important for my success.	XS	3.55 (0.85)
11. My friends often determine my actions.	XS	2.77 (1.09)
12. The ideas about life that have been around since time began have an influence on my life.	XO	3.34 (0.93)
13. Most of the time, I control what happens in my life.	IN	4.40 (0.76)
14. Strong pressure groups determine my role in society.	XS	2.62 (0.95)
15. My plans will not work unless they fit into the plans of those in power.	XS	2.67 (0.94)

Table 2 (continued)

Item	Subscale*	Ave. (s.d.)
16. My close relationships with people don't just happen—they need to be worked on.	IN	4.22 (1.02)
17. Some powerful force or person predetermined most of what happens in my life.	XO	2.99 (1.42)
18. My life is often affected by fate.	XO	3.27 (1.17)
19. My actions determine my life.	IN	4.81 (0.84)
20. Hard work will get me where I want to go.	IN	5.14 (0.80)
21. I can generally take care of my personal interests.	IN	4.73 (0.82)
22. I have to work with others to get a job done.	IN	3.49 (1.09)
23. My ability without pleasing people in power makes little difference.	XS	3.12 (0.91)
24. My life is often affected by luck.	XO	2.97 (0.82)
25. I can usually carry out plans that I make for myself.	IN	4.60 (0.72)
All Internal Items (n = 9)	IN	4.30 (0.43)
All External Social Items (n = 9)	XS	3.30 (0.50)
All External Other Items (n = 7)	XO	3.29 (0.67)

*IN = Internal; XS = External Social' XO = External Other.

IMMS

The 36 items of IMMS and their descriptive statistics are presented in Table 3. The scale used for these items ranged from 1 (*Not True*) to 5 (*Very True*). Using

Cronbach's alpha, the reliability of the IMMS instrument was .94. The subscale reliabilities were also calculated: attention (α = .83); relevance (α = .89); confidence (α = .76); and satisfaction (α = .88).

Table 3

Instructional Materials Motivation Survey Items and Descriptive Statistics

Item	Subscale*	Ave. (s.d.)
1. When I first looked at this lesson, I had the impression that it would be easy for me.	CN	3.36 (1.05)
2. There was something interesting at the beginning of this lesson that got my attention.	AT	2.48 (1.03)
3. This material was more difficult to understand than I would like for it to be.	CN	4.01 (1.09)
4. After reading the introductory information, I felt confident that I knew what I was supposed to learn from this lesson.	CN	3.22 (1.15)
5. Completing the exercises in this lesson gave me a satisfying feeling of accomplishment.	SA	3.03 (1.26)
6. It is clear to me how the content of this material is related to things I already know.	RE	3.23 (1.21)
7. Many of the pages had so much information that it was hard to pick out and remember the important points.	CN	3.44 (1.24)
8. The materials are eye-catching.	AT	2.41 (1.05)
9. There were stories, pictures, or examples that showed me how this material could be important to some people.	RE	2.84 (1.19)

Table 3 (continued)

Item	Subscale*	Ave. (s.d.)
10. Completing this lesson successfully was important to me.	RE	3.60 (1.32)
11. The quality of the writing helped to hold my attention.	AT	2.63 (1.15)
12. This lesson is so abstract that it was hard to keep my attention on it.	AT	3.92 (1.11)
13. As I worked on this lesson, I was confident that I could learn the content.	CN	3.56 (1.04)
14. I enjoyed this lesson so much that I would like to know more about this topic.	SA	2.18 (1.08)
15. The pages of this lesson look dry and unappealing.	AT	3.74 (1.17)
16. The content of this material is relevant to my interests.	RE	2.93 (1.23)
17. The way the information is arranged on the pages helped keep my attention.	AT	2.41 (1.00)
18. There are explanations or examples of how people use the knowledge in this lesson.	RE	2.89 (1.21)
19. The exercises in this lesson were too difficult	CN	4.29 (1.02)
20. This lesson has things that stimulated my curiosity.	AT	2.70 (1.19)
21. I really enjoyed studying this lesson	SA	2.48 (1.12)
22. The amount of repetition in this lesson caused me to get bored sometimes.	AT	3.16 (1.20)

Table 3 (continued)

Item	Subscale*	Ave. (s.d.)
23. The content and style of writing in this lesson convey the impression that its content is worth knowing.	RE	3.11 (1.11)
24. I learned some things that were surprising or unexpected.	AT	2.95 (1.22)
25. After working on this lesson for awhile, I was confident that I would be able to pass a test on it.	CN	3.33 (1.20
26. This lesson was not relevant to my needs because I already knew most of it.	RE	3.79 (1.20)
27. The wording of feedback after the exercises, or of other comments in this lesson, helped me feel rewarded for my effort.	SA	2.38 (1.17)
28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the lesson.	AT	2.51 (1.09)
29. The style of writing is boring.	AT	3.66 (1.04)
30. I could relate the content of this lesson to things I have seen, done, or thought about in my own life.	RE	3.07 (1.15)
31. There are so many words on each page that it is irritating.	AT	3.95 (1.12)
32. It felt good to successfully complete this lesson.	SA	3.56 (1.13)
33. The content of this lesson will be useful to me.	RE	3.29 (1.18)
34. I could not really understand quite a bit of the material in this lesson.	CN	4.08 (1.13)

Table 3 (continued)

Item	Subscale*	Ave. (s.d.)
35. The good organization of the content helped me be confident that I would learn this material.	CN	2.85 (1.14)
36. It was a pleasure to work on such a well-designed lesson.	SA	2.64 (1.08)
All Attention Items (n = 12)	AT	3.04 (0.66)
All Relevance Items (n = 9)	RE	3.19 (0.88)
All Confidence Items (n = 9)	CN	3.57 (0.66)
All Satisfaction Items (n = 6)	SA	2.71 (0.91)
All Items (n = 36)		3.13 (0.68)

*AT = Attention; RE = Relevance; CN = Confidence; SA = Satisfaction.

OSLQ

The 24 items of the *Online Self-regulated Learning Questionnaire* and their descriptive statistics are presented in Table 4. The scale used for these items ranged from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Using Cronbach's alpha, the reliability of the OSLQ instrument was .89. The subscale reliabilities were also calculated: goal setting (α = .80); environment structuring (α = .90); task strategies (α = .56); time management (α = .51); help seeking (α = .74); and self evaluation (α = .60).

Table 4

Online Self-regulated Learning Questionnaire Items and Descriptive Statistics

Item	Subscale*	Ave. (s.d.)
1. I set standards for my assignments in online courses.	GS	3.84 (0.96)
2. I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).	GS	4.04 (0.79)
3. I keep a high standard for my learning in my online courses.	GS	3.79 (0.91)
4. I set goals to help me manage studying time for my online courses.	GS	3.79 (0.91
5. I don't compromise the quality of my work because it is online.	GS	3.71 (1.03)
6. I choose the location where I study to avoid too much distraction.	ES	3.67 (0.96)
7. I find a comfortable place to study.	ES	3.96 (0.82)
8. I know where I can study most efficiently for online courses.	ES	3.89 (0.97)
9. I choose a time with few distractions for studying for my online courses.	ES	3.89 (0.83)
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.	TS	2.67 (1.11)
11. I read aloud instructional materials posted online to fight against distractions.	TS	2.95 (1.12)
12. I prepare my questions before joining in the chatroom and discussion.	TS	3.41 (1.04)

Table 4 (continued)

Item	Subscale*	Ave. (s.d.)
13. I work extra problems in my online courses in addition to the assigned ones to master the course content.	TS	2.48 (1.00)
14. I allocate extra studying time for my online courses because I know it is time-demanding.	TM	3.01 (1.15)
15. I try to schedule the same time every day or every week to study for my online courses, and I observe the schedule.	TM	3.48 (0.99)
16. Although we don't have to attend daily classes, I still try to distribute my studying time evenly across days.	TM	2.99 (1.14)
17. I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.	HS	3.21 (1.11)
18. I share my problems with my classmates online so we know what we are struggling with and how to solve our problems.	HS	2.95 (1.20)
19. If needed, I try to meet my classmates face-to-face.	HS	3.23 (1.09)
20. I am persistent in getting help from the instructor through e-mail.	HS	3.56 (0.94)
21. I summarize my learning in online courses to examine my understanding of what I have learned.	SE	3.12 (0.97)
22. I ask myself a lot of questions about the course material when studying for an online course.	SE	3.26 (0.99)
23. I communicate with my classmates to find out how I am doing in my online classes.	SE	3.11 (1.17)

Table 4 (continued)

Item	Subscale*	Ave. (s.d.)
24. I communicate with my classmates to find out what I am learning that is different from what they are learning.	SE	3.05 (1.12)
All Goal Setting Items (n = 5)	GS	3.84 (0.69)
All Environment Structuring Items (n = 4)	ES	3.85 (0.78)
All Task Strategies Items (n = 4)	TS	2.88 (0.70)
All Time Management Items (n = 3)	TM	3.16 (0.78)
All Help Seeking Items (n = 4)	HS	3.24 (0.81)
All Self-Evaluation Items (n = 4)	SE	3.14 (0.72)
All Items (n = 24)		3.35 (0.54)

* GS = Goal Setting; ES = Environment Structuring, TS = Task Strategies; TM = Time Management; HS = Help Seeking; SE = Self-Evaluation.

Research Question 1

Q1 Is there a relationship between a learner's locus of control and motivation in an online course?

In order to determine if there was a relationship between locus of control and motivation, Pearson product-moment correlation tests were conducted for each pair of locus of control and motivation subscales. The results of these tests are presented in Table 5. There were no significant correlations found between any of the three locus of control subscales and the four motivation subscales.

Table 5

Pearson Correlations between BLOCS and IMMS (n = 73)

		IMMS[2]			
BLOCS[1]		AT	RE	CN	SA
IN	r	.17	.29	.27	.19
	p-value	.158	.012	.019	.100
XS	r	.20	.16	-.14	.24
	p-value	0.97	.175	.223	.040
XO	r	.06	.07	-.07	.21
	p-value	.640	.541	.562	.080

[1]IN = internal; XS = external social; XO = external other.

[2]AT = attention; RE = relevance; CN = confidence; SA = satisfaction.

Note: To control for inflation of error rate, each individual correlation was tested with α = .002 (providing a study-wide α of not more than .108 for the 54 correlations).

Research Question 2

Q2 Is there a relationship between a learner's locus of control and self-regulated learning in an online course?

In order to determine if there was a relationship between locus of control and self-regulated learning, Pearson product-moment correlation tests were conducted for each pair of locus of control and self-regulated learning subscales. The results of these tests are presented in Table 6. There were no significant correlations found between any of the three locus of control subscales and the six self-regulated learning subscales.

Table 6

Pearson Correlations between BLOCS and OSLQ (n = 73)

		OSLQ[2]					
BLOCS[1]		GS	ES	TS	TM	HS	SE
IN	r	.19	.15	.12	.09	.16	.14
	p-value	.101	.196	.314	.439	.185	.246
XS	r	.14	.09	.06	.11	.10	.18
	p-value	.038	.435	.596	.335	.384	.128
XO	r	.10	-.15	.15	-.03	.04	.20
	p-value	.081	.657	.197	.774	.737	.089

[1]IN – internal; XS = external social; XO = external other.

[2]GS = goal setting; ES = environment structuring; TS = task strategies; TM = time management; HS = help seeking; SE = self evaluation.

Note: To control for inflation of error rate, each individual correlation was tested with α = .002 (providing a study-wide α of not more than .108 for the 54 correlations).

Research Question 3

Q3 Is there a relationship between a learner's motivation and self-regulated learning in an online course?

In order to determine if there was a relationship between motivation and self-regulated learning, Pearson product-moment correlation tests were conducted for each pair of motivation and self-regulated learning subscales. The results of these tests are presented in Table 7.

Table 7

Pearson Correlations between IMMS and OSLQ (n = 73)

		OSLQ[2]					
IMMS[1]		GS	ES	TS	TM	HS	SE
AT	r	.28	.32	.54	.52	.24	.28
	p-value	.016	.006	<,001*	<.001*	.043	.017
RE	r	.41	.32	.43	.37	.13	.30
	p-value	<.001*	.006	<.001*	.001*	.282	.011
CN	r	..45	.46	.41	.36	.24	.23
	p-value	.<.001*	<.001*	<.001*	.001*	.039	.052
SA	r	.41	.34	.52	.48	.19	.40
	p-value	<.001*	.003	<.001*	<.001*	.100	.001*

*Significant at .002 level/

[1]AT = attention; RE = relevance; CN = confidence; SA = satisfaction.

[2]GS = goal setting; ES = environment structuring; TS = task strategies; TM = time management; HS = help seeking; SE = self evaluation.

Over half (13 of 24) of the correlations between the four motivation subscales and the six self-regulated learning subscales were significant. The task strategies and time management subscales were significantly correlated with each motivation factor. Goal setting was significantly correlated with three of the factors, but not attention. On an individual level, environment structuring was significantly correlated with confidence; self-evaluation was significantly correlated with satisfaction. All of the significant correlations were positive, but low to moderate in strength of relationship (ranging

from .36 to .54). It's also interesting to note that help seeking was not significantly correlated with any of the motivation factors.

CHAPTER V

DISCUSSION

The purpose of this study was to examine how students' self-regulation, locus of control, and motivation levels were related in online learning environments. Motivation was measured with the *Instructional Materials Motivation Survey* (IMMS, Appendix B). It consisted of four subscales (attention, relevance, confidence, and satisfaction). Locus of control was measured with *Brown's Locus of Control Scale* (BLOCS, Appendix A). It consisted of three subscales (internal, external social, and external other). Self-regulated learning was measured with the *Online Self-regulated Learning Questionnaire* (OSLQ, Appendix C). It consisted of six subscales (goal setting, environmental structuring, task strategies, time management, help seeking, and self evaluation).

Participants were drawn from 200 preservice teachers who were enrolled in two online educational technology courses of the Spring 2011 semester at a medium-sized university. A total of 73 participants completed the questionnaires associated with the study. The results were mixed. Although the data support and expand our knowledge of online learners, it raises additional questions. The following discussion is organized around the three main research questions.

Research Question 1

Q1 Is there a relationship between a learner's locus of control and motivation in an online course?

The current study failed to find a relationship between locus of control and motivation. This finding did not support the work of Fazey and Fazey (2001) who found a significant relationship between internal locus of control and internal motivation. It is interesting to note that although they found this to be true, they also noted that students recognized that they were sometimes successful (or not) for reasons not under their control.

Keller, Goldman, and Stutterer (1978) also found a relationship between locus of control and student attitude, but noted no relationship between locus of control and performance. These researchers suggested that locus of control is more important in its impact on attitudes than on performance. Klein and Keller (1990) later did find influence between locus of control and performance in computer-assisted instruction. In that study, the researcher found that while type of instructional control (program versus learner) did not affect performance, locus of control did. The issue of instructional control is particularly important for online learning environments.

Lopez and Harper (1989) found no relationship between locus of control and the amount of learner control in computer-assisted instruction. However, they were surprised that those designated as demonstrating a more internal locus of control did not exert more effort in the learner control condition.

The effect of locus of control on dropout rates for e-learning courses is also mixed. Parker (1999) indicated that locus of control was a predictor of the dropout rate of students in courses taught at a distance. Students who showed high levels of internal locus of control were less likely to drop out of the course. On the other hand, Levy (2007) found no effect for locus of control on dropout rate.

The literature justified the examination of locus of control in this study of users of online learning environments. However, its impact is broad, and there was little further understanding gained in this area.

Research Question 2

Q2 Is there a relationship between a learner's locus of control and self-regulated learning in an online course?

The current study failed to find a relationship between locus of control and self-regulated learning. Self-regulated learning consisted of goal setting, environment structuring, task strategies, time management, help seeking, and self evaluation. As mentioned previously, Lopez and Harper (1989) suggested that students with an internal locus of control do not always translate that belief into action. Although they did not differentiate by locus of control, Hicken, Sullivan, and Klein (1992) demonstrated that learners given control tend not to use it. In their study, students given extra examples and the choice to opt out did not; while those that were given few with the option to see extra chose not to.

Wang and Newlin (2000) had found some support for a relationship between locus of control and self-regulated learning in an online environment. They found that an internal locus of control along with a high degree of inquisitiveness and a high level online course activity were significant predictors of successful performance in online learning environments.

It would make sense that all students, no matter what their tendencies are in terms of locus of control, would see these factors as important in their success in online learning. Students who take online courses using learning management systems are constantly reminded that they need to carefully manage their time and activities, and then

are given several options for seeking help. The system is designed to aid in self-regulated learning, regardless of how students view locus of control. It is nearly impossible for students to ignore the learning regulation features built into a learning management system. They receive notifications of announcements, assignments, due dates, chat sessions, virtual office hours, and many other factors related to self-regulated learning. The features of the learning management system used in this study imposed certain aspects of self-regulation that may have minimized the impact of locus of control. The results might have been greatly different if there was less support and students were required to impose their own self-regulation strategies in order to be successful in the course. Although Williams and Hellman (2004) posited that powerful others such as parents or teachers take a role as social forces fostering students' self-regulation, autonomous learning activities could neutralize the direct effect from social modeling through self-directed practices. Zimmerman (1998) asserted that the self-regulation should deliver the learning tasks with proper practices by autonomous strategic behavior.

Research Question 3

Q3 Is there a relationship between a learner's motivation and self-regulated learning in an online course?

The significant findings in this study were found in the relationships between motivation and self-regulated learning. Motivation was examined in four areas: attention, relevance, confidence, and satisfaction (Keller, 2010). Self-regulated learning was divided into six areas: goal setting, environmental structuring, task strategies, time management, help seeking, and self-evaluation (Barnard, Lan, To, Paton, & Lai, 2009). Of the 24 possible subscale comparisons, 13 were significant (the Pearson Correlations ranged from a low of .36 to a high of .54).

Two self-regulated learning subscales, time management and task strategies, had significantly positive correlations with all four of the motivation areas. Time management indicates that successful learning occurs when students: allocate study time and extra study time to online classes, keep a daily or weekly schedule for completing tasks in the online course, and distribute time devoted to the online class equally each day. This study found that there was a positive relationship between all of these time management factors and attention, relevance, confidence, and satisfaction toward the instructional materials. Clearly, students who were motivated by the instructional materials wanted to succeed in the class. One important factor of this success is adhering to good time management practices.

The literature demonstrates that success in online learning is closely identified with time management. For example, Macfadyen and Dawson (2010) describe how one institution identifies at-risk students in online classes by their level of online activity in order to intervene in a timely manner. Many guides for readiness of online education also emphasize good time management (e.g., University of Minnesota, LearnNowBC) as a factor related to student success. When taking online classes, students must pay attention to reading schedules, discussion board posting deadlines, due dates for submitting assignments and projects, online office hours, small group online meeting times, and time for completing exams and quizzes. Although these tasks also occur with face-to-face classes, students generally have more practice in that environment. Good information design, by its nature, should help students manage the time that they devote to the online class.

Task strategies were also found to be positively related to motivational attention, relevance, confidence, and satisfaction. Task strategies indicate that successful learning occurs when students: used note taking to enhance learning, read aloud to themselves, prepared questions for chat or discussion in advance, and worked extra problems in addition to the assigned work. Zimmerman (1998) stated:

> The process of self-regulating *task strategies* refers to analyzing the task and identifying specific, advantageous methods for learning. There is considerable variation in the types of task strategies that were used across the four areas of expertise, ranging from outlines to mnemonics, to structure one's thinking and performance. (p. 76)

Barnard et al. (2009) insisted that self-regulation becomes an important factor in the online learning environment.

Goal setting had a significantly positive relationship with three of the four motivation areas: relevance, confidence, and satisfaction. Goal setting is a conscious effort on the part of the student to accomplish various things related to the online course such as completing all of the assignments and discussion boards, setting high standards for their online work, setting goals to manage their time effectively, and not compromising the quality of their work just because it is online. By engaging in these types of behaviors and activities related to goal setting, students can expect to be successful in the course. Therefore, it stands to reason that these items correlate positively with their motivation.

Environmental structuring was significantly correlated with only the confidence area. Help seeking did not correlate with any motivation area. Further research could explore why these factors appear less important.

This study provides strong support for a relationship between motivation and self-regulated learning (particularly in the areas of time management and task strategies) in the perceptions of students using online learning environments.

Limitations of the Study

This study relied on survey data from students enrolled in an online educational technology course. They were all preservice teachers, mostly sophomores, but no additional demographic information was collected. These results may not generalize to other populations. Like all self-reports, the quality of this information was dependent on the honesty and reflection of the participants. Although there was no specific reason to question the validity of the responses, they bore the limitation of being a self-reported data source.

The response rate for the survey was 34%. Although it was optional, the study was part of an educational technology course, and a higher response rate was expected. The length of the survey may have discouraged participation. It was not clear if there was a bias in terms of who completed the survey, but this was a possible limitation.

This study used three established instruments in an attempt to measure locus of control, motivation, and self-regulated learning. The instruments selected are not necessarily the only ones available to measure these constructs. In addition, presenting them together to the participants may have unintentionally biased some of the responses. Finally, each of these constructs affects learners throughout a learning experience and can be explored in much more depth. Although instrumentation choices must be made, the choices made here do represent limitations to the study.

Recommendations for Future Research

One theme that emerged from the motivation data was that some of the instructional materials were quite difficult, and students had trouble understanding the content. This likely had an impact on their level of confidence. Future research might investigate how pretesting to determine students' existing knowledge could be used to help design instruction that is more appropriate in terms of the level of difficulty. Follow-up post-testing, once the materials are redesigned, could determine whether the instructional materials are more effective at meeting the students' needs in terms of the content. Keller's motivation instrument could also be used as a follow up instrument to see whether confidence had been boosted.

The motivation instrument also revealed that students did not particularly enjoy the content of the course. This item was ranked among the lowest on the instrument: "I enjoyed this lesson so much that I would like to know more about this topic." This may be due to administering the survey near the end of the course (when motivation is lower and students are feeling more stressed). Future research can take this into account and look for data throughout the course of the semester. Additionally, responses on the motivation instrument illuminated the fact that the materials were not particularly eye-catching (which is a general complaint regarding current LMS use). In the future, course designers might want to conduct research regarding aesthetics in order to determine how to make the materials more pleasing to the learners. Feedback was also rated as being inadequate in terms of motivation and satisfaction with the course. As a result, researchers could investigate how to design and develop online instruction that is

eye-catching, enjoyable, and appropriate in terms of feedback. No attempt was made in the current study to follow up on specific concerns raised about the course materials.

Because significant correlations were found between time management and motivation, the next logical step for researchers would be to determine whether or not there is a cause and effect relationship between these factors. When students practice good time management behaviors, does this lead them to perceive that the course materials are motivational? Or, is it the other way around? Do motivating instructional materials cause students to practice good time management behaviors? Perhaps there is no direct cause/effect relationship between the two factors of time management and motivation, but another underlying cause exists. The same pattern would apply to task strategies. Is there a cause and effect relationship between task strategies and motivation as measured by Keller's instrument? Future research could focus in more detail on this topic.

The courses used for this study were dependent on a learning management system that is heavily text oriented and generally discourages creative information design and presentation. A visually-based version of an educational technology course that utilizes graphic elements effectively may yield different results.

Conclusion

In this study learner locus of control was found not to correlate with motivation in the online preservice educational technology course. Furthermore, learner locus of control was found not to correlate with self-regulated learning in the course. However, the majority of the subsections of self-regulated learning were found to significantly correlate with learner motivation. Threats to validity of the data might include the fact

that it was self-reported by the subjects and had a relatively low response rate. Readers were cautioned to consider these limitations.

The discussion of the findings focused on two major factors, time management and task strategies, that were moderately correlated with motivation. The researcher concluded that this was likely a function of the fact that students see these two factors as being related to their success in the class and, as a result, are motivated to practice them.

This researcher recommends that future studies focus on analyzing which topics students feel are relevant and on looking at ways to enhance the aesthetic design in order to increase learner motivation. Additionally researchers involved in designing preservice educational technology courses should consider further learner analysis in order to avoid making the materials too difficult. All of these topics are directly related to instructional design.

There are many factors that lead to a learner's success. As this research has shown, some factors are more prominent than others. By identifying and clarifying the relationships among factors in online learning, educators can design better learning environments and better assist learners.

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APPENDIX A

ONLINE SELF-REGULATED LEARNING QUESTIONNAIRE (OSLQ)

Direction: Read each statement on the left column. Then, indicate whether you agree or disagree with it using the following scale.

Scoring: 1 = Strongly Agree (SA)

2 = Agree (A)

3 = Neither agree nor disagree (N)

4 = Disagree (D)

5 = Strongly Disagree (SD)

	SA A N D SD
1. I set standards for my assignments in online courses.	1……2……3……4……5
2. I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).	1……2……3……4……5
3. I keep a high standard for my learning in my online courses.	1……2……3……4……5
4. I set goals to help me manage studying time for my online courses.	1……2……3……4……5
5. I don't compromise the quality of my work because it is online.	1……2……3……4……5
6. I choose the location where I study to avoid too much distraction.	1……2……3……4……5
7. I find a comfortable place to study.	1……2……3……4……5
8. I know where I can study most efficiently for online courses.	1……2……3……4……5
9. I choose a time with few distractions for studying for my online courses.	1……2……3……4……5
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.	1……2……3……4……5
11. I read aloud instructional materials posted online to fight against distractions.	1……2……3……4……5
	>> go to next page

Continuing…

	SA A N D SD
12. I prepare my questions before joining in the chat room and discussion.	1……2……3……4……5
13. I work extra problems in my online courses in addition to the assigned ones to master the course content.	1……2……3……4……5
14. I allocate extra studying time for my online courses because I know it is time-demanding.	1……2……3……4……5
15. I try to schedule the same time everyday or every week to study for my online courses, and I observe the schedule.	1……2……3……4……5
16. Although we don't have to attend daily classes, I still try to distribute my studying time evenly across days.	1……2……3……4……5
17. I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.	1……2……3……4……5
18. I share my problems with my classmates online so we know what we are struggling with and how to solve our problems.	1……2……3……4……5
19. If needed, I try to meet my classmates face-to-face.	1……2……3……4……5
20. I am persistent in getting help from the instructor through e-mail.	1……2……3……4……5
21. I summarize my learning in online courses to examine my understanding of what I have learned.	1……2……3……4……5
22. I ask myself a lot of questions about the course material when studying for an online course.	1……2……3……4……5
	>> go to next page

Continuing…

	SA A N D SD
23. I communicate with my classmates to find out how I am doing in my online classes.	1……2……3……4……5
24. I communicate with my classmates to find out what I am learning that is different from what they are learning.	1……2……3……4……5

APPENDIX B

BROWN'S LOCUS OF CONTROL SCALE (BLOCS)

Direction: Read each statement on the left. Then, indicate whether you agree or disagree with it using the following scale.

Scoring: 1 = Strongly Agree (SA)

2 = Agree (A)

3 = Neither agree nor disagree (N)

4 = Disagree (D)

5 = Strongly Disagree (SD)

	SA A N D SD
1. My friendships depend on how well I relate to others.	1……2……3……4……5
2. Accidental happenings have a lot to do with my life.	1……2……3……4……5
3. Rules and practices that have been around for many years should determine what will happen to my life.	1……2……3……4……5
4. I am fairly able to determine what will happen to my life.	1……2……3……4……5
5. Religious faith will get me through hard times.	1……2……3……4……5
6. The government will run whether I get involved or not.	1……2……3……4……5
7. Getting ahead is a matter of pleasing people in power.	1……2……3……4……5
8. Generally it's not what I know, but who I know.	1……2……3……4……5
9. I make mistakes—accidents just don't happen.	1……2……3……4……5
10. Being in the right place at the right time is important for my success.	1……2……3……4……5
11. My friends often determine my actions.	1……2……3……4……5
	>> go to next page

Continuing…

	SA A N D SD
12. The ideas about life that have been around since time began have an influence on my life.	1……2……3……4……5
13. Most of the time, I control what happens in my life.	1……2……3……4……5
14. Strong pressure groups determine my role in society.	1……2……3……4……5
15. My plans will not work unless they fit into the plans of those in power.	1……2……3……4……5
16. My close relationships with people don't just happen—they need to be worked on.	1……2……3……4……5
17. Some powerful force or person predetermined most of what happens in my life.	1……2……3……4……5
18. My life is often affected by fate.	1……2……3……4……5
19. My actions determine my life.	1……2……3……4……5
20. Hard work will get me where I want to go.	1……2……3……4……5
21. I can generally take care of my personal interests.	1……2……3……4……5
22. I have to work with others to get a job done.	1……2……3……4……5
23. My ability without pleasing people in power makes little difference.	1……2……3……4……5
24. My life is often affected by luck.	1……2……3……4……5
25. I can usually carry out plans that I make for myself.	1……2……3……4……5
	>> go to next page

APPENDIX C

INSTRUCTIONAL MATERIALS MOTIVATION SURVEY (IMMS)

Instruction:

1. There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional materials you have just studied, and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

2. Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

3. Record your responses on the answer sheet that is provided, and follow any additional instructions that may be provided in regard to the answer sheet that is being used with this survey. Thank you.

Scoring: 1 = Not true
2 = Slightly true
3 = Moderately true
4 = Mostly true
5 = Very true

	Not true Very true
1. When I first looked at this lesson, I had the impression that it would be easy for me.	1…… 2…… 3…… 4…… 5
2. There was something interesting at the beginning of this lesson that got my attention.	1…… 2…… 3…… 4…… 5
3. This material was more difficult to understand than I would like for it to be.	1…… 2…… 3…… 4…… 5
4. After reading the introductory information, I felt confident that I knew what I was supposed to learn from this lesson.	1…… 2…… 3…… 4…… 5
5. Completing the exercises in this lesson gave me a satisfying feeling of accomplishment.	1…… 2…… 3…… 4…… 5
6. It is clear to me how the content of this material is related to things I already know.	1…… 2…… 3…… 4…… 5
	>> go to the next page

Continuing…

	Not true Very true
7. Many of the pages had so much information that it was hard to pick out and remember the important points.	1…… 2…… 3…… 4…… 5
8. These materials are eye-catching.	1…… 2…… 3…… 4…… 5
9. There were stories, pictures, or examples that showed me how this material could be important to some people.	1…… 2…… 3…… 4…… 5
10. Completing this lesson successfully was important to me.	1…… 2…… 3…… 4…… 5
11. The quality of the writing helped to hold my attention.	1…… 2…… 3…… 4…… 5
12. This lesson is so abstract that it was hard to keep my attention on it.	1…… 2…… 3…… 4…… 5
13. As I worked on this lesson, I was confident that I could learn the content.	1…… 2…… 3…… 4…… 5
14. I enjoyed this lesson so much that I would like to know more about this topic.	1…… 2…… 3…… 4…… 5
15. The pages of this lesson look dry and unappealing.	1…… 2…… 3…… 4…… 5
16. The content of this material is relevant to my interests.	1…… 2…… 3…… 4…… 5
17. The way the information is arranged on the pages helped keep my attention.	1…… 2…… 3…… 4…… 5
18. There are explanations or examples of how people use the knowledge in this lesson.	1…… 2…… 3…… 4…… 5
19. The exercises in this lesson were too difficult.	1…… 2…… 3…… 4…… 5
20. This lesson has things that stimulated my curiosity.	1…… 2…… 3…… 4…… 5
	>> go to the next page

Continuing…

	Not true Very true
21. I really enjoyed studying this lesson.	1…… 2…… 3…… 4…… 5
22. The amount of repetition in this lesson caused me to get bored sometimes.	1…… 2…… 3…… 4…… 5
23. The content and style of writing in this lesson convey the impression that its content is worth knowing.	1…… 2…… 3…… 4…… 5
24. I learned some things that were surprising or unexpected.	1…… 2…… 3…… 4…… 5
25. After working on this lesson for awhile, I was confident that I would be able to pass a test on it.	1…… 2…… 3…… 4…… 5
26. This lesson was not relevant to my needs because I already knew most of it.	1…… 2…… 3…… 4…… 5
27. The wording of feedback after the exercises, or of other comments in this lesson, helped me feel rewarded for my effort.	1…… 2…… 3…… 4…… 5
28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the lesson.	1…… 2…… 3…… 4…… 5
29. The style of writing is boring.	1…… 2…… 3…… 4…… 5
30. I could relate the content of this lesson to things I have seen, done, or thought about in my own life.	1…… 2…… 3…… 4…… 5
31. There are so many words on each page that it is irritating.	1…… 2…… 3…… 4…… 5
32. It felt good to successfully complete this lesson.	1…… 2…… 3…… 4…… 5
33. The content of this lesson will be useful to me.	1…… 2…… 3…… 4…… 5
34. I could not really understand quite a bit of the material in this lesson.	1…… 2…… 3…… 4…… 5
35. The good organization of the content helped me be confident that I would learn this material.	1…… 2…… 3…… 4…… 5
36. It was a pleasure to work on such a well-designed lesson.	1…… 2…… 3…… 4…… 5

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL DOCUMENTS

UNIVERSITY of NORTHERN COLORADO
Institutional Review Board (IRB)

November 22, 2010

TO: Maria Lahman
Applied Statistics and Research Methods

FROM: The Office of Sponsored Programs

RE: Exempt Review of *Investigation of Online Preferences and Materials,* submitted by Sung-Ho Min (Research Advisor: Jeffrey Bauer and James Gall)

The above proposal is being submitted to you for exemption review. When approved, return the proposal to Sherry May in the Office of Sponsored Programs.

I recommend approval.

M-H. S. M 12-6-10

Signature of Co-Chair Date

The above referenced prospectus has been reviewed for compliance with HHS guidelines for ethical principles in human subjects research. The decision of the Institutional Review Board is that the project is exempt from further review.

IT IS THE ADVISOR'S RESPONSIBILITY TO NOTIFY THE STUDENT OF THIS STATUS.

Comments:

25 Kepner Hall ~ Campus Box #143
Greeley, Colorado 80639
Ph: 970.351.1907 ~ Fax: 970.351.1934