

SELF-REGULATED LEARNING CHARACTERISTICS OF SUCCESSFUL VERSUS
UNSUCCESSFUL ONLINE LEARNERS IN THAILAND

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The purpose of this study was to identify the existing level of self-regulated learning (SRL) among Thai online learners, to examine the relationship between SRL and academic achievement based on a) course completion and b) course grades, and to investigate differences in SRL as they correlate to demographic factors. A mixed-methods research design with modified MSLQ online surveys and semi-structured interviews was used during the process of data collection. One hundred eighty-eight of the 580 online learners enrolled in the certificate programs of the Thailand Cyber University Project responded to the surveys; 7 of these also participated in the interview process.

The findings indicated that Thai online learners reported high levels of SRL characteristics. Independent sample *t*-test results revealed that successful learners were higher in SRL learning strategies than those who did not succeed the course. Results from multiple regression analyses indicated that critical thinking and time/study environmental management were significant predictors of academic course grade with a small effect size ($R^2 = .113$). Comparison of mean differences revealed that some SRL characteristics were different among demographic subgroups determined by factors including gender, age range, marital status, and Internet use; female reported a significantly higher level of task value than male; younger learners had a significantly higher level of test anxiety than older learners; married learners reported a significantly higher level of self-efficacy and task value than single learners; online learners who had

more Internet experience reported a significantly higher level of self-efficacy, metacognitive self-regulation, and time/study environmental management than those who had less Internet experience. In addition, the qualitative findings confirmed that participants reported the use of learning strategies in four categories, with a high number of references to metacognitive self-regulation and elaboration, and a low number of references to critical thinking and time/study environmental management. Furthermore, the qualitative results revealed that Thai online learners used different tools for social and personal activities, communication, and information searching.

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CHAPTER 1

INTRODUCTION

Background of the Study

The evolution of educational innovations in the age of information communication and technology (ICT) has progressed throughout modern times. Several forms of educational technologies have been invented to assist and facilitate the process of teaching and learning at all educational levels. At the university level, the development of online learning has become more and more important during recent decades. Today, online learning is frequently used all over the world in the form of Web and Internet-based learning, and it may prove effective in facilitating advanced study coursework for both urban learners and rural students. For instance, the majority of universities in the US are adding asynchronous Web-based instruction to their undergraduate degree programs (Lynch & Dembo, 2004). Collins, Schuster, Ludlow, and Duff (2002) found that online learning can provide effective strategies for offering courses and field experiences in special education teacher preparation programs. Organizations also apply online learning in order to employ Web-based training in their employee training programs (Gravill & Compeau, 2008). In both developing and developed countries, online learning has been used as a major form of distance education (Palmer & Holt, 2010).

In Thailand, E-learning is still in the early stages of development. According to the National Education Act (NEA) of 1999, learning reform is a top priority for all concerned. E-learning, as a part of Thai educational reform, allows Thai students to become self-learners, which is a step in the direction of “student-centered” learning.

Hopefully, E-learning will enhance opportunities for lifelong learning and allow Thai students to study anywhere, at anytime, and at their own pace. Also in the year 2004, a master plan for information communication and technology use in education was developed. As a result, the Thailand Cyber University Project (TCU) has been established to assist all of the higher education institutes in developing and delivering distance learning in online learning environments.

While E-learning has grown, many concerns about the quality of online education and of self-learners have surfaced. One of TCU's missions is to ensure that all online courses are of a high quality and meet government standards. Online content access is another concern with regard to E-learning in Thailand (Morse & Suktrisul, 2006). At the same time, advances in learning strategies such as self-regulated learning (SRL) have been used in many countries as a specific type of learning strategy to improve students' achievement (Boekaerts & Cascallar, 2006). According to Pintrich (2000), self-regulated learning has been defined as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (p. 453). Puzziferro (2008) also pointed out that students who are self-regulating are much more likely to be successful in school, to learn more, and to achieve at higher levels. Some studies, however, showed that students have difficulty with self-regulated learning when using online learning environments (Lee, Shen, & Tsai, 2008; Tsai, 2010).

Online learning environments are a subcategory of distance education and are platforms on which educational courses are delivered through the Internet or using web-

based instructional systems either in real-time (synchronously) or asynchronously. Reid (2005) stated that a web-based instructional system or online learning system is easy and inexpensive compared to traditional learning methods. According to Moore and Kearsley (2005), Web-based instruction can make extensive use of network technologies to incorporate a variety of organizational, administrative, instructional, and technological components, thus offering flexibility concerning the new methodology of learning. Gravill and Copeau (2008) pointed out that online learning is self-managed, as an instructor provides the software programs and resources to transfer new skills while the learners control the process to achieve their own objectives to acquire those new skills. Thus, the process of online learning will be implemented by the learners, and the learners will become active controllers instead of passive learners, which had been the norm for studying in past decades.

It is important for students to learn new skills and improve their self-learning strategies as technology rapidly changes or is introduced into their learning environments (Perry, Phillips, & Hutchinson, 2006). Learners are increasingly expected to assess and manage their own learning needs. Wageman (2001) mentioned self-management, which is a sub-area of self-regulated learning, saying that it is a disciplinary skill that offers benefits; as such it is important for students to learn this particular skill. Cheng (2011) also stated that students needed to employ self-assessing, self-directing, controlling, and adjusting, in order to acquire knowledge. Self-regulated learning is the effective strategies to improve appropriate skills for students in the age of information and communication technology (ICT).

Self-regulated learning has become a central topic in facilitating learning in online learning environments during the past decade. Self-regulated learning strategies have been identified and used in the field of educational psychology. Boekaerts and Corno (2005), Dweck (2002), and Perry and colleagues (2006) have defined self-regulated learning as a learning behavior that is guided by “metacognition” (thinking about one's own thought process including planning, monitoring, and regulating activities); “strategic action” (organizing, time management, and evaluating personal progress against a standard); and “motivation to learn” (self-confidence, goal setting, and task value). Learners choose their own effective approach to learn the educational material and gain the study skills they need. To manage these self-regulated learning strategies effectively, learners have to have an effective strategy that they will invoke to meet their learning goals. Self-regulated learning strategies have the potential of becoming study skills and regularly used behaviors. Individuals who are self-regulated learners believe that taking on challenging tasks, practicing what they have learned, developing a deep understanding of subject matter, and exerting effort will bring them success in academic areas (Perry et al., 2006).

In the Thai educational system of the past, students in formal education got used to a spoon-feeding teaching method that had been used since they were children (Suanpang & Petocz, 2006). Even today, they are accustomed to following their parents' regulations, the rules of school management, and teachers' arrangements for their learning. Unlike learning in the traditional classroom, online learning is generally a solitary process, carried out without the teacher's assistance (Tsai, 2010). Students need communication with a teacher and peers in order to fully engage with the

presented information, get feedback, and identify their own knowledge gaps as well as their misconceptions (Tsai, 2010). Cheng (2011) mentioned that the education of Hong Kong students needed to be more fully developed in order to be effective, which is one of the most important aims of education reform in Hong Kong. However, many research findings in Asian countries have shown gaps between aspiration and attainment, especially in online learning environments; students often lacked effective self-regulatory skills, and some of them experienced unsuccessful results in online learning environments (Cheng, 2011; Suanpang & Petocz, 2006; Tsai, 2010).

Specific issues have been found in Thai online education in the last few years, including that the majority of online learners who enrolled in certificate programs (free-of-charge programs) offered by Thailand Cyber University were unsuccessful in online courses; some dropped out during the course process; some had incomplete activities and grades; and some left the courses after the first steps in the course had been taken without any reason. TCU's self-report on the 2011 certificate program shows the statistics of 7 certificate programs. There were 499 applicants, but only 247 learners (49.5 %) participated in online courses, and only 153 online learners (30.6 %) were successful in online certificate programs. The definitive causes for these low statistics and methods for resolution of the problems whose existence they suggest have not been established as of yet. However, administrators and instructors identified the very nature of the "free programs" as a potential cause. Students are free to attend or cut classes at any time, so they do not value or place importance on completion of the course.

Self-regulated learning has been acknowledged as an important topic in Thai educational research and development for over a decade. Educators, instructors, and researchers have applied the social cognitive theories of self-regulated learning (Bandura, 1986) in Thailand in different ways, as shown in Teeraputon's (2003) dissertation: Arnmanee (1996) made a comparison between 9th grade students using SRL in reading techniques and those given traditional instruction; Watchai (1997) studied the effect of SRL on English reading; Techakomol (1998) studied the factors that influence SRL in middle school students in Bangkok; Jaradol (1999) used social cognitive theories in the training process for primary school teachers; Panmongkol (1999) studied the effect of the SRL program on academic achievements of 12th grade students; and Teeraputon (2003) applied SRL strategies in a computer network used for undergraduate students, etc.

However, there is little empirical research on SRL in online learning environments in Thailand. Therefore, this study seeks to fill that research gap. The purpose of this study is to discover and describe the existing SRL level of Thai online learners, to investigate the relationship between SRL and academic achievement based on completion and class grades, and to examine other demographic factor differences in SRL among Thai online learners. An exploration of online learners' SRL will guide future educators and instructors in designing appropriate activities for online courses and provide guidelines for online learners to improve their self-regulatory skills for online learning environments in Thailand.

Statement of the Problem

The majority of recent research on self-regulated learning, especially in Thailand, focuses on either the relationship between SRL and academic performance or the implementation of self-regulated learning strategies into instructional processes. Implementation is done by creating and applying new instructionally designed models or prototypes in traditional classrooms. However, neither of these approaches has described the existing SRL of online learners, nor have they examined demographic factor differences. This study has been conducted with the idea that an exploration of online learners' SRL would provide guidelines for educators and instructors in designing appropriate activities for online courses and provide guidelines for online learners in improving their self-regulated learning strategies for online learning environments in Thailand. Also, the present study aims to find out if there are reasons, which can explain the dropout rate problems of the certificate programs offered by the Thailand Cyber University Project.

Purpose of Study

The purpose of this study is to identify and describe the existing SRL level of Thai online learners, to investigate the relationship between SRL and academic achievement based on course completion and course grades, and to examine the demographic factor differences in SRL among Thai online learners. The current study focused on the challenges faced by Thai learners enrolled in online learning environments in the certificate programs offered by the TCU.

Research Questions and Hypotheses

The three questions in support of this study's purpose are:

1) What is the existing level of Thai online learners' SRL in online learning environments?

2) What is the relationship between SRL characteristics and academic achievement in Thai online learning environments?

3) Are there any differences in SRL characteristics among online learners in different demographic subgroups?

Hypothesis 1: Successful online learners will have levels of SRL different from those of unsuccessful online learners. This will also be true for major disaggregated groups based on a) gender, b) educational level, c) age range, d) marital status, e) Internet use experiences, and f) online course experiences.

Hypothesis 2: Among successful online learners, those who have higher levels of SRL will have higher course grades.

Hypothesis 3: Among online learners, the levels of SRL characteristics will be different among different demographic groups.

Significance

It is hoped that given information about online learners' SRL characteristics and the association between SRL and academic achievement for Thai online learning environments, educators will adapt their teaching styles to match online learners' SRL characteristics and take these SRL characteristics into consideration in order to develop their instructional design and course activities effectively; researchers will use the results of this study as part of their secondary data and will use the results in finding

further issues that need to be researched; and finally learners will benefit by applying the findings from this research to their learning strategies in order to improve and succeed in their academic endeavors in online learning environments.

The results of this study will be of use in future studies in the field of self-regulated learning and online education by providing insights regarding the existing level of online learners' SRL and the relationship between SRL and academic achievement in Thai online learning environments. Also, the results of this study can be used as of guidelines or basic instructions for novice learners in online courses or hybrid courses in Thailand and will hopefully improve their learning skills so that they can become successful learners in online learning environments in Thailand.

Methods

A mixed-methods research design with correlational study addresses seven SRL characteristics (task value, self-efficacy, test anxiety, elaboration, critical thinking, metacognitive self-regulation, and time/study environmental management) based on the study model of Pintrich, Smith, Garcia, and McKeachie (1993) and Artino and McCoach (2008), and investigates their relationship with academic achievement based on a) completion and b) course grades (for those who complete the courses). The semi-structured interviews were used in the qualitative portion of this study in order to elaborate on individual uses of SRL strategies in online learning environments. The goal of the quantitative portion of the study is to establish whether differences exist in SRL levels and, if they exist, where the differences can be found. Meanwhile, the goal of the qualitative portion of the study is to investigate the information gained from interviewees' responses about self-regulated learning strategies used in online learning courses and

to categorize them into 4 categories based on the SRL theories applied to in the current study.

The data for both the quantitative method and the qualitative method in the present study are based on learners' experiences taking online learning course in certificate programs offered by Thailand Cyber University Project (TCU) on the website www.thaicyberu.go.th. For the quantitative method, participants were asked to respond to a self-report questionnaire, the Modified Motivated Strategies for Learning Questionnaire (Modified MSLQ) during the middle of the course term. Academic achievement was measured by: a) collecting the number of completers versus non-completers in online learning courses and b) collecting data on learners' course grades at the end of the course period. The qualitative method was performed at the end of the course period, but only seven participants from completers' group came to the interview site and volunteered to participate in the interview process. The main purpose of the qualitative analysis component is to describe the individual experiences of the online learners in order to provide additional context for the findings of this study.

The instrument used in the quantitative process is a modification and translation into a English-Thai version of the MSLQ, which was originally compiled by Pintrich et al. (1993) and modified for online learning environments by Artino and McCoach (2008). The Modified MSLQ consists of 50 items from two specific domains: motivational beliefs and learning strategy use, and it is a self-report Likert-type questionnaire. Participants were asked to give responses to the items on a 7-point rating scale with *not at all true of me* and *very true of me* at the extremes. Another instrument used in the qualitative process is the semi-structured interviews, which were derived from the results of the

quantitative study. The semi-structure interview was used to elicit more information about learners' self-regulated learning strategies in online learning courses.

The concept of SRL is based on the studies of Pintrich et al. (1993), Artino and McCoach (2008), and Zimmerman and Martinez-Pons (1986), and is composed of two domains, a motivational beliefs domain and a self-regulated learning strategies domain. The motivational beliefs domain consists of 3 subscales: task value, self-efficacy, and test anxiety. The self-regulated learning strategies domain consists of 4 subscales: elaboration, critical thinking, metacognitive self-regulation, and time/study environmental management (Artino & McCoach, 2008). The four characteristics of the self-regulated learning strategies domain were also used in the qualitative research process to categorize the interviewees' self-regulated learning strategies.

Delimitations

The current study is delimited by the nature of the data collected from the online learners who enrolled in certificate programs free of charge at Thailand Cyber University Project. The courses in those programs were not randomly chosen and may be different from other online learning courses in other universities. Thus, the results of this study may not be generalizable to online learners in other Thai universities. Additionally, the notion of self-regulated learning used in this study is delimited to the seven categories referred to in the study of Artino and McCoach (2008).

Limitation of the Study

As with other mixed-method researches, there were limitations associated with the data collection process. In the quantitative method of the present study, data collection was processed during the middle of the course term period. Therefore, the

sample sizes in the comparison process are not expected to be equal between the completer and non-completer groups. Also, the instrument used in this part was the self-report measure, which relied on participants' ability and willingness to report accurately. In addition, the interview for the qualitative analysis was conducted on the last day of the term period. Hence, all participants who came on that day were exclusively online course completers.

Definition of Terms

Self-regulated learning characteristic is a learning behavior that is guided by 1) motivational beliefs, which include task value, self-efficacy, and test anxiety; 2) self-regulated learning strategies, which consist of cognitive strategy use (critical thinking) and self-regulation (elaboration, metacognitive self-regulation, and time/study environmental management).

Task value is defined as the inherent enjoyment or pleasure one gets from engaging in an activity, or simply a person's subjective interest in the content and usefulness of a task.

Self-efficacy is defined as an individual's confidence in his or her ability to successfully learn the material presented in a self-paced, online learning format.

Test anxiety is a combination of physiological over-arousal, worry, and dread about test performance, and it often interferes with normal learning and lowers test performance.

Elaboration is defined as an individual's use of elaboration strategies such as paraphrasing, summarizing, relating ideas, and pulling together information from all of the different available online sources.

Critical thinking is defined as an individual's use of critical thinking strategies such as applying previous knowledge to new situations or making critical evaluations of ideas contained in all online materials.

Metacognitive self-regulation is defined as an individual's use of metacognitive strategies such as planning, monitoring, and regulating to complete on task in online learning environments.

Time and study environmental management is defined as an individual's self-initiated efforts to select, manage, or arrange time, schedule, and the physical setting in order to make online learning easier.

Online learning environments are platforms on which educational courses are delivered via the Internet, or through the use of Web-based instructional systems either in real-time (synchronously) or asynchronously. In this study, online learning environments include the online courses that are conducted in the Thailand Cyber University Project.

Academic achievement is the outcome of education and the extent to which an individual has achieved his/her educational goal. Academic achievement in this study will be measured by: a) the number of completers versus non-completers in the online learning courses and b) learners' course grades throughout the long-term online learning courses.

Demographic information is the characteristics of a human population such as the one used in this research study, which include a) gender, b) educational level, c) age range, d) marital status, e) Internet use experiences, and f) online course experiences.

Summary

The purpose of this study was to find out and describe the existing level of self-regulated learning (SRL) of Thai online learners, to examine the relationship between self-regulated learning and academic achievement based on completion and course grades, and to investigate differences demographic factors in self-regulated learning characteristics among Thai online learners. This study focused on the challenges faced by Thai learners enrolled in online learning environments in the certificate programs of Thailand Cyber University Project (TCU). Three questions for the study were: 1) What is the existing level of online learners' SRL in Thai online learning environments? 2) What is the relationship between SRL characteristics and academic achievement in Thai online learning environments? 3) Are there any differences in SRL characteristics among online learners in different demographic subgroups?

The results of this study will prove to be of use in future studies of self-regulated learning and E-learning by providing insights regarding the existing level of online learners' SRL and the relationship between SRL and academic achievement in Thai online learning environments. Instructors and educators can adapt these SRL characteristics to match their teaching styles and apply to their online courses in order to develop their instructional design and course activities effectively. Also, the results of the present study can be used in the formulation of guidelines or basic instruction for novice learners in online courses or hybrid courses in order to help them to prepare and to improve their learning skills and hence to become successful learners in online learning environments in Thailand.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of relevant literature and previous research. The theoretical framework of self-regulated learning is the main focus of this review. This section discusses a social cognitive theoretical perspective, a conceptual model of self-regulated learning, the relationship between self-regulated learning and academic achievement, and the relationship between self-regulated learning and demographic factors such as gender, age range, level of education, etc. The next major section addresses general information regarding online learning and the evolution of E-learning in Thailand, and presents a brief introduction to the Thailand Cyber University Project. Finally, detailed information on three self-regulated learning measurements, the MSLQ (Pintrich et al., 1993), the MMSLQ (Artino & McCoach, 2008), and the SRLIS (Zimmerman & Martinez-Pons, 1986) is provided.

Theoretical Framework

Social Cognitive Theory of Self-Regulated Learning

According to Bandura (1986), social cognitive theory is a subtype of cognitive theory, which emphasizes that an individual's actions and reactions in almost every situation are influenced by the actions which that individual has observed in others. It is a learning theory based on the ideas that people learn by watching what others do and do not do. Bandura's social cognitive theory defines human functioning as reciprocal interactions among behavioral, environmental, and personal determinants.

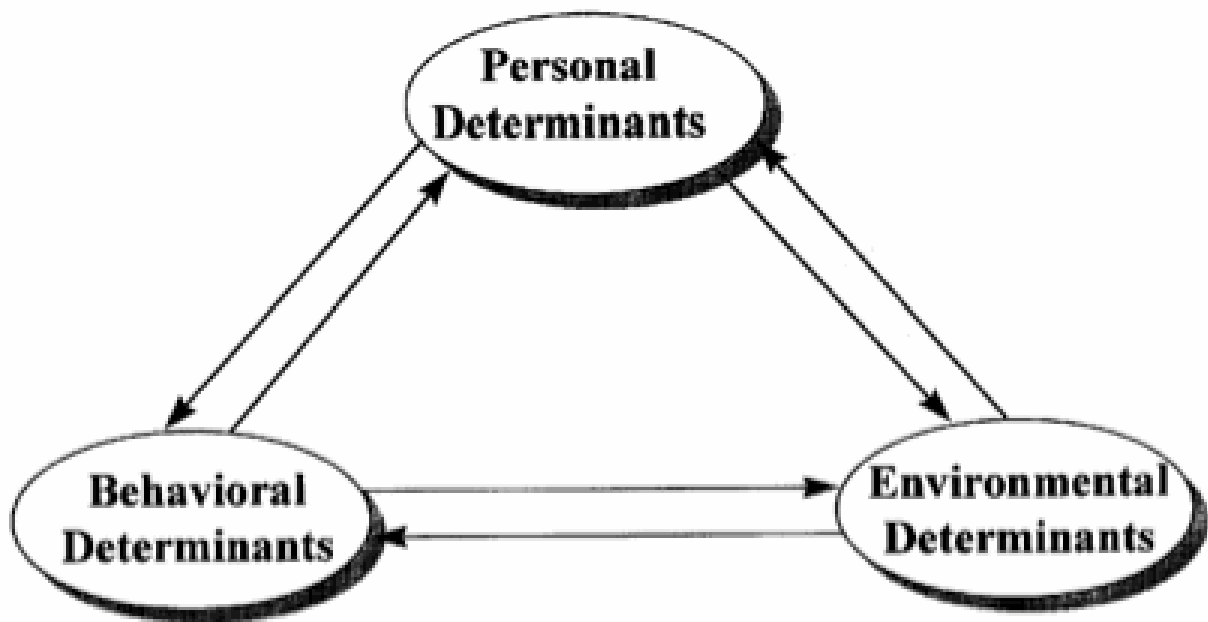


Figure 1. Schematization of Bandura's triadic reciprocal causation in the causal model of social cognitive theory (Bandura, 2002).

As illustrated in Figure 1, the theory identifies human behavior as an interaction among personal factors (in the form of cognitive, affective, and biological events), behavior, and the external environment (Bandura, 1986). Recent research supports the conclusion that the social cognitive model describes how social factors within the learning environment influence a learner's ability to self-regulate (Artino, 2007; Pintrich, 2000; Zimmerman, 2002). Social cognitive theorists define self-regulated learning as learning that happens as a result of individuals' self-generated thoughts, feelings, and behaviors directed to acquisition of personal learning goals (Ainley & Patrick, 2006). Zimmerman (1989) proposed a formulation of social cognitive views on self-regulated learning that are differentiated from Bandura's proposal (see Figure 2) in terms of a) their assumptions of reciprocal dependency among the triadic influences of personal, behavioral, and environmental dimensions as covert self-regulation; b) the key

processes of self-observation, self-judgment, and self-reaction; and c) the role of academic self-efficacy perceptions. The representation in Figure 2 illustrates the idea that not only is self-regulated learning determined by personal processes, but also both of those aspects are affected by environmental and behavioral events. A person's covert processes also reciprocally affect each other.

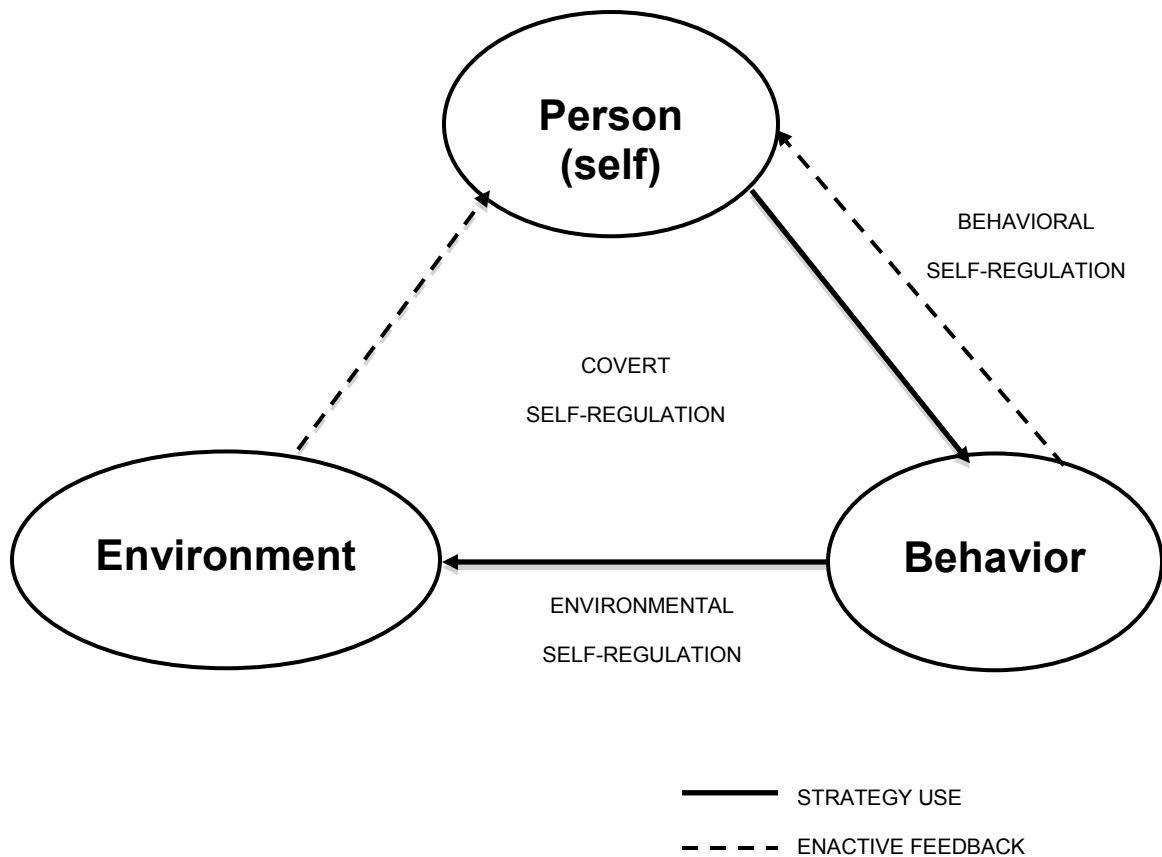


Figure 2. A triadic analysis of self-regulated functioning (Zimmerman, 1989).

Self-Regulated Learning (SRL)

The term self-regulated learning has been well known since the 1980s because it emphasizes the emerging autonomy and responsibility of students to regulate and control their own learning strategies (Bandura, 1986). Zimmerman (1989) gave this

definition: “Self-regulated learning is the ability to be metacognitively, motivationally, and behaviorally active participants in the learning process” (p. 4). Boekaerts and Corno (2005) also stated that one of the key issues in SRL is the students’ ability to select, combine, and coordinate cognitive strategies in an effective way. Pintrich (2000) defined SRL as “an active, constructive process whereby students set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment” (p. 453). Another definition is found in Tsai’s (2010) study: “SRL is defined as a student’s intentional efforts to manage and direct complex learning activities, and is composed of three primary components: cognitive strategy use, meta-cognitive processing, and motivational beliefs” (p. 563). These definitions come from the expressions of different theoretical perspectives on SRL, but they still reflect the similar concept that students can actively regulate motivation, cognition, and behavior through regulatory processes in order to achieve their learning goals.

In the 1988 study by Zimmerman and Martinez-Pons, SRL was described as actions directed at acquiring information or skills that involve agency, purpose, goals, and instrumental self-perceptions on the part of a student. It occurs when an individual uses personal (self) processes to strategically motivate, monitor, and control his or her behavior and the environment. They also pointed out that SRL seeks to explain student differences in motivation and achievement based on a common set of processes. In particular, self-regulated students are aware of their academic strengths and weaknesses. Zimmerman (2001) explained that self-regulated learning did not address intelligence or performance skills, but rather the self-directed cognitive processes that

allowed learners to alter mental abilities into task specific academic skills. He also presented that three common components emerged in definitions of self-regulated learning regardless of theoretical orientation; the first component was the student needed to have an awareness of the self-regulated processes and their potential to improve learning, the next component was self-monitoring that has to be part of the learning process, and the last component was that students needed an understanding of how and why processes, strategies or responses were chosen. He concluded that if a student did not use self-regulation strategies, he or she did not feel the strategies would work, or the student did not believe he or she was capable of using the strategies, or the student was not motivated to work toward the learning goal (Zimmerman, 2001). Recent research has revealed that the way in which students process and regulate their own learning is considered to be a significant factor in determining academic performance; in addition, self-regulated learners can hold incremental beliefs about intelligence and attribute their successes or failures to such factors as the effective use of particular self-regulatory skills within their control (Ainley & Patrick, 2006; Artino, 2007; Eom & Reiser, 2000; Pintrich, 2000; Whipp & Chiarelli, 2004).

Self-Regulated Learning Theories

There are a number of different theoretical views of SRL that describe different constructs and different conceptualizations. This literature review focuses on SRL theories that have been found in many educational research studies in the SRL field, two of which are Zimmerman's cyclic phase model and Pintrich's conceptual framework for self-regulated learning.

Zimmerman's Cyclic Phase Model

Zimmerman's self-regulated learning model is based on Bandura's social cognitive theory, which consists of three main factors: the person, the person's behavior, and the person's environment. These factors interact with each other in a cyclical process; when one factor changes during learning, the changes will be monitored and will lead to changes in the other factors. Based on this concept, Zimmerman conceptualized a phase model that acts in a cyclical manner (Schunk, Prinrich, & Meece, 2008). This cyclic phase model has three phases, which are Forethought, Performance, and Self-Reflection (see Figure 3).

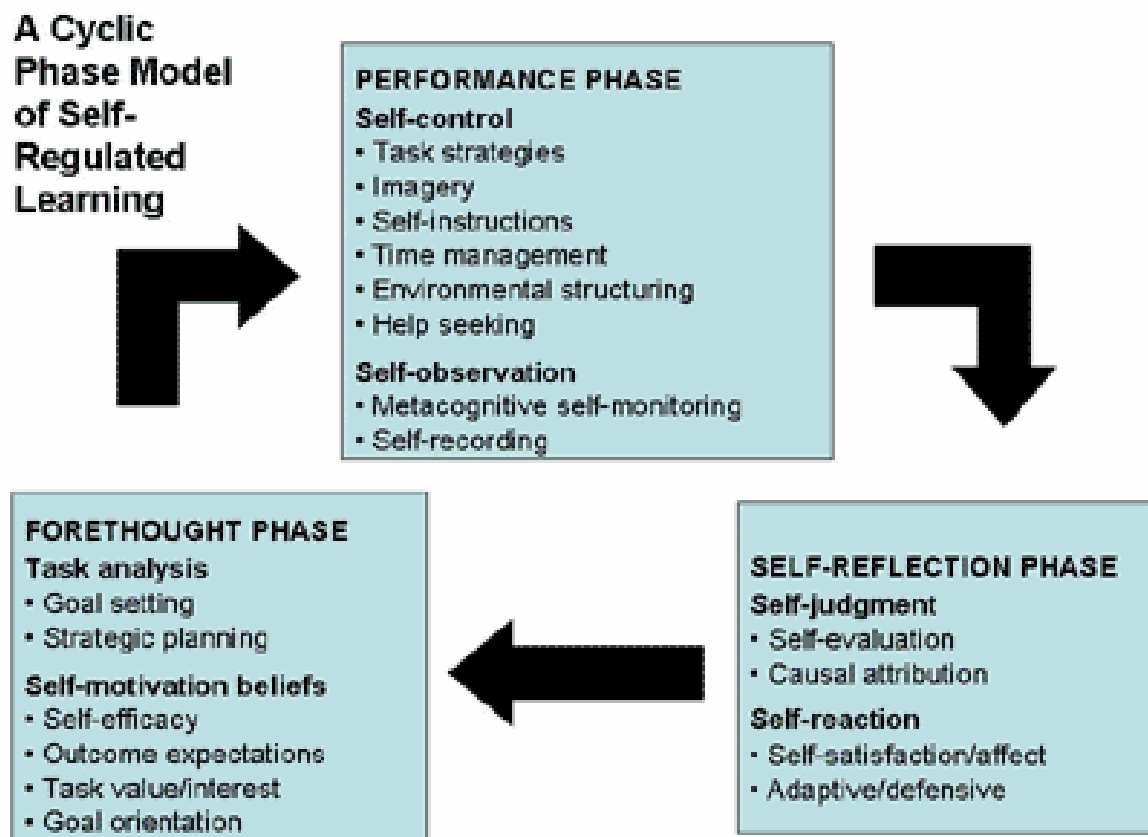


Figure 3. Phases and subprocesses of self-regulation (Zimmerman & Campillo, 2002).

Forethought or planning is the phase that precedes learning and sets the stage. This phase consists of two major self-regulatory skills: task analysis (goal setting and strategic planning) and self-motivation beliefs (self-efficacy, outcome expectations, intrinsic interest/value, and learning goal orientation). Performance or volitional control is the phase that processes occurrences during learning and thereby helps the learner stay on task. There are two major self-regulatory skills in this phase, which are self-control (task strategies, imagery, self-instructions, time management, environmental structuring, and help seeking) and self-observation (metacognitive self-monitoring and self-recording). The last phase is self-reflection, which evaluates a task that cycles back and influences forethought. This phase has two major subprocesses, which are self-judgment (self-evaluation and causal attribution) and self-reaction (self-satisfaction/affect and adaptive/defensive response) (Zimmerman & Campillo, 2002).

Pintrich's Conceptual Framework for SRL

According to Pintrich's (2000) definition of SRL, "self-regulated learning is an active, constructive process whereby students set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior in the service of those goals; it is guided and constrained by both personal characteristics and the contextual features in the environment" (p. 453). Pintrich and Zusho (2002) pointed out that this definition is relatively simple, but they elaborated further upon the concept of SRL in their discussion of the various processes and areas of regulation such as the application to learning and achievement in the academic domain. As a result, they developed a framework of a four-phase self-regulated learning model for classifying the different phases and areas of regulation (see Table 1).

Table 1

Phases and Areas for Self-Regulated Learning (adapted from Pintrich & Zusho, 2002, p. 252)

Phases	Area for Regulation			
	Cognition	Motivation/Affect	Behavior	Context
Forethought, planning, and activation	-Target goal-setting -Prior content knowledge activation -Metacognitive knowledge activation	-Goal orientation adoption -Efficacy judgments -Ease of learning judgments (EOLs), perceptions of task difficulty -Task Value activation -Interest activation	-Time and effort planning -Planning for self-observations of behavior	-Perceptions of task -Perceptions of context
Monitoring	-Metacognitive awareness and monitoring of cognition, judgments of learning (JOLs)	- Awareness and monitoring of motivation and affect	-Awareness and monitoring of effort, time use, need for help -Self-observation of behavior	-Monitoring of changing task and context conditions
Control	- Selection and adaptation of cognitive strategies for learning, thinking	-Selection and adaptation of strategies for managing motivation and affect	-Increase/decrease of effort -Persisting, giving up -Help-seeking behavior	-Change or renegotiation of task -Change or leaving of context
Reaction and reflection	-Cognitive judgments -Attributions	-Affective reactions -Attributions	-Choice behavior	-Evaluation of task -Evaluation of context

These four phases include 1) forethought, planning, and activation, which involves planning and goal-setting as well as activation of perceptions and knowledge of the task or context and the self in relation to the task; 2) monitoring, which concerns various monitoring processes that represent metacognitive awareness of different

aspects of the self and task or context; 3) control, which involves efforts to control and regulate different aspects of the self and task or context; and 4) reaction and reflection, which represents various kinds of reactions and reflections on the self and the task or context. They also claimed that these four phases represent a general time-ordered sequence in which an individual processes a task. There was, however, no extreme assumption about whether the phase structure was hierarchical or linear (Pintrich & Zusho, 2002).

Self-Regulated Learning and Academic Achievement

Research has found that self-regulation is an important aspect of learning and achievement in academic contexts (Puzziferro, 2008; Whipp & Chiarelli, 2004).

Students who are self-regulating are much more likely to be successful in school, more likely to learn more, and more likely to achieve at higher levels. Self-regulated learning will result in higher student achievement and scores as represented on many standardized tests (Puzziferro, 2008). Although many studies have been written about SRL in traditional classrooms, there are some studies emerging that begin to examine the impact of SRL in distance and distributed learning environments, specifically, whether SRL strategies should be implemented in a way similar to those that are implemented within traditional classroom environments, and whether there is a need to develop and recommend additional SRL strategies (Whipp & Chiarelli, 2004; Kitsantas & Dabbagh, 2004). Those studies have begun to provide general evidence that SRL can be facilitative in online learning environments. They also are beginning to provide guidance on general web-based pedagogical tools that can facilitate such learning outcomes.

Whipp and Chiarelli (2004) conducted case study research that investigated the general question of how SRL strategies could be translated to online environments, and also attempted to identify whether SRL strategies recommended for traditional classroom instruction should be applied to online learning environments or if different strategies were needed. They concluded that some traditional SRL strategies, such as time management and goal setting, could be directly applied to the online learning environments. Also, much of the research on SRL in online education assumed that effective implementation depends on students' confidence in their ability to achieve designated types of performances (Zimmerman, 2002).

Eom and Reiser (2000) examined the effects of the use of SRL strategy on the achievement and motivation of 37 middle school students taking a computer-based course. Importantly, the authors were trying to determine how varying the amount of student control within the computer-based course might affect the achievement and motivation of students high or low in SRL skills. The authors used a self-report instrument; students were classified as being either high or low self-regulated students and were then randomly assigned to either a student-controlled or a program-controlled version of a computer-based course. Results revealed that, regardless of how students rated their SRL skills, "students in the program-controlled condition scored significantly higher on a posttest than did students in the student-controlled condition" (Eom & Reiser, 2000, p. 247).

Experts in self-regulated learning believe that online learning environments require the student to assume greater responsibility for the learning process, and self-regulated learning components, which involve cognitive strategies, metacognitive

strategies, resource management and motivation, are an important part of academic success. Furthermore, many of these experts argue that self-regulatory skills are essential for success in these highly autonomous learning situations (Artino, 2007; Dabbagh & Kitsantas, 2005; Pintrich & DeGroot, 1990; Schunk & Zimmerman, 1998; Zimmerman & Martinez-Pons, 1990).

Gender differences in education have been recognized as an important issue for research for a long time, especially because of the increasing number of online female students. Recent research has found that the gender gap in Internet use has narrowed over the past several years; greater numbers of females have gone online (Kramarae, 2003; Price, 2006). Results from the same research also revealed that male and female students experience the online environment differently with respect to several factors, such as performance, motivation, perceptions, study habits, and communication behaviors.

In a (2001) study by Sullivan, the experiences of male and female college students in the online environment were analyzed, and significant differences were found between the way male and female students regard flexibility, interaction, shy and quiet students, self-discipline, and self-motivation. Price (2006) also found that online female students are confident, independent learners and may outperform their male counterparts online. Parallel research findings by Gunn, McSporrán, Macleod, and French (2003) showed there are gender differences in styles of participation and contribution in computer mediated communication.

Zimmermann and Martinez-Pons (1990) examined 5th, 8th, and 11th grade student differences in self-regulated learning with respect to several variables including gender.

They found that male and female students demonstrated differences in using self-regulated learning strategies in their learning: girls tended to employ self-monitoring, goal setting, planning, and structuring of their study environment significantly more often than boys. Similarly, Lee (2002) found three main gender difference issues in SRL strategies, which are 1) the styles, purposes, and dynamics of social interactions, 2) motivational factors, and 3) the styles and frequencies of expression, discussion, or feedback. Chyung (2007) also found that female students improved their self-efficacy significantly more and scored significantly higher on the final exams than male students. Online Learning.

However, there are some conflicting findings have been found in regard to relations between gender and dependent variables in online learning. For instance, Astleitner and Steinberg (2005) reported gender effects are insignificant in the discussions of meta-analysis of 14 empirical studies dealing with Web-based learning and gender effects. Yukselturk and Bulut (2009) found that gender variable was unrelated to learning outcomes in online course. Sierra and Wang (2002) analyzed the data from online observations, survey, and chat transcripts for the online discussions. Their findings from several sources did not show any significant gender differences in the online discussions.

Prior experiences such as the number of previous online courses and the Internet use experience are found somewhat influenced the student's achievement. Artino (2007) found much larger effects when attempting to predict military students' satisfaction ($R^2 = .65$) and choice behaviors ($R^2 = .40$) using a linear combination of students' prior experience, task value, and self-efficacy within the context of self-paced

online learning. In Wang (2010) study also found that the number of previous online courses positively influenced the effectiveness of student's learning strategies.

Online Learning

Online learning has become a vital component of educational pedagogy worldwide over the past two decades. An online learning environment refers to educational courses delivered through the Internet or using Web-based instructional systems either in real-time (synchronously) or asynchronously. Online learning has been promoted as a more cost effective, convenient, and capable way of increasing opportunities for lifelong learning (Olson & Wisner, 2002). According to Reid (2005), online learning is easy and inexpensive compared to traditional learning methods. Richardson and Swan (2003) explained that online learning has shown several advantages over traditional learning, specifically in allowing students an opportunity for "learning anytime and anywhere." Moreover, online learning allows students to reflect on the learning materials and responses, and it allows them to work at their own pace, regardless of race, gender, disability, or appearance (Richardson & Swan, 2003).

Many researchers have made a comparison between online courses and traditional learning methods; however, most of the studies have found no significant difference in learning outcomes between the two learning environments. The overall conclusion from those comparative studies has been that an online learning course is as effective as (but not better than) traditional classroom teaching (Johnson, Shaik, & Palma-Rivas, 2000; Parker & Gemino, 2001; Paskey, 2001). Focusing on learning outcomes to determine the effectiveness of online learning, several studies have found that no significant difference exists between online and traditional methods in terms of

exam results (Carey, 2000). Additionally, many research studies have provided useful recommendations and methods for assessing online learning. For instance, Meyer (2002) suggested the use of student learning outcomes for evaluating and understanding whether and how well improved have occurred through new learning approaches. He identified certain issues involved in relying on learning outcomes, which are 1) the difficulty in quantifying or reliably expressing what learning is desired, and 2) the assessment methods chosen tend to shape what is being assessed. He also suggested that techniques of assessing outcomes could include in-class tests, professional entry exams, portfolios, and simulations (Mayer, 2002).

Online Learning in Thailand

Thailand has been using online technology in higher education since the year 1997 and continues to promote it as the explanation for a work force skilled in the use of information and communication Technologies (ICT) (Suanpang & Petocz, 2006). An urgent need for education reform, the right of all children to twelve years of basic quality education free of charge, and the development of the teaching profession were addressed in the 1999 National Education Act (NEA). The act focuses on improving the efficiency and effectiveness of education. As a result, a master plan for ICT use in education was developed for the years 2004-2006. There are four major strategies: 1) the use of ICT to improve teaching and learning, 2) the use of ICT to enhance educational management and service effectiveness, 3) personnel training and development, and 4) ICT equipment provision and distribution for all educational levels. At that time, the Ministry of Education (MOE) suggested to the public that all students in the country should be able to access the Internet by the year 2006. MOE also pushed

forward a policy to support the project named “100 Research and Development” in terms of ICT usage in education, including high quality digital learning and teaching materials for developing the level of ICT skills and attitudes necessary to encourage a knowledgeable society. This policy signified the beginning of online learning in Thailand as well.

The Thailand Cyber University Project

The Thailand Cyber University Project (TCU) is a special project established by the Office of the Commission on Higher Education (OCHE), and the Ministry of Education. TCU has been essential in assisting all the higher education institutes in developing and delivering distance learning in online learning environments. According to the 1999 National Education Act (NEA), one of the most important government issues is to provide more educational opportunities by widely and equally enhancing knowledge regardless of individuals’ economic situations for Thai people in both urban and rural areas. In response to this policy, OCHE has been developing and providing the following opportunities:

- Developing the UniNet IT infrastructure, to connect every institution of higher education to the Internet for education and research
- Supporting the production of courseware for dissemination via UniNet
- Developing the Learning Management System (LMS)
- Developing the e-library, e-community, and the learning resource sharing

Following up these opportunities, TCU has aims to ensure that all online courses are of a high quality and meet government standards, promote the sharing of teaching resources and human resources, and also introduce a credit exchange system between

higher education institutions. One of TCU's stated missions is to create a mechanism to promote and support the dissemination of all knowledge, including advanced technologies and local knowledge in the form of non-formal E-learning. Given the missions above, TCU has offered the public 4 different online courses, which are self-paced learning (learners can self-study any of more than 300 courses free of charge), certificate programs (semi-formal learning in both short-term and long-term courses free of charge or with a scholarship provided), bachelor's degrees (TCU cooperates with higher educational institutions; in this program, learners need to enroll with tuition and fees), and master's degrees (TCU cooperates with higher educational institutions, and learners need to enroll with tuition and fees).

Measurements for Self-Regulated Learning

The two instruments for measuring SRL that have been used widely in previous studies and that are used in this study are the Motivation Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1993) and the Self-Regulated Learning Interview Schedule (SRLIS; Zimmerman & Martinez-Pons, 1986). The Motivation Strategies for Learning Questionnaire (MSLQ)

The MSLQ was developed by Pintrich, Smith, Garcia, and McKeachie (1993) using the social cognitive theory of motivation and self-regulated learning in order to measure college students' motivation and their use of learning strategies (Pintrich et al., 1993). The MSLQ is a self-report instrument, consisting of 81 items, and a 7-point Likert-type scale. It takes 20 to 30 minutes to complete the self-report, which asks students to report on concrete behaviors in which they engage (meaning the items ask students about actual behaviors they might use when they study their course material).

In the development of the MSLQ, a learner was considered to be an active processor of information, in which beliefs and cognitions are important mediators of instructional input and task characteristics (Artino, 2005). This self-report instrument led to the conception of the motivation and learning strategies contexts by performing assessments from course to course depending on the student's interest and performance efficacy, and on the nature of the course (Artino, 2005).

The MSLQ is composed of two broad categories: a motivation section and a learning strategies section. The motivation section comprises 31 items of three motivational constructs: expectancy (Self-Efficacy and Control Belief), value (Intrinsic Goal Orientation, Extrinsic Goal Orientation, and Task Value Beliefs), and affect (Anxiety about Tests). Another 50-item learning strategies section includes three general constructs: cognitive, metacognitive, and resource management. The cognitive construct includes four subscales of basic and complex strategies: Rehearsal, Elaboration, Organization, and Critical thinking. The metacognitive construct consists of three subscales: Planning, Monitoring, and Regulating. The resource management construct elaborates on regulatory strategies such as Time Management and Environmental Structuring, Effort Regulation, Peer Learning, and Help-Seeking (see Table 2).

In the study by Pintrich et al. (1993), two confirmatory factor analyses were conducted: one for a motivation subscale and another for a learning strategies subscale. They examined the fit between the MSLQ items and theoretical concepts. The results regarding the predictive validity on the correlation between the MSLQ subscales scores and the standardized final course grades illustrated that the MSLQ is a valid

measure for motivation and learning strategies. Also, the results from the confirmatory factor analysis indicated a model fit. Table 2 illustrates the subscales that correspond with each of the two sections of the MSLQ, and also presents the internal reliability coefficients Cronbach's alpha and outlines the items of the instrument used in the study of Pintrich et al. (1993).

Table 2

Subscales, Internal Reliability Coefficients, and Items Related to SRL Behaviors for the MSLQ (Modified from Pintrich et al., 1993)

Scale	Coefficients Alpha	Items Comprising the Scales
Motivation Scales		
Intrinsic Goal	0.74	1, 16, 22, 24
Extrinsic Goal	0.62	7, 11, 13, 30
Task Value	0.90	4, 10, 17, 23, 26, 27
Control of Learning Beliefs	0.68	2, 9, 18, 25
Self-Efficacy for Learning and Performance	0.93	5, 6, 12, 15, 20, 21, 29, 31
Test Anxiety	0.80	3, 8, 14, 19, 28
Learning Strategies Scales		
Rehearsal	0.69	39, 46, 59, 72
Elaboration	0.75	53, 62, 64, 67, 69, 81
Organization	0.64	32, 42, 49, 63
Critical Thinking	0.80	38, 47, 51, 66, 71
Metacognitive Self-Regulation (Planning, Monitoring, and Regulating)	0.79	33, 36, 41, 44, 54, 55, 56, 57, 61, 76, 78, 79
Time/Study Environment Management	0.76	35, 43, 52, 65, 70, 73, 77, 80
Effort Regulation	0.69	37, 48, 60, 74
Peer Learning	0.76	34, 45, 50
Help Seeking	0.52	40, 58, 68, 75

Table 3

Self-Regulated Learning Strategies Categories (Adapted from Zimmerman and Martinez-Pons, 1986)

Categories of Strategies	Definitions
1. Self-evaluation	Statements indicating student-initiated evaluations of the quality or progress of their work
2. Organizing and transforming	Statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning
3. Goal-setting and planning	Statements indicating students' setting of educational goals or sub-goals and planning for sequencing, timing, and completing of activities related to those goals
4. Seeking information	Statements indicating student-initiated efforts to secure further task information from nonsocial sources when undertaking an assignment
5. Keeping records and monitoring	Statements indicating student-initiated efforts to record events or results
6. Environmental structuring	Statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier
7. Self-consequences	Statements indicating student arrangement or imagination of rewards or punishment for success or failure
8. Rehearsing and memorizing	Statements indicating student-initiated efforts to memorize material by overt or covert practice
9-11. Seeking social assistance	Statements indicating student-initiated efforts to solicit help from peers (9), teachers (10), and adults (11)
12-14. Reviewing records	Statements indicating student-initiated efforts to reread tests (12), notes (13), or textbooks (14) to prepare for class or for further testing
15. Other	Statements indicating learning behavior that is initiated by other persons such as teachers or parents, and all unclear verbal responses

The Self-Regulated Learning Interview Schedule (SRLIS)

Zimmerman and Martinez-Pons (1986) developed the Self-Regulated Learning Interview Schedule instrument in order to compare the degree and frequency of students' use of self-regulatory strategies as well as their ability to do better on the task itself. SRLIS is an interview protocol that presents eight different learning contexts followed and then asks the interviewees what they would do in those learning contexts. Interviewees listen and respond to questions or prompts referring to the eight learning contexts by indicating the activity or behavior that they would adopt. Then the frequency of those actions or behaviors previously identified is ascertained. The learning contexts in SRLIS were designed to elicit the self-regulated learning behaviors used by the interviewees in the learning contexts described. Interviewees' responses are categorized into 15 self-regulated learning strategy categories (see Table 2). SRLIS is an open-ended self-report instrument, and the data collected are measured according to strategy use, strategy frequency, and strategy consistency. In the Zimmerman and Martinez-Pons (1986) study, they summarized the interview data by means of three coding procedures, which are the selection of the strategy to be used (SU), how often a particular strategy was mentioned in each context (SF), and whether or not the strategy was consistently mentioned across different contexts (SC). The authors also found that the results of discriminant function analysis indicated that the SRLIS can successfully predict the students' membership in their respective achievement groups based on their reported SRL strategies. Moreover, the regression analysis indicated that SRLIS results were a good predictor of standardized achievement test scores.

The Modified MSLQ (Artino & McCoach, 2008)

The Modified MSLQ was developed by Artino and McCoach (2008) in order to measure self-regulated learning in online learning settings. The Modified MSLQ was also used in the study of Wang (2010) to examine the relationship among students' self-regulated learning and course outcomes in online learning environments of 256 students enrolled in online courses at the university in the state of Alabama. The Modified MSLQ consists of two major domains, which were motivation and learning strategy. The motivation domain includes three subscales: Task Value, Self-Efficacy, and Test Anxiety. While the learning strategy domain includes four subscales: Elaboration, Critical Thinking, Metacognitive Self-Regulation, and Time/Study Environmental Management (see Table 4).

Table 4

Items in Each Subscales and Internal Reliability Coefficients for the Modified MSLQ (modified from Wang, 2010, p. 70)

Subscales	Item #	Range of Factor Coefficients	Cronbach's alpha
Motivation Scales			
Self-Efficacy	13, 1, 12, 19, 4, 9, 18, 7	0.562 - 0.954	.947
Test Anxiety	11, 17, 3, 5, 8	0.717 – 0.855	.846
Task Value	14, 16, 10, 15, 6, 2	0.824 – 0.913	.945
Learning Strategies Scales			
Elaboration	18, 5, 11, 17, 25, 22, 26, 31	0.470 – 0.814	.873
Time/Study Environmental Management	28r, 10r, 30r, 23, 6, 19, 2	0.389 – 0.789	.818
Metacognitive Self-Regulation	3, 7, 13, 14, 27, 21, 12, 16	0.349 – 0.782	.813
Critical Thinking	24, 4, 8, 9, 20	0.519 – 0.808	.837

There were 19 items in the motivation part and 31 items in the learning strategy part. Participants respond to each item using a 7-point Likert-scale, rating from 1 (not at all true of me) to 7 (very true of me). Five out of 31 items from learning strategy part were reverse coded. The higher scores indicated higher level of SRL strategies. In Wang (2010) studied, the internal consistency using Cronbach's alpha for each subscale: self-efficacy was 0.95, test anxiety was 0.85 and task value was 0.95. While each subscale in learning strategy domain was 0.87 for elaboration, 0.82 for time/study environmental management, 0.81 for metacognitive self-regulation, and 0.84 for critical thinking (see Table 4).

CHAPTER 3

METHODOLOGY

This chapter focuses on the methods used in the current study. A pilot study is first described, followed by descriptions of the method and research design, variables, participants, course contents, the approach of Thailand Cyber University Project (TCU) online learning system, and the instrumentation used in this study. In the last section, a general overview of each procedure involved in the data analysis technique is presented.

Pilot Study

In order to obtain reliability information for the instrument online survey and to determine the feasibility of data collection procedures, the researcher implemented a pilot study in the summer of 2010. Although the procedures were tested as part of the pilot study, the primary purpose was to examine the content validity and reliability of the self-regulated learning subscales from the instrument, Motivated Strategies for Learning Questionnaire (MSLQ), developed by Pintrich and DeGroot (1990). The purpose of the pilot study was to investigate the correlation between the demographic data (such as classification, gender, age, and online learning experiences) and the level of self-regulated learning (SRL) in online learning environments. The 3 questions in the study were 1) How are the learners' motivational components related to the learners' self-regulation strategies? 2) Does learners' demographic information affect their self-regulated learning strategies? and 3) Does prior experience in an online learning environment affect self-regulated learning strategies?

The independent variables were the students' demographic information, which consisted of educational classification, level of graduation, academic status, GPA,

gender, age range, and marital status. Other independent variables were prior experiences, including daily Internet use, Internet experience, online course experience, and hybrid course experience. The dependent variables were selected from the literature review and were based on the Motivated Strategies for Learning Questionnaire (MSLQ) in the study of Pintrich and De Groot (1990). The 5 self-regulatory variables used in the study were a) intrinsic goal, b) self-efficacy, c) test anxiety, d) cognitive strategy, and e) study management (Pintrich & De Groot, 1990). The instrument has two parts; Part 1 consists of demographic questions and learners' experiences, while Part 2 is comprised of 44 questions from the MSLQ. Participants responded to questions about their intrinsic goals, self-efficacy, test anxiety, cognitive strategy, and study management. Participants were instructed to respond to the items on a 7-point Likert scale from 1 (*not at all true of me*) to 7 (*very true of me*).

With the assistance of the instructors, the online survey link was distributed to online students that were drawn from a simple random sampling from Thai undergraduate and graduate students over the age of 18, who enrolled in either an online or a hybrid course at Chulalongkorn University in Thailand. The survey was open and accessible for 4 weeks and received 88 responses, and all of the respondents completed the survey ($n = 88$). The level of education of the sample was 35% doctoral, 32% master's, 26% other (certificate), and 7% undergraduate students. There were 48 males, 17 enrolled as full time students, and 31 as part time students. There were 40 females, 17 as full time students, and 23 as part time students.

The descriptive analysis resulted in all 44 SRL-questions, included the negative questions that were reflected before the analyzing process, having been responded to

by 88 subjects ($N = 88$). Reliability analysis revealed that all of the subscales had good internal consistency reliabilities. The alpha values for the first 5 factors, intrinsic goals, self-efficacy, test anxiety, cognitive strategy, and study management, were quite strong ($\alpha = 0.91$, $\alpha = 0.89$, $\alpha = 0.77$, $\alpha = 0.86$ and $\alpha = 0.87$ respectively). The correlational analysis revealed that the overall correlation between motivational and self-regulation strategy components had a significance correlated at the .01 level ($r = .37$, $p < .01$). Also, there were significant correlations between motivational subscales and self-regulation strategy subscales. However, test anxiety was not found to be significantly correlated with any other self-regulation subscales. The comparison of means revealed that 3 demographic factors, educational level, graduated level, and age range, were correlated with statistically significant differences in the self-regulation subscale. The results from multiple regression indicated that daily Internet use significantly predicted the level of intrinsic goal and self-efficacy. Hybrid course experience and Internet experience also significantly predicted the level of study management. Several limitations were found in the pilot study; sample size needed to be increased and needed to be drawn from a wider geographic area. The MSLQ instrument, which was adapted from the research studies by Pintrich and De Groot (1990) and translated into Thai, might not be appropriate to assess effective learning strategies in Thai online learning settings since the cultures surrounding the learning activities differed from those relevant to the American studies. Also, the 5 strategies presented in the study might not include all of the learners' behaviors. The study concluded that Thai online learners need more than 5 SRL strategies to be successful in online learning in Thailand.

Method and Research Design

In the full current study, a mixed methods research design with a self-report questionnaire (Modified MSLQ) and a semi-structured interview were used. In this research design, participants can truly present their experiences in online learning environments without being concerned about social expectations (Wang, 2010). For the quantitative method, the correlational study describes the 7 SRL characteristics (task value, self-efficacy, test anxiety, elaboration, critical thinking, metacognitive self-regulation and time/study environmental management) based on the study model of Pintrich et al. (1993) and Artino and McCoach (2008), and investigates their relationship with academic achievement based on a) completion and b) course grades (for those who completed the course). Also, the participants' demographic data, such as gender, age range, marital status, educational level, Internet experience, and online course experience, were determined in order to discover whether significant differences existed among online learners in different SRL characteristics.

For the qualitative method, the semi-structured interview was developed based on the results of the quantitative analyses in order to provide a deeper understanding of the SRL strategies used by online learners. The data for this study are based on learners' experiences taking an online learning course in the certificate programs of the Thailand Cyber University Project (TCU) at the website, www.thaicyperu.go.th. Participants responded to a self-report questionnaire, the Modified Motivated Strategies for Learning Questionnaire (Modified MSLQ), during the course period. At the end of course term period, seven participants from successful groups were asked to participate in the interview process. The semi-structured interview was used to elicit more

information about learners' self-regulated learning strategies in their online learning courses. Academic achievement was measured by: a) collection of the number of successful versus Unsuccessful online learners and b) collection of the data on course grades of successful online learners at the end of course period.

Research Questions

1) What is the existing level of Thai online learners' SRL in online learning environments?

2) What is the relationship between SRL characteristics and academic achievement in Thai online learning environments?

3) Are there any differences in SRL characteristics among online learners in different demographic subgroups?

Hypotheses

Hypothesis 1: Successful online learners will have levels of SRL different from those of unsuccessful online learners. This will also be true for major disaggregated groups based on a) gender, b) educational level, c) age range, d) marital status, e) Internet use experiences, and f) online course experiences.

Hypothesis 2: Among successful online learners, those who have higher levels of SRL will have higher course grades.

Hypothesis 3: Among online learners, the levels of SRL characteristics will be different among different demographic groups.

Variables

Independent Variables

The present study focuses on the SRL level based on academic achievements, course completion, and course grades. The main independent variables were 7 SRL characteristics were task value, self-efficacy, test anxiety, elaboration, critical thinking, metacognitive self-regulation, and time/study environmental management; the other 6 were determined at the online learners' demographic information, gender, educational level, age range, marital status, Internet experience, and online course experience, to see if significant differences in SRL levels existed between these demographic subgroups. For instance, this study examined the gender differences in SRL among Thai online learners, taking into consideration previous research showing that male and female learners demonstrated differences in using self-regulated learning strategies in their learning (Bidjerano, 2005; Hargittai & Shafer, 2006; Lee, 2002; Zimmermann & Martinez-Pons, 1990).

Dependent Variables

Two main dependent variables were investigated in the current study: the number of learners that succeeded in the online learning course versus unsuccessful learners; and the academic achievement, based on course grades, at the end of the course term and periodically collected from all of the major learning activities of the successful online learners. The other variables focused on in this study were the differences in 7 SRL characteristics based on the studies of Pintrich et al. (1993) and Artino and McCoach (2008). The study examined whether any of the levels of 7 SRL subscales were different among the demographic subgroups. In addition, the SRL

characteristic variables (learning strategy domain) were examined in detail in the qualitative portion of the study in order to obtain more information from the interviewees' responses about self-regulated learning strategies they had used in online learning courses. The responses were categorized into 4 categories of SRL learning strategy, and another category was designated for online learning tools based on the SRL theoretical context and the results of the quantitative analyses in this study.

Participants

The participants in this study were Thai online learners enrolled in an online learning course in the certificate programs of the Thailand Cyber University Project (TCU) at the website www.thaicyberu.go.th. With the permission of TCU (Appendix C) to conduct research on TCU's website, the researcher met with the director of the Thailand Cyber University Project and TCU's instructors to present the research study and to solicit participation from online learners enrolled in TCU's online learning courses. 208 of the 580 online learners enrolled in at least 1 of 7 online course programs responded to a self-report questionnaire, the Modified Motivated Strategies for Learning Questionnaire (Modified MSLQ), during the course period. Academic achievement was measured by a) the number of successful versus unsuccessful online learners, and b) collected data on course grades of online learners who completed all course's activities at the end of course term period, with the assistance of TCU's instructors.

Via the Web-based online survey site named KwickSurveys.com, the human subject informed consent form for this study (Appendix B) was translated into a Thai version and was administered in a special way. A letter that offered online learners an

opportunity to participate in the study, together with the informed consent form, was sent to each online learner via email. Participants were provided with a detailed explanation about the purpose of the study and were notified that information obtained during the course of the study would remain confidential. A web link to the Web-based online survey was included in the same email. Participants' completion of the online survey questionnaires was considered to be an electronic signature signifying their consent to participate in the study. Only online learners who completed all of the online survey questionnaires qualified as research participants in this study.

Table 5

Respondent Distributions for Gender, Age Range, Marital Status, and Educational Level

	Frequency	Percent
Gender		
Male	98	52.1
Female	90	47.9
Age Range		
18-20	0	-
21-25	7	3.7
26-30	60	31.9
31-40	73	38.8
41-50	47	25.0
51-60	1	0.6
Above 60	0	-
Marital Status		
Single	85	45.2
Married	89	47.3
Separated	0	-
Divorced	11	5.9
Widowed	3	1.6
Educational Level		
Less than high school	0	-
High School	0	-
Vocational School	0	-
2-year College	4	2.1
Bachelor	36	19.1
Master	128	68.1
Doctoral	20	10.6
Professional Degree	0	-

Five hundred eighty online learners were enrolled in the Certificate programs of the Thailand Cyber University Project (TCU); all were emailed and invited to participate in the study. Two hundred eight individuals responded to the surveys, with a response rate of 35.86%. Data cleaning was performed to eliminate missing responses and data errors in order to improve the data quality. Twenty survey responses were deleted for the following reasons: 9 learners did not complete the survey, 8 survey responses showed an error in the response set that affected more than 10 item questions in a row, and the other 3 completed the survey twice. In all, 188 responses were maintained in the sample for the current study. Participants in this study were divided into six demographic groups, which are gender, age range, marital status, educational level, Internet experience, and online course experience. Table 5 reports the demographic distributions for gender, age range, marital status, and educational level. There were more male respondents than female respondents (52.1% and 47.9% respectively). Most of the respondents (38.8%) were 31-40 years old, with no respondents under 21 or above 60 years old. The number of single respondents and married respondents was almost the same (45.2% and 47.3% respectively). The majority of the respondents were at the Master's degree level of education (68.1%), and the next group was at the Bachelor's degree level of education (19.1%).

Table 6 presents the demographic distributions for Internet experience and online course experience. In terms of Internet experience, the largest group of respondents (83%) was a group of online learners who had more than 6 years of Internet use experiences. While most of the respondents (44.7%) never had online course experience before this study, the next largest group (20.2%) was the group of online

learners who had 5 or more of online course experience.

Table 6

Respondent Distributions for Internet Experience and Online Course Experience

	Frequency	Percent
Internet Experience		
Never	0	-
Less than 1 year	3	1.6
1-3 years	11	5.9
3-6 years	18	9.5
More than 6 years	156	83.0
Online Course Experience		
Never	84	44.7
1 course experienced	17	9.0
2 courses experienced	27	14.4
3 courses experienced	19	10.1
4 courses experienced	3	1.6
5 courses or more	38	20.2

Due to the fact that the number of responses in each demographic subgroup was quite different (some subgroups had a really high number of responses, some had a small number, while others had no response at all), there may not be an adequate representation of the population, as some subgroups could not be compared to others. In order to get better results, the researcher proceeded to rearrange some of the subgroups of the demographic groups. The results are shown in Table 7.

The age range group was rearranged from 7 groups to 3, and most of the respondents in the successful online learners group (37%) were 21-30 years old. The marital status group was used in only 2 subgroups in a comparison analysis. The educational level group was rearranged from 7 groups to 2. About eighty percent of both successful and unsuccessful online learners were graduate students. All of these subgroups were represented separately in the completion groups of unsuccessful (26.6%) and successful online learners (73.4%).

Table 7

Rearranged Respondent Distributions for Gender, Age Range, Marital Status, and Educational Level

Demographic	<i>Unsuccessful (N=50)</i>		<i>Successful (N=138)</i>	
	Frequency	Percent	Frequency	Percent
Gender				
Male	26	52.0	72	52.2
Female	24	48.0	66	47.8
Age Range				
21-30	16	32.0	51	37.0
31-40	24	48.0	49	35.5
41-50	10	20.0	37	26.8
51-60	0	0	1	0.7
Marital Status				
Single	20	40.0	55	47.1
Married	23	46.0	66	47.8
Others	7	14.0	7	5.1
Educational Level				
Undergraduate	13	26.0	27	19.6
Graduate	37	74.0	111	80.4

Table 8

Rearranged Respondent Distributions for Internet Experience and Online Course Experience, Separated into Completion Groups

	Frequency	Percent
Unsuccessful online learners	(N=50)	
Internet Experience		
Less than 6 years	15	30
More than 6 years	35	70
Online Course Experience		
Never	25	50
Some	25	50
Successful online learners	(N=138)	
Internet Experience		
Less than 6 years	17	12.3
More than 6 years	121	87.7
Online Course Experience		
Never	59	42.8
Some	79	57.2

In Table 8, Internet experience is shown rearranged from 5 groups to 2 groups, and most of the successful online learners (87.7%) had more than 6 years of Internet use. Online course experience was rearranged from 5 groups to 2 groups, and almost half of the successful online learners (42.8%) had had no experience in online learning courses before this study.

Course Contents and Approach

The course content for the current study consisted of 7 different certificate program courses of the Thailand Cyber University Project (TCU). Three of those were courses for “E-learning professional programs” consisting of E-learning for teachers, E-learning for courseware designers, and E-learning for project managers. The other 4 were “IT E-learning training programs” consisting of Create a Web Page with Microsoft Word, Create an E-Book from the Web, Create an E-learning Course with eXe, and Movie Editing. All seven courses are provided 100% online via the TCU Learning Management System (TCU-LMS) on the website, www.lms3.thaicyberu.go.th (see Figure 4).

TCU online learners had to commit to 6-8 hours per week for a 3-unit course, which would be devoted to the following learning activities: 1) 3 hours for self-study on the interactive multimedia; 2) 1-2 hours for reading the reading assignments; 3) 1-2 hours for working on learning activities, discussion, and collaborative learning; and 4) 2-4 hours for research assignments and reports. According to TCU’s requirements, in order to succeed in each online course, online learners have to study via the TCU-LMS, participate in all learning activities, including WebBoard and Chat rooms, turn in all assignments on time, and understand TCU’s online learning guidelines.



Figure 4. The Thailand Cyber University Project website.

Instrumentation

In the quantitative method portion of this study, the modified and translated English-Thai version of the MSLQ, which was originally compiled by Pintrich et al. (1993) and modified by Artino and McCoach (2008), was used. The Modified MSLQ, a self-report Likert-type questionnaire, consists of 50 items from 2 specific domains, which are motivational beliefs and learning strategy use. Participants were required to give responses to the items on a 7-point rating scale with 1 representing the response *not at all true of me* and 7 representing *very true of me* at the extremes.

The Modified MSLQ (Artino & McCoach, 2008) was translated into an English-Thai version. The translation was done with the assistance of an English-Thai teacher, who could speak both Thai and English, and a professional translator from an English

institute in Thailand as well. Then the translated English-Thai version was given to the director of the Thailand Cyber University Project and one of TCU's instructors in order to verify the content validity of SRL in online learning environments. This was done to ensure that the wordings and items of the Modified MSLQ were appropriate.

In the qualitative method portion of the study, which was derived based on the quantitative results, the 4 SRL characteristic variables in the domain of learning strategy were investigated in significant detail in order to provide further information from participants about the SRL strategies used in their online learning courses and to categorize them into 4 categories of SRL strategies based on the SRL theoretical context in the present study. The semi-structured interviews were designed based on the results of the quantitative analyses in this study. The interviews were conducted with participants at the end of the course term period on the course's evaluation day, if they were willing to participate.

The notion of SRL in the current study, which is composed of two main domains, the motivational beliefs domain and the learning strategies domain, is based on the studies of Pintrich et al. (1993), Artino and McCoach (2008), and Zimmerman and Martinez-Pons (1986). The motivational beliefs domain consists of 3 subscales: task value, self-efficacy, and test anxiety. The learning strategies domain consists of 4 subscales: elaboration, critical thinking, metacognitive self-regulation, and time/study environmental management. The 4 learning strategy categories (Artino & McCoach, 2008) were used to categorize the interviewees' responses.

Data Analysis

Descriptive statistical operations were performed to briefly summarize the

characteristics of the basic demographic subgroups (gender, age range, educational level, marital status, Internet experiences, and online course experiences) and to describe each item question and its SRL-subscales. A mean score for the items associated with a particular subscale was computed as well. Cronbach's Alpha reliability was tested to determine the internal consistency of the items in each subscale. According to Dunn-Rankin, Knezek, Wallance, and Zhang (2004), the factor analysis procedure determines the strength of the correlation between the items and subscales; therefore, factor analyses were also conducted to examine the covariance structure of a set of subscales and to provide an explanation for the relationship among those subscales in the present study.

To answer the research question regarding the comparison between two extreme groups (successful versus unsuccessful online learners) and the SRL characteristic variables, a Bivariate-Pearson correlation coefficient was conducted first to assess the overall association among those SRL characteristic variables, followed by independent sample *t-tests* to compare the mean differences between successful and unsuccessful online learners. Cohen's *d* was used as a measure of effect size. According to Cohen (1992), the difference can be compared to Cohen's estimates of what is typical of a small ($d = 0.2$), medium ($d = 0.5$), or large ($d = 0.8$) effect.

The next concern of the study regarded the relationships among the 7 SRL-subscales and academic achievement among successful online learners. In order to determine the predictive power of the SRL characteristics for academic course grades, a multiple linear regression analysis was conducted, and a regression equation was created. Lastly, the comparison of means, an independent sample *t-test* and general

linear model (GLM), was performed to compare the 6 demographic subgroups with each of the SRL-subscales in order to provide a clear basic picture of the interrelationships among the learners' demographics and their SRL characteristics. The research conceptual framework is presented in Figure 5 below.

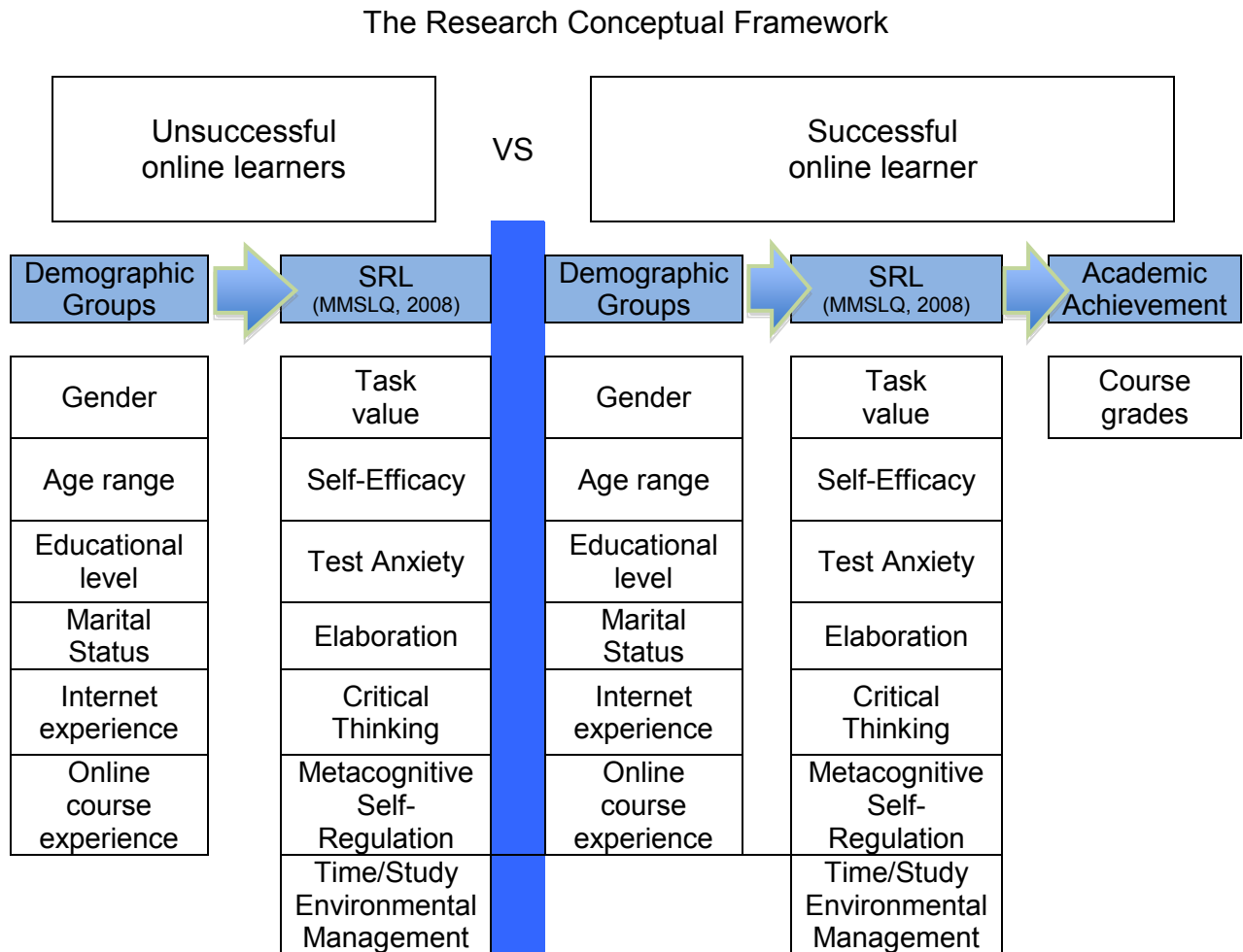


Figure 5. Diagram representing the research conceptual framework.

CHAPTER 4

RESULTS

This chapter presents the results of research analysis from the Modified Motivated Strategies for Learning Questionnaire (MMSLQ) surveys and the semi-structured interviews. Demographic information, factor analysis, Pearson correlation, an independent sample *t-test*, regression analysis, and a General Linear Model (GLM) analysis were presented as data analysis techniques. Learners' final course grades and course completion, as the measure for academic achievement, were obtained from the instructor after the course term was over. Data from the semi-structured interviews are presented to provide a rich descriptive and narrative understanding of the phenomenon of Self-Regulated Learning (SRL) strategies used in online learning environments in Thailand. The quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 20 for Windows, and the qualitative data were analyzed using Nvivo software version 9.

Academic Achievement Results

In terms of academic achievement, the present study measured course outcomes by a) the number of successful versus unsuccessful students in the online learning courses and b) student course grades throughout the long-term online learning courses. Table 9 shows the frequency data of successful compared to unsuccessful online learners in all seven online courses of the Thailand Cyber University Project (TCU) certificate programs. Of the 188 students taking the 7 different online courses, 50 were unsuccessful online learners (26.6%), and 138 were successful online learners (73.4%).

Table 9

Frequency Data of Successful Versus Unsuccessful Online Learners

TCU's Courses	Over all (N=188)		Successful (N=138)		Unsuccessful (N=50)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
1. E-learning for teachers	86	45.74	57	41.3	29	58.0
2. E-learning for courseware designers	99	52.66	77	55.8	22	44.0
3. E-learning for project managers	75	39.89	57	41.3	18	36.0
4. Create a Web Page with Microsoft Word	21	11.17	13	9.4	8	16.0
5. Create an E-Book from Web	26	13.83	18	13.0	8	16.0
6. Create an E-learning Course with eXe	22	11.70	19	13.8	3	6.0
7. Movie Editing	6	3.19	6	4.3	0	-
8. Others	4	2.13	3	2.2	1	2.0

Table 10 presents the course grades, which were collected from instructors at the end of the term period. For the unsuccessful group, the lowest grade point was 28, while the highest grade point was 69 (Mean = 50.48). In the successful group, the minimum grade point was 70, while the maximum grade point was 99 (Mean = 92.53).

Table 10

Descriptive Statistics for Online Learners' Course Grades

Completion groups	N	Minimum	Maximum	Mean	SD
Unsuccessful Group	50	28	69	50.48	11.05
Successful Group	138	70	99	92.53	5.47

Quantitative Research Results

Descriptions of the Measures and Reliability

In the present study, standard procedures such as Cronbach's alpha and factor analysis were conducted to estimate reliability and validity.

The Modified MSLQ, which was modified by Artino and McCoach (2008), was used to measure self-regulated learning in the study by Wang (2010). There are two major domains, which are motivation and learning strategy. The motivation domain consists of 3 SRL subscales (task value, self-efficacy, and test anxiety), while the learning strategy domain consists of 4 SRL subscales (elaboration, critical thinking, metacognitive self-regulation, and time/study environmental management). In Wang's study, the internal consistency using Cronbach's alpha for the motivation subscales was 0.90, 0.93, and 0.80, respectively, while the reliability estimates for the learning strategies subscales were 0.75, 0.80, 0.79, and 0.76, respectively. These figures support the assertion that the Modified MSLQ is suitable for the measurement of SRL in online learning environments (Wang, 2008).

Confirmatory Factor Analysis

Based on the theoretical model of Artino and McCoach (2008) and Wang (2010), a confirmatory factor analysis (CFA) using a principal component extraction method, a varimax rotation of a 19-item Motivation domain, and a 31-item Learning Strategy domain were administered to the participants at the Thailand Cyber University Project ($N = 188$) in the current study. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.622 for the Motivation scale and 0.914 for the Learning Strategy scale, indicating that the present data were appropriate for principal

components analysis (high values between 0.5 and 1.0 indicate factor analysis is appropriate). In addition, Bartlett's test of sphericity, which is used to test the null hypothesis that the variables are uncorrelated in the population, was statistically significant for both scales ($p < 0.001$), indicating sufficient correlation between the variables to proceed with the analysis.

Motivation Subscales

Using the Kaiser-Guttman retention criterion of eigenvalues greater than 1.0 and with the criteria fixed at 3 factors, the three factors were extracted with Varimax rotation, and Components 1, 2, and 3 accounted for 57.02% of the total variance. The results and the analysis can be viewed in Table 11.

Table 11

Rotated Component Matrix: Factorial Analysis by Forcing into 3 Factors (19 items, N = 188)

	Component		
	1	2	3
10, 12	.907		
10, 19	.839		
10, 1	.777		
10, 18	.744		
10, 13	.700		.283
10, 9	.580	.224	-.311
10, 4	.502		
10, 7	.470	.347	-.413
10, 15		.813	
10, 16		.810	
10, 10		.763	
10, 14		.725	
10, 6		.683	
10, 2	.219	.521	
10, 11			.815
10, 5			.792
10, 17			.757
10, 8	.225		.689
10, 3			.607

All items fell into the same structures as in the previous research (see Table 4). Communities were fairly high for each of the 19 items, with a range of 0.568 to 0.872. The first factor (self-efficacy) was composed of 8 items and accounted for 22.13% of the variance. The second factor (task value) consisted of 6 items and accounted for 18.27% of the variance. The last factor (test anxiety) had 5 items and accounted for 16.62% of the variance. The corrected item-total correlation and internal consistency Cronbach's alpha for each subscale are shown in Table 12.

Table 12

Item-Total Correlation and Reliability Statistics for Motivation Subscales

Subscales	Item #	Range of corrected item-total correlation	Cronbach's alpha
- Self-Efficacy	1, 4, 7, 9, 12, 13, 18, 19	0.459 - 0.784	.860
- Task Value	2, 6, 10, 14, 15, 16	0.488 – 0.708	.822
- Test Anxiety	3, 5, 8, 11, 17	0.507 – 0.679	.808

Learning Strategies Subscales

Similarly to the motivation subscales, using the Kaiser-Guttman retention criterion of eigenvalues greater than 1.0 and a criterion fixed at four factors, the four factors accounted for 68.40% of the total variance. Most of the items fell into the same structure as was indicated in the prior studies. Communities were fairly high for each of the 31 items, with a range of 0.486 to 0.893. However, four items were removed during the process of making subscales for the following reasons: Item 1, “When I’m online for this class I often miss important points because I’m thinking of other things,” and Item 29, “If I get confused during online activities, I make sure I sort it out afterwards,” decreased the reliability in the subscale. Item 15, “I often find that I have been reading

for this class but don't know what it was all about," and Item 19, "I have a regular place set aside for studying," were loading across more than one factor. A total of 27 items were used in the process of making subscales for Learning Strategies domain. The results are shown in Table 13.

Table 13

Rotated Component Matrix: Factorial Analysis by Forcing into 4 Factors (31 items, N = 188)

	Component			
	1	2	3	4
11, 14	.864			
11, 9	.863			
11, 3	.838			
11, 7	.835			
11, 13	.834			.282
11, 12	.831			
11, 27	.604		.297	
11, 21	.542	.260	.530	.324
11, 16	.535		.436	.468
11, 29	.478			
11, 22		.834		
11, 25		.828		
11, 26		.796	.384	
11, 17		.787		
11, 11		.745		
11, 5	.376	.661		
11, 18	.362	.548		.256
11, 19	.391	.432	.428	
11, 30r			.825	
11, 28r			.726	
11, 10r			.695	
11, 23		.267	.588	.313
11, 6	.446		.566	.382
11, 2	.497		.521	.272
11, 15r		.469	.516	.421
11, 31			.515	.443
11, 24	.553		.271	.692
11, 4	.514			.688
11, 8	.569		.279	.671
11, 1r				.654
11, 20	.521			.619

The first factor (metacognitive self-regulation) was composed of 9 items and accounted for 46.35% of the variance. The second factor (elaboration) consisted of 7 items and accounted for 9.82% of the variance. The third factor (time/study environmental management) consisted of 7 items and accounted for 7.70% of the variance. The last factor (critical thinking) had 4 items and accounted for 4.54% of the variance. The corrected item-total correlation and internal consistency Cronbach's alpha for each subscale are shown in Table 14.

Table 14

Item-Total Correlation and Reliability Statistics for Motivation Subscales

Subscales	Item #	Range of corrected item-total correlation	Cronbach's alpha
- Metacognitive Self-Regulation	3, 5, 7, 9, 12, 13, 14, 23, 27	0.648 – 0.909	.954
- Elaboration	4, 8, 16, 20, 21, 22, 24	0.539 – 0.807	.894
- Time/Study Envntl. Management	2, 6, 10r, 25, 28r, 30r, 31	0.481 – 0.755	.885
- Critical Thinking	11, 17, 18, 26	0.790 – 0.904	.954

The average score and reliability information for each scale and subscale based on the sample collected from TCU's online learners during January 2012 and June 2012 are presented in Table 15. The average score of each scale and subscale was higher than the midpoint (4) of the corresponding scale, except in the subscale on test anxiety, which showed the lowest mean score at 3.27. The highest mean score was 6.61 on task value. The average mean scores for self-efficacy, elaboration, metacognitive self-regulation, critical thinking, and time/study environmental management were 5.53, 5.07, 4.77, 4.56, and 4.39 respectively. The Cronbach's alpha values for 2 scales (motivation,

$\alpha = .813$, and learning strategy, $\alpha = .959$) and all 7 subscales were larger than 0.80, presenting consistent reliability on each scale and subscale.

Table 15

Average Score and Reliability Statistics for Each Scale and Subscales

Subscales	Number of Items	Mean	Std. Deviation	Cronbach's alpha
Motivation	19	5.47	0.614	.813
- Self-Efficacy	8	5.53	0.71	.860
- Task Value	6	6.16	0.60	.822
- Test Anxiety	5	3.27	1.33	.808
Learning Strategies	27	4.70	1.169	.959
- Metacognitive	9	4.77	1.49	.954
Self-Regulation				
- Critical Thinking	4	4.56	1.18	.894
- Time/Study Env'tl	7	4.39	1.29	.885
Management				
- Elaboration	7	5.07	1.61	.954

Correlation Analysis

To assess the overall associations among independent variables (the SRL characteristics of Thai online learners), bivariate correlation analysis was run with the 188 respondents based on correlations among the independent variables (all 7 SRL characteristics, self-efficacy, task value, test anxiety, metacognitive self-regulation, critical thinking, time/study environmental management, and elaboration). All 7 independent variables from the 2 SRL domains were drawn into the examination of inter-factor correlations. Correlations ranged from 0.175 to 0.348 for the motivation factors and from 0.422 to 0.756 for the learning strategy factors (see Table 16).

Table 16

Correlations Among Independent Variables

	Self Effic	Task Value	Test Anxiety	MetaSR	Critic Think	TimeStudy Mgt	Elaboration
SelfEffic	–	.348**	-.175*	.141	.074	.143	.015
TaskValue		–	-.072	.018	.023	.046	.057
TestAnxie			–	.011	.024	.012	.047
MetaSR				–	.501**	.700**	.756**
CriticThink					–	.422**	.429**
TimeStudyMgt						–	.702**
Elaboration							–

* $p < .05$. ** $p < .01$

According to Table 16, there are considerably small correlations on the motivation factors and large correlations on the learning strategies factors. In the motivation domain, self-efficacy was significantly correlated with task value and test anxiety at lower levels ($r = .348$, $p < .01$ and $r = -.175$, $p < .05$), indicating that task value and test anxiety are influenced by self-efficacy; learners with high self-efficacy tend to be more task value oriented and to have less test anxiety. In the learning strategies domain, all four SRL characteristics were correlated with each other at the .01 of significance level ($p < .01$), indicating that metacognitive self-regulation, critical thinking, time/study environmental management, and elaboration are influenced by each other; learners who have a high level on one learner strategy characteristic tend to have a high level in others. However, the results displayed that there were no relationships across the SRL domains, implying that SRL characteristics in the motivation domain and the learning strategies domain were not related to each other.

In addition to the correlation above, Independent Sample *t*-tests were conducted to examine mean differences in the SRL characteristics between unsuccessful vs. successful online learners, the results of which revealed a significant difference in the SRL characteristics by course completion differences (see Table 17).

Table 17

Independent Sample t-test of Means Differences in the SRL Characteristics

	Unsuccessful (N = 50)		Successful (N = 138)		<i>t</i>	<i>p</i>	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.39	0.79	5.58	0.68	-1.654	.100	-.194
TaskValue	6.19	0.66	6.15	0.58	.406	.686	.041
TestAnxie	3.12	1.22	3.33	1.37	-.949	.344	-.209
MetaSR	2.75	0.40	5.50	0.98	-27.346	.000**	-2.751
CriticThink	3.53	1.27	4.93	0.89	-7.209	.000**	-1.405
TimeStudyMgt	2.55	0.66	5.06	0.67	-22.888	.000**	-2.516
Elaboration	3.03	1.32	5.81	0.92	-13.706	.000**	-2.776

***p* < .001.

According to Table 17, an independent sample *t*-test indicated that there were significant differences between successful (*N* = 138) and unsuccessful (*N* = 50) groups in four characteristics of the Learning Strategy domain. Successful online learners had a higher level of metacognitive self-regulation ($t(183.66) = 27.35, p < .0001$), critical thinking ($t(67.28) = 7.21, p < .0001$), time/study environmental management ($t(88.15) = 23.07, p < .0001$), and elaboration ($t(67.05) = 13.71, p < .0001$). Cohen's effect size values, MetaSR ($d = 3.67$), CriticThink ($d = 1.28$), TimeStudyMgt ($d = 3.77$), and Elaborate ($d = 2.44$), suggested a large effect size. However, there were no statistically significant differences in any of the 3 characteristics of the Motivation domain.

Regression Analysis

To determine the predictive power of the SRL characteristics for academic achievement, Multiple Regression analyses were conducted. In the multiple regression models, the course grade was set as the dependent variable, and each of the 7 SRL characteristics were considered the independent variables. These variables in the current study were used in the multiple regression procedures to build a regression equation in the form:

$$Y = b_0 + b_1 \cdot X_1 + b_2 \cdot X_2 + b_3 \cdot X_3 + b_4 \cdot X_4 + b_5 \cdot X_5 + b_6 \cdot X_6 + b_7 \cdot X_7$$

$$\text{Course grades} = b_0 + b_1 \cdot \text{SE} + b_2 \cdot \text{TV} + b_3 \cdot \text{TA} + b_4 \cdot \text{MS} + b_5 \cdot \text{CT} + b_6 \cdot \text{TM} + b_7 \cdot \text{EL}$$

where b_0 is a constant value, $b_1 \dots b_7$ referred to regression coefficients, SE is self-efficacy, TV is task value, TA is test anxiety, MS is metacognitive self-regulation, CT is critical thinking, TM is time/study environmental management, and EL is elaboration.

The regression diagnosis was also performed in terms of regression assumptions, outliers, and multicollinearity, to make sure the dataset was ready for the further regression analyses.

Regression: Testing Assumptions

Linearity, normality, homoscedasticity, and multicollinearity are crucial assumptions that need to be met before performing a multiple regression analysis. If any of these assumptions is violated, multiple regression analysis cannot be used because the forecasts and confidence intervals may be inefficient, seriously biased, or misleading. In order to examine these assumptions, an exploratory analysis of regression in the SPSS program was performed with all 7 SRL variables.

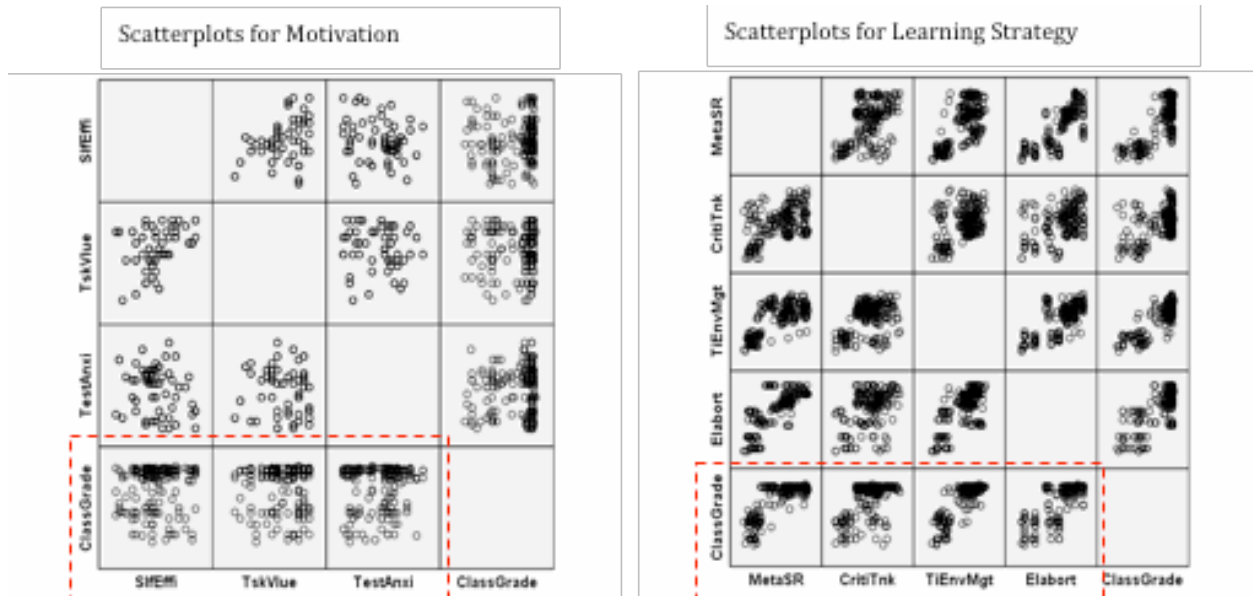


Figure 6. Scatter plots of predicted variables of motivation and learning strategy.

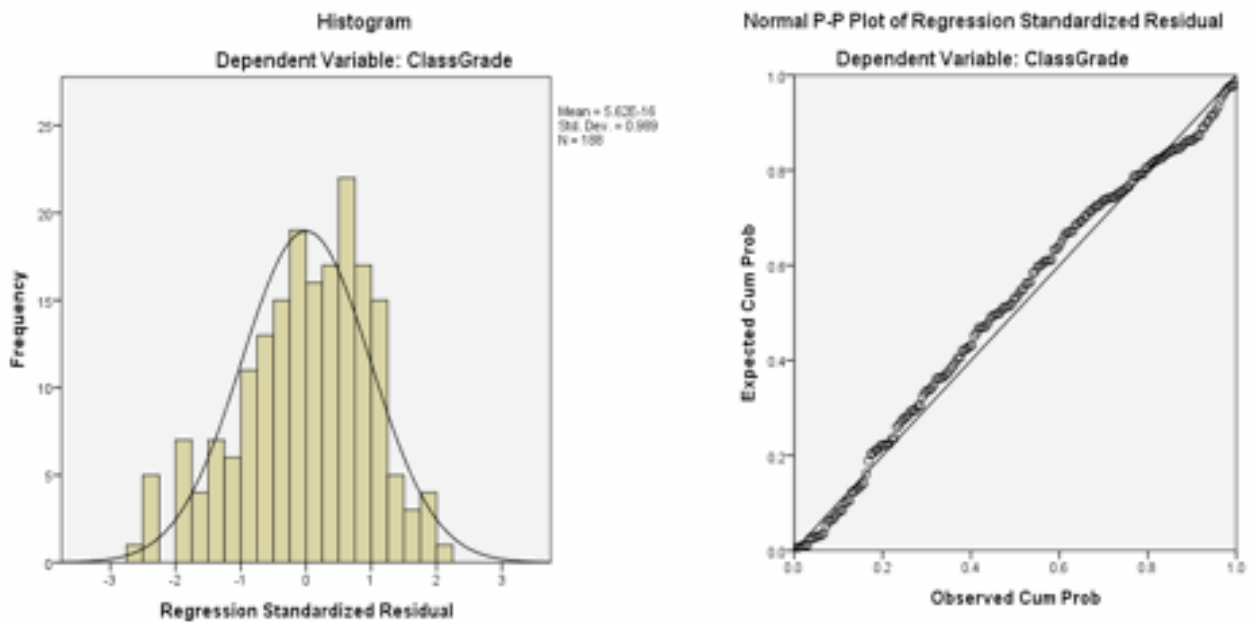


Figure 7. The distribution of dependent variables and the normal plot of residual.

The assumption of linearity was tested by looking at the matrix scatterplots of residuals versus predicted values between each independent variable and the dependent variable. Figure 5 below shows that course grade appears to be linearly related to each of the predictor variables with no visible potential outliers or influential observations; thus, the linearity assumption appears to be confirmed.

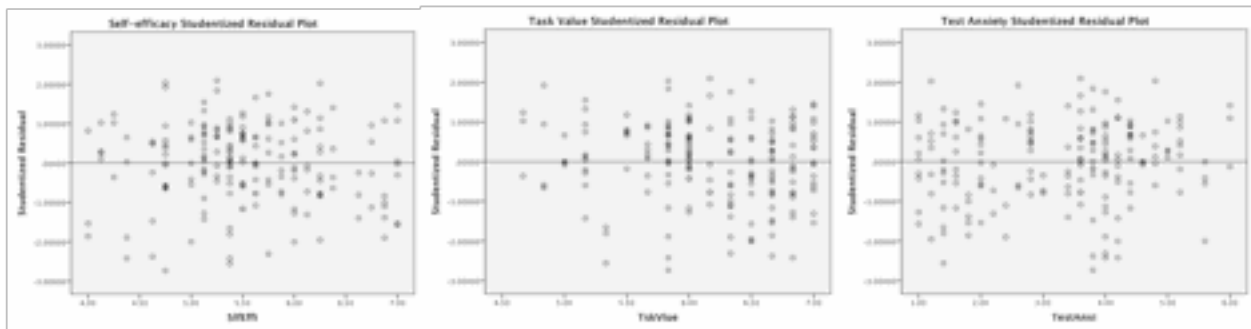
Regression assumes that variables have normal distributions. In the current study, the assumption of normality was examined by means of the P-P plot of regression standardized residuals and the histogram of dependent variables. Figure 6 presents the distribution of the dependent variable standardized residual (mean = 5.62; $SD = 0.989$; skewness = $-.652$; kurtosis = $-.696$); there were no outliers. The normal plot of the residual shows the points close to a diagonal line; thus, the normality assumption is met.

Homoscedasticity violations result in confidence intervals that are too wide or too narrow. In some cases, heteroscedasticity may have the effect of giving too much weight to a small subset of the data when coefficients are estimated. The plot of residuals versus the independent variables shows evidence of an error variance. In Figure 7, each of the standardized residual plots shows a random scatter of points with constant variability; therefore, the assumption of homoscedasticity in the present study is confirmed.

The last assumption tested for by means of multiple regression is multicollinearity. Multicollinearity occurs when one of the independent variables has a substantial linear relationship with another independent variable in the equation. Multicollinearity will result in a biased and inefficient estimator. To examine this assumption, a calculation of all

possible bivariate combinations of the Pearson correlation coefficient among the independent variables was performed. Generally, a high correlation coefficient (0.80 or greater) suggests a problem. As shown in Table 15, there was no signal of multicollinearity since the correlations for each pair of independent variables were smaller than 0.80, which indicated that there were no potential multicollinearity problems.

Motivation SRL



Learning Strategy SRL

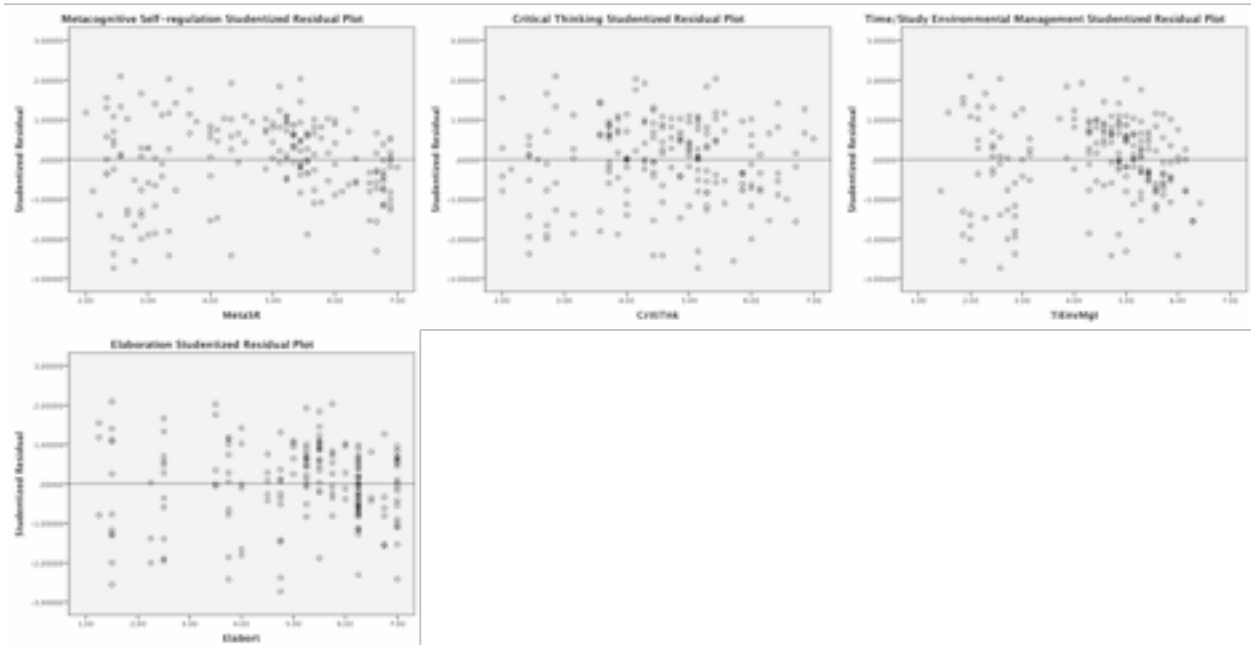


Figure 8. Scatter plots of residuals versus predicated value.

Multiple Regression Results

To answer Research Question 2, multiple linear regressions were performed to investigate the relationships between the seven SRL characteristics and academic course grades. Table 18 reveals the coefficient of multiple determination at 0.113 ($R^2 = .113$, $F(7,137) = 2.371$, $p < .05$); therefore, about 11.3% of the variation in the academic achievement of successful online learners is explained by some of the SRL characteristics for the higher course grade. The regression equation appears to be useful for making predictions.

Research Question 2: What is the relationship between SRL characteristics and academic achievement in Thai online learning environments?

Hypothesis 2: Among successful online learners, those who have higher levels of SRL will have higher course grades.

$$H_0 : \beta_i = \beta_i = 0$$

$$H_1 : \text{at least one } \beta_i \neq 0$$

Table 18

Model Summary of Multiple Linear Regression Model Results

Model Summary*					
Model		<i>R</i>	<i>R</i> Square	Adjusted <i>R</i> Square	Std. Error of the Estimate
1	Successful learners	.336	.113	.065	5.28875

* Dependent Variable: Course Grade

Predictors: (Constant), Elabort, TiEnvMgt, TestAnxi, CritiTnk, SifEffi, TskVlue, MetaSR

In the multiple regression models, course grade was set as the dependent variable, while the seven characteristics of SRL were considered the independent variables. As shown in Table 19, the result of multiple regression analysis returned a significance value of .026 ($F = 2.371, p < .05$). Since this value is less than the comparative significance standard of .05 ($p\text{-value} = 0.026, \leq 0.05$), the null hypothesis was rejected. At the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that at least one of the predictors is useful for predicting course grades.

Table 19

Summarization of Multiple Linear Regression Model Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	464.164	7	66.309	2.371	.026*
	Residual	3636.220	130	27.971		
	Total	4100.384	137			

* Predictors: (Constant), TiEnvMgt, Elabort, TestAnxi, CritiTnk, SifEffi, TskVlue, MetaSR

During the regression analysis phase of the current study, time/study environmental management and critical thinking were the only 2 of the 7 factors that returned significance values of .012 ($t = 2.563, p < 0.05$) and .048 ($t = 1.993, p < 0.05$) respectively. These findings suggest there are significant positive relationships between time/study environmental management and academic course grade ($\beta = 1.863, p < .05$), and between critical thinking and academic course grade ($\beta = 1.044, p < .05$) in successful online learners (see Table 20). The other 5 SRL characteristics reported significance values greater than .05 ($p\text{-value} > 0.05$) as shown in Table 20. Self-efficacy returned a significance value of .321 ($t = .996, p > 0.05$), task value returned a significance value of .273 ($t = -1.100, p > 0.05$), test anxiety returned a significance

value of .286 ($t = -1.071, p > 0.05$), metacognitive self-regulation returned a significance value of .386 ($t = .870, p > 0.05$), and elaboration returned a significance value of .770 ($t = .293, p > 0.05$). The findings of this analysis indicate that a significant relationship between self-efficacy and academic course grade, task value and academic course grade, test anxiety and academic course grade, metacognitive self-regulation and academic course grade, or elaboration and academic course grade does not exist.

Table 20

Results of Multiple Linear Regression Comparing Seven SRL Characteristics Associated with Academic Course Grade

		Coefficients*				
Model		Unstandardized		Standardized	<i>t</i>	Sig.
		Coefficients		Coefficients		
		B	Std. Error	β		
1	(Constant)	77.373	6.770		11.428	.000
Successful learners	SlfEffi	.751	.754	.093	.996	.321
	TskVlue	-.972	.883	-.104	-1.100	.273
	TestAnxi	-.362	.339	-.091	-1.071	.286
	MetaSR	.470	.540	.084	.870	.386
	CritiTnk	1.044	.524	.170	1.993	.048
	TiEnvMgt	1.863	.727	.228	2.563	.012
	Elabort	.168	.575	.028	.293	.770

* Dependent Variable: CourseGrade **Selecting only case for which Two Groups = Successful

Significance values that are less than .05 indicate that the corresponding self-regulated learning characteristics have a significant, positive relationship with academic achievement. Thus, the corresponding SRL characteristics contribute to predicting academic course grade in successful online learners. Since there are two predictors that returned significant values less than .05, critical thinking ($B = 1.044, p < .05$), time/study environmental management ($B = 1.863, p < .05$), and a constant ($B = 77.373,$

$p < .0001$) are used to predict the academic course grade of successful online learners. From the above output, the constant value of 77.373 was added to each predictor in the formula to find out how successful the successful online learners would be in Thai online learning environments. Thus, the regression equation is built in the form:

$$\text{Course Grades} = 77.373 + 1.044*(\text{critical thinking level}) + 1.863*(\text{time/study environmental management level})$$

This means, for instance, that two online learners who differed by one point on critical thinking would be predicted to differ by 1.044 points in the course grade; also, two learners differing by one point on time/study environment management would be predicted to differ by 1.863 points in the course grade.

In summary, the results of multiple regression indicated that two out of seven independent variables explained 11.3% of the variance ($R^2 = .113$, $F(7,137) = 2.371$, $p < .05$). Time/study environmental management ($\beta = .288$, $p < .05$) and critical thinking ($\beta = .170$, $p < .05$) significantly predicted academic course grades of successful online learners. The effect size was small.

Comparison of Means

Another focus of the current study was to investigate the level of SRL characteristics differences among online learners in different demographic subgroups. The independent sample *t-tests* and the general linear model (GLM) were performed to compare group means in each demographic subgroup. The 7 different SRL characteristics were used as dependent variables. The mean difference between 6 demographic subgroups (gender, age range, educational level, marital status, Internet

experience, and online course experience) was determined.

Table 21

Independent Sample t-test of Gender-Related Differences in the SRL Characteristics

	Male (N = 98)		Female (N = 90)		<i>t</i>	<i>p</i>	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.59	0.69	5.45	0.74	1.349	.179	.140
TaskValue	6.04	0.56	6.28	0.63	-2.800	.006*	-.243
TestAnxie	3.22	1.39	3.32	1.27	-.545	.587	-.106
MetaSR	4.78	1.51	4.76	1.48	.111	.912	.024
CriticThink	4.52	1.17	4.61	1.19	-.550	.583	-.095
TimeStudyMgt	4.34	1.27	4.46	1.33	-.634	.527	-.120
Elaboration	5.06	1.63	5.07	1.60	-.036	.971	-.009

**p* < .05

To compare gender differences in SRL characteristics, an independent sample *t*-test was conducted. The results of these analyses showed a significant difference in SRL characteristics by gender (see Table 21). Among the gender differences, there was a significant difference between male and female online learners in only 1 SRL characteristic, which is task value ($t(186) = -2.80, p < .05$), Cohen's *d* ($d = .40$); females displayed a significantly higher level on task value than male online learners. Though the differences in the other SRL characteristics did not reach statistical significance, an independent sample *t*-test revealed that female online learners did report higher levels of test anxiety ($d = .07$), critical thinking ($d = .07$), and time/study environmental management ($d = .09$) than did male online learners. Men, on the other hand, reported higher levels of SRL characteristics in self-efficacy ($d = .20$) than female. There were no significant differences in metacognitive self-regulation or elaboration characteristics.

For the age range subgroups, a General Linear Model (GLM) was performed to examine the effects of 3 factors of age range on the 7 SRL characteristics.

Table 22

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected	SelfEffic	2.362 ^a	2	1.181	2.354	.098
	TaskValue	.012 ^b	2	.006	.016	.984
	TestAnxie	44.210 ^c	2	22.105	14.236	.000
	MetaSR	4.356 ^d	2	2.178	.976	.379
	CriticThink	1.786 ^e	2	.893	.639	.529
	TimeStudyMgt	2.461 ^f	2	1.231	.729	.484
	Elaboration	1.717 ^g	2	.858	.329	.720
Intercept	SelfEffic	5595.306	1	5595.306	11154.980	.000
	TaskValue	6898.665	1	6898.665	18707.782	.000
	TestAnxie	1872.073	1	1872.073	1205.683	.000
	MetaSR	4180.210	1	4180.210	1873.981	.000
	CriticThink	3799.736	1	3799.736	2719.821	.000
	TimeStudyMgt	3535.534	1	3535.534	2093.290	.000
	Elaboration	4683.430	1	4683.430	1794.396	.000
Age_3groups	SelfEffic	2.362	2	1.181	2.354	.098
	TaskValue	.012	2	.006	.016	.984
	TestAnxie	44.210	2	22.105	14.236	.000
	MetaSR	4.356	2	2.178	.976	.379
	CriticThink	1.786	2	.893	.639	.529
	TimeStudyMgt	2.461	2	1.231	.729	.484
	Elaboration	1.717	2	.858	.329	.720

a. R Squared = .025 (Adjusted R Squared = .014)_a

b. R Squared = .000 (Adjusted R Squared = -.011)_b

c. R Squared = .133 (Adjusted R Squared = .124)_c

d. R Squared = .010 (Adjusted R Squared = .000)_d

e. R Squared = .007 (Adjusted R Squared = -.004)_e

f. R Squared = .008 (Adjusted R Squared = -.003)_f

g. R Squared = .004 (Adjusted R Squared = -.007)_g

h. Computed using alpha = .05

As shown in Table 22, there is no significant difference within the age range subgroups in self-efficacy, task value, metacognitive self-regulation, critical thinking, time/study environmental management, or elaboration. The only significant difference within the age range subgroups was found on the test anxiety characteristic ($F(2,186) = 14.236, p < .0001, R^2 = .133$). Online learners who were 31-40 years old ($M = 3.19$) had a lower level of test anxiety than those who were 21-30 years old ($M = 3.19$), but higher

than those who were 41-50 years old ($M = 3.19$); ($21-30t_{setaxi} > 31-40t_{setaxi} > 41-50t_{setaxi}$). In other words, younger learners tended to have more test anxiety than those who were older.

Among the marital status differences, 2 out of 7 of the SRL characteristics showed statistically significant differences. Both self-efficacy level ($t(186) = -5.53, p < .001$) and task value level ($t(186) = -3.19, p < .05$) of married online learners were higher than for single online learners (see Table 23). That is, online learners who were married had, on average, a higher level of self-efficacy and task value than those who were single. Further, Cohen's effect size value reported a large effect size on self-efficacy ($d = .94$) and a medium effect size on task value ($d = .49$).

Table 23

Independent Sample t-test of Marital Status-Related Differences in the SRL Characteristics

	Single ($N = 85$)		Married ($N = 89$)		t	p	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.30	.62	5.84	.52	-5.533	.000**	-.540
TaskValue	6.03	.62	6.31	.69	-3.194	.002*	-.276
TestAnxie	3.35	1.20	3.14	1.48	1.034	.302	.211
MetaSR	4.83	1.45	4.81	1.53	.099	.921	.226
CriticThink	4.62	1.06	4.52	1.26	.557	.578	.099
TimeStudyMgt	4.40	1.25	4.47	1.31	-.353	.725	-.069
Elaboration	5.14	1.53	5.10	1.63	.190	.849	.046

* $p < .05$, ** $p < .001$

In the educational level subgroups, the differences in SRL characteristics did not reach statistical significance in any of the 7 SRL characteristics. In this case, the null hypothesis was not rejected. Undergraduate online learners and graduate online

learners showed no difference in self-regulated learning motivation or learning strategy when studying in online learning environments. Statistical significance findings are presented in Table 24.

Table 24

Independent Sample t-test of Educational Level-Related Differences in the SRL Characteristics

	Undergraduate (N = 40)		Graduate (N = 148)		t	p	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.42	.73	5.56	.71	-1.053	.294	-.134
TaskValue	6.04	.82	6.19	.53	-1.073	.288	-.146
TestAnxie	3.48	1.14	3.21	1.38	1.130	.260	.268
MetaSR	4.53	1.45	4.84	1.50	-1.134	.258	-.302
CriticThink	4.54	1.21	4.57	1.18	-.147	.884	-.031
TimeStudyMgt	4.13	1.39	4.46	1.27	-1.456	.147	-.336
Elaboration	5.02	1.63	5.08	1.61	-.217	.829	-.062

*p < .05

A similar pattern of minimal differences was also found in the online course experience subgroups. The differences did not reach statistical significance, so Hypothesis 3, Among online learners, the levels of SRL characteristics will be different among demographic groups, was not confirmed for the online course experience subgroups.

In Table 25, the results show that there were no statistically significant differences in the 7 SRL characteristics between online learners who had no experience in online learning courses and those who had some.

Table 25

Independent Sample t-test of Online Course Experience-Related Differences in the SRL Characteristics

	None (N = 84)		Some (N = 104)		t	p	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.46	.77	5.58	.66	-1.140	.256	-.119
TaskValue	6.19	.63	6.13	.58	.718	.474	.064
TestAnxie	3.36	1.13	3.19	1.47	.904	.367	.172
MetaSR	4.80	1.60	4.75	1.41	.243	.808	.054
CriticThink	4.59	1.28	4.54	1.10	.261	.795	.045
TimeStudyMgt	4.32	1.35	4.45	1.26	-.693	.489	-.132
ElaboratiobsOn	5.10	1.64	5.05	1.60	.209	.834	.050

*p < .05

The last concern about demographic subgroups in the current study is the Internet use experience of online learners before taking the current online learning course.

Table 26

Independent Sample t-test of Internet Experience-Related Differences in the SRL Characteristics

	Less than 6 yrs. (N = 32)		More than 6 yrs. (N = 156)		t	p	Mean Difference
	Mean	SD	Mean	SD			
SelfEffic	5.28	.64	5.58	.72	-2.198	.029*	-.301
TaskValue	6.06	.73	6.18	.58	-.831	.411	-.114
TestAnxie	3.23	1.21	3.29	1.36	-.205	.837	-.053
MetaSR	4.29	1.58	4.87	1.46	-2.008	.046*	-.577
CriticThink	4.40	1.34	4.59	1.15	-.832	.406	-.191
TimeStudyMgt	3.81	1.42	4.51	1.24	-2.590	.013*	-.699
Elaboration	4.63	1.82	5.16	1.56	-1.686	.093	-.524

*p < .05

The results from the independent sample *t-test* (see Table 26) revealed that

there are some significant differences in SRL characteristics between online learners who had less experience of using Internet and those who had more than 6 years' experience using the Internet. self-efficacy ($t(186) = -2.20, p < .05$), metacognitive self-regulation ($t(186) = -2.01, p < .05$), and time/study environmental management ($t(186) = -2.59, p < .05$) were reportedly higher in the subgroup of online learners with more than 6 years of Internet use than in the subgroup of online learners with less than 6 years of Internet use. Cohen's effect sizes ($d = .32$) on self-efficacy and ($d = .30$) on metacognitive self-regulation suggested low practical significance, while the effect size ($d = .81$) on time/study environmental management suggested a high practical significance. Interestingly, even though the difference in elaboration characteristic (Mean = 5.16, 4.63) did not reach statistical significance, Cohen's effect size ($d = .31$) suggested a low practical significance. Also, although task value (Mean = 6.18, 6.06), test anxiety (Mean = 3.29, 3.23), and critical thinking (Mean = 4.59, 4.40) did not reach statistical significance, the results revealed that online learners who had more Internet experience did report higher levels of SRL than those who had less experience.

Qualitative Research Results

Description of the Measures

The qualitative data were collected taking into consideration the quantitative results in order to provide a deeper understanding about individual experiences of the successful online learners. Semi-structured interviews were conducted after the quantitative data from the modified MSLQ online survey had been analyzed, and a purposive sampling technique was used. Participants were interviewed one time, and the interviews lasted from 15-20 minutes. At the beginning of the interview, the researcher reminded the participants of the survey which they had taken beforehand and stated that the interview was a follow-up as a result of the quantitative method research. Participants were asked to sign a form acknowledging their consent to be interviewed and were informed that they could leave at any time. The interviews were recorded using Garage Band, an application, on a 2010 MacBook Pro laptop. In total, seven successful online learners were asked to participate in the semi-structured interviews at the end of the course period. The first 4 participants were interviewed as a group because they arrived together and worked in the same place. The other 3 were interviewed individually because they came in at different times and were from different places. To insure the confidentiality of the participants, pseudonyms were used to refer to the interview answers from each subject.

Given the quantitative results, only SRL characteristics in the learning strategy domain were used to create the questions in the semi-structured interviews, the reason being that the multiple regression results indicated that only the learning strategy domain significantly predicted a student's academic course grade.

The interview questions included:

1. What strategies have you used in order to keep track of tasks, activities, or assignments through online learning?
2. How often did you go online to check your course assignments?
3. What strategy did you use to help yourself remember the lessons in the online learning course?
4. How did you review the content before taking an exam?
5. What did you do when you didn't understand how to do the assignments?
6. What kinds of online tools did you most often use when you studied online?
7. How did you communicate with your online classmates, or with your instructor?

All seven interview questions were translated into Thai and used in the Thai version. The answers to these questions were transcribed and back-translated into English by the researcher and peer translator; an English teacher at Thai university. The digital audio recording was compared to the text for accuracy at the end of the transcription process before the translating was done. The English versions of the transcriptions were transferred into the Nvivo 9 program, a qualitative and mixed methods software analysis tool, in order to facilitate the process of open-coding and discourse analysis. An analysis of these data followed the guidelines of qualitative content analysis proposed by Chi (1977). It began with a search for patterns within the data from each of the participants, and then proceeded to search for patterns across all participants. The steps of this analysis included the following:

1. The answers to the interview questions were descriptively coded to create nodes and attributes by means of importing the transcripts of interview from Word document into Nvivo 9 program. Then, auto coding the transcripts to nodes and at headings to interview themes.

2. The answers to the interview questions were coded into high level categories created as tree nodes such as “metacognitive self-regulation,” “critical thinking,” “time/study environmental management,” “elaboration,” etc.

3. Some interesting issues and themes such as “online tools” and “social network” were identified after all topic nodes had been read through, and new nodes were created at that point.

4. Consideration of the coding at the broader tree nodes and the themes in the memos led to further refinement of the categories and reorganization of tree nodes based on the theoretical framework of Zimmerman’s cyclic phase model (Zimmerman & Campillo, 2002) and Pintrich’s conceptual framework for SRL (Pintrich & Zusho, 2002). The categories in the current study were metacognitive self-regulation, critical thinking, time/study environmental management, elaboration, and communication tools.

5. Exploration of the coded data using queries to identify relationships between nodes and to create charts for each pseudonym of the interviewees for each category of SRL learning strategies and online learning tools.

6. Supporting and disconfirming evidence in the transcripts were identified in order to allow triangulation of the results from the quantitative analysis.

During the process of coding, each interview’s answer was classified and ranged from a single word to an entire answer. The categorization continued until a different

code was used. Every interview answer was coded independently by the researcher and a peer coder, each of whom had examples and definitions of each SRL strategy category to compare to the exact words in the interview answer. About 20% of the total interview answers were discrepant between a first and second coding. The researcher and the peer coder analyzed and resolved every discrepancy through further reading of the transcripts and discussion. In the analysis of the qualitative data, a number of references (derived from NVivo 9 qualitative analysis software) were used to represent the SRL learning strategies reported by the interview participants.

This section contains the basic information derived from the responses and the selected qualitative results from an analysis of the transcribed interview questions and answers. The final SRL learning strategy categories included 5 categories, and the frequency data are shown in Table 27.

Table 27

Frequency and Percent of SRL Learning Strategy Categories for Interview Questions

Categories of Strategies	Frequency	Percent
Metacognitive Self-Regulation	38	24.20
Critical Thinking	20	12.74
Time/Study Environmental Management	22	14.01
Elaboration	31	19.75
Online Learning Tools	46	29.30
	157	100

The online learning tool category had the highest number of references (29.30%) from all interview participants, while critical thinking was referred to least frequently, at 12.74 percent. Interestingly, metacognitive self-regulation, which did not show a

statistically significant predictive power in quantitative results ($\beta = .474, p > .05$), occurred with high frequency (24.20%) in the qualitative findings.

Table 28

Frequency Data of the Number of References in SRL Learning Strategies Categories

	Meta cognitive SR (%)	Critical Thinking (%)	Time/Study Envi. Mgmt. (%)	Elaboration (%)	Online Learning Tools. (%)
Interview 1 (Suchart, Samang, Noree, Mana)	24.35	14.55	13.92	17.19	25.13
Interview 2 (Peera)	13.78	23.78	4.11	17.47	18.58
Interview 3 (Kin)	20.85	10.20	8.58	12.99	30.60
Interview 4 (Poom)	5.98	20.89	15.19	9.45	10.25

Table 28 presents the frequency data on the number of references in each SRL category, and an overview of the categories of SRL learning strategies based on the analyses of the interviews with each interview participant is illustrated in Figure 9.

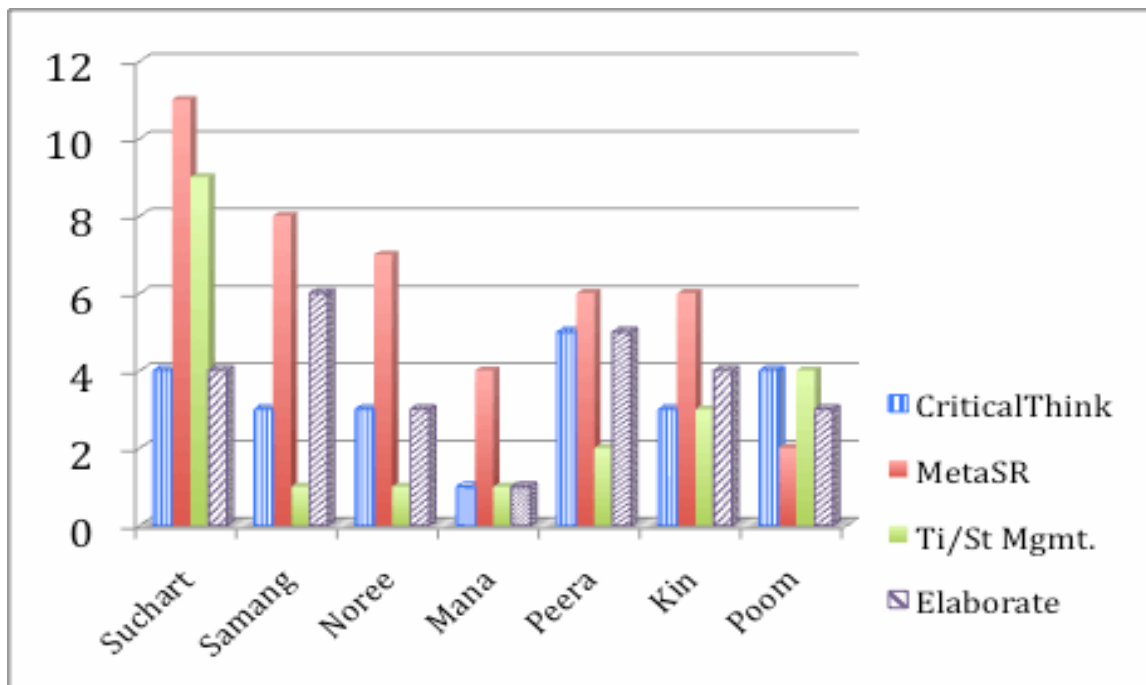


Figure 9. SRL learning strategies categories on each interview participant.

As shown in Figure 9, Suchart's responses showed the highest number of responses on almost every SRL category: 25% on metacognitive self-regulation, 16.7% on time/study environmental management, and 12.5% on both critical thinking and elaboration. On the opposite end of the spectrum, Mana's responses displayed the lowest number of responses on each SRL category: 30.8% on metacognitive self-regulation, and the even lower number of 7.7% on critical thinking, elaboration, and time/study environmental management. Overall, the interview participants responded extremely well to the metacognitive self-regulation category. Most of the participants' responses showed low levels on the time/study environmental management category. Figure 10 illustrates how the responses from each interview question were categorized into each SRL learning strategy category and subcategory.

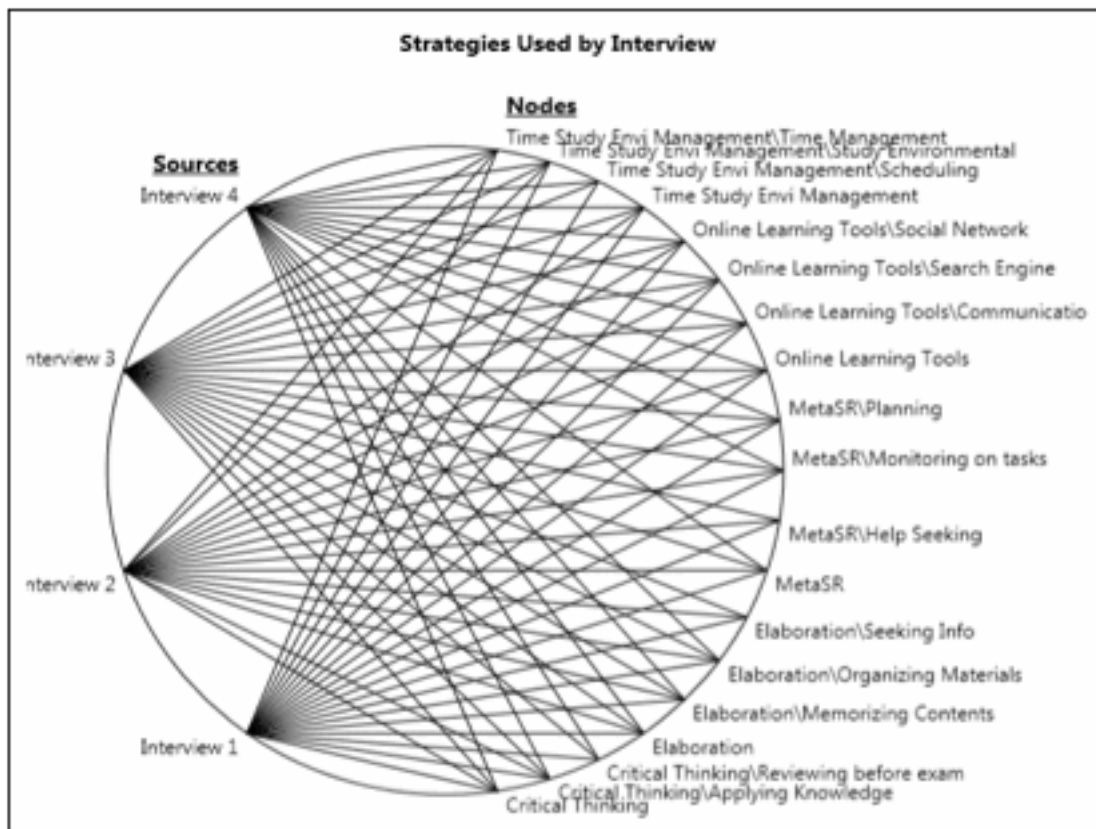


Figure 10. Categorization of interview responses.

As shown in Figure 10, all of the references recorded from the interview were categorized into subcategories of 4 SLR learning strategy categories and one online learning tools category. The references counted in each subcategory were tallied directly to the main categories and subcategories of the SRL learning strategy and online learning tools category.

Qualitative Findings

In the present study, some results from the quantitative analysis can be rationalized in terms of the qualitative interview answers, and there were similarities and differences in how participants reported the use of SRL strategies in online learning environments. All interview participants were successful online learners. Pseudonyms were used to protect the confidentiality of the participants. The descriptive characteristics of the interview participants are given below:

Suchart:

Suchart was an associate professor in a medical university in Bangkok. He was truly interested in E-learning, and he had been using the Internet for more than 6 years. Suchart attended TCU's online learning course in the E-learning for project managers program. Suchart's age was in the range of 51-60 years old, and he was the oldest participant in the interview.

Samang:

A female radiological technologist and faculty member of the department of medical technology, Samang was in the age range of 41-50 years old, and she was

single. Samang got a master's and a doctoral degree from Australia. She had more than 6 years' experience in using the Internet, and had previously taken more than 5 courses online. Samang attended TCU's E-learning for teachers program.

Noree:

Noree's age range was 31-40 years old, and she was married. Noree worked as an administrative coordinator in the same place as Suchart and Samang. She had less experience in Internet use, and she had no experience in online coursework. She also attended TCU's online course in the E-learning for teachers program, just as Samang.

Mana:

Mana was an assistant professor in the same department as Suchart and Samang. Mana had a doctoral degree in Communication and Information Science from Hawaii, USA. He was in the 31-40 years old age range. He joined TCU's E-learning for courseware designers program. He also had more than 6 years of Internet experience, and, like Samang, had previously taken more than 5 courses online.

Kin:

Kin, a single female, in the 41-50 years old age range, was a teacher at a large high school in Bangkok. She taught a basic computer course for high school students. Kin attended all three of TCU's E-learning programs at different time periods, and this was the third and last course for her in the courseware designers. She had more than 6 years of Internet experience and had previously taken more than 3 courses online.

Peera:

Peera was 21-30 years old, making her the youngest participant in the interview. She was single and studied as a part time graduate student in Educational Technology at a university in Bangkok. Peera joined TCU's E-learning for project managers program because she wanted to apply skills learned from the online course in her workplace. She worked in the field of HRD, training, and knowledge management (KM) at the big company in Bangkok.

Poom:

Poom was working in a Pilot E-learning program at Thai Airways Intl. Plc. Co., Ltd. He was in the 31-40 years old age range, and he lived with his wife and a baby son. Poom also was studying for his master's degree at a local university. He had more than 6 years of Internet experience, and he had previously taken more than 3 courses online. Poom attended TCU's online courses with 2 of his friends from the same organization and stated that the organization wanted to develop a Pilot E-learning program.

The following section presents the qualitative result evidence related with each of the SRL learning strategy categories, including the online learning tools category.

Metacognitive Self-Regulation

Metacognitive self-regulation refers to an individual's use of strategies such as planning, monitoring, and regulating to complete learning tasks. When asked what strategies they used to keep track of learning tasks, most respondents reported that they followed the course schedule to make a plan and monitor their learning tasks and

course assignments, while some respondents explained that they used more than one strategy to regulate themselves in order to be up to date with course activities. For example:

The Instructors posted all the schedules on Moodle or on instructors' web boards each week. I started checking them all on the first day.

I went online and checked the TCU Website to see if the instructor had posted any assignments or homework there. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

I mainly followed the class schedule because they already had a long-term schedule for us. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

The instructor always posted activities at the beginning of the week, and I just checked once a week. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

Some respondents explained in more detail; for example, Peera used a bookmark technique on her Internet browser, Kin made her own plan (but she still became lost at some points), and Mana used a planner on his smartphone:

I set my own planner on my cell phone to be matched with the course schedule. (Mana, an asst. prof., with more online experiences, e-Courseware designer)

Luckily, the TCU course has a certain schedule, so I could make a plan to go online, check assignments, post comments, and update myself. However, I still missed some points, forgot to do something, and turned in an assignment late. (Kin, a busy teacher in a huge high school, e-Courseware designer)

First of all, I've bookmarked the TCU's webpage on the first page of my Internet browser. That way, I can check any added activity on that website every day and every time that I go online. Second, this course has already posted the schedule, and I can see what will happen each week. (Peera, the youngest participant, working in the HRD field, e-Project manager)

Many participants said that they used a planning technique when they were getting ready to start the first week of their semester in order to keep up to date with course

assignments:

It was mostly one week for each assignment in each subject. Thus, the first two days were searching days. On the third day, we had to start writing. Otherwise it could not be done. If it was a group assignment, we would post onto "Google document." Group members would comment on the post so everyone could see all comments. Finally, the group leader would compose all the comments again. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

Most of the tasks would look like this: The due date was already set. For an easy task, we would get it done first. Most of those were single tasks that were easier because we did not need to consult or wait for someone, so it could be done easily. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

For the hard tasks, we needed to take extra time to complete the set. (Mana, an asst. prof., with more online experiences, e-Courseware designer)

Before I disappeared, I would ask my friends to let everyone in the group know, and to keep track of class activities for me. When I came back, I would check back again with my friends and on the course web, and I tried to get everything done immediately. (Peera, the youngest participant, working in the HRD field, e-Project manager)

For example, supposing that the task of that week was divided into 10 topics, I had to finish at least 2 or 3 topics each day and post to a forum to share ideas with my classmates. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

First, I had to recheck and follow up with the TA. Then I tried to get everything done as soon as possible. Even when it passed the due date, I had to make a request to turn it in late. (Kin, a busy teacher in a huge high school, e-Courseware designer)

Kin not only planned for her current course but also planned to finish in all three courses of TCU's E-learning professional program. She also mentioned during the interview:

I didn't take all 3 courses at the same time. There were twelve subjects in each course. Each course had both core subjects and elective subjects. Some subjects could be used in other courses. When I completed one course, I could transfer some subjects to another course and take other subjects to complete another course. Therefore, I decided to learn all three courses of the E-learning Professional Program of Thailand Cyber University. (Kin, a busy teacher in a

huge high school, e-Courseware designer)

According to the qualitative analysis results, successful online learners used more than one metacognitive self-regulation strategy such as monitoring, planning, and regulating in order to keep up with course activities, assignments, or any other online learning tasks. These qualitative results also support the results from quantitative analyses that successful online learners had a quite high level of metacognitive self-regulation (Mean = 5.50, *SD* = 0.98).

Critical Thinking

Critical thinking refers to a type of reasonable reflective thinking, an individual's use of strategies such as applying current knowledge and previous knowledge, making critical evaluations, and deciding. Generally, respondents in the current study reported the critical thinking strategies they used in term of applying knowledge (45%), reviewing the materials before an exam (35%), and evaluating (20%). During the interviews, participants were asked what strategies that they thought were helpful for reviewing before an exam. The following are some examples reported by successful online learners:

First, I would check the main purpose of the subject. Then, I checked myself, which topics I had not understood, so that I could specifically refer to the topic that I wanted to review and recall it to my old knowledge. I would read only the part I needed to review, not read them all because the content was quite a lot. I mostly read from the marker that I made every week because I knew that the one with marks was important. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

When it was time to review for an exam, I re-read from the printout that I had important marks and short notes on. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

There were many cases. For example, I would call my friends to be together with

them. It would be the week before a quiz or exam. We came together for eating and tutoring, having conversations, discussions, and peer tutors. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

I mainly reviewed from my picture summary. If I had some doubt about any part, I just went back to read that part. It made it easy. (Kin, a busy teacher in a huge high school, e-Courseware designer)

Participants were asked if they believed the E-learning program to be beneficial to online learners. Most thought that the knowledge gained from the E-learning program could be applied in their workplaces:

I'm working in the field of HRD, training and knowledge management, so I think the knowledge from this course can be applied in my job because I plan to develop online training in my workplace. (Peera, the youngest participant, working in the HRD field, e-Project manager)

Actually, I can do a lot. Our organization has 3 people who came together to study in 3 E-learning courses (e-Teacher, e-Courseware designer, and e-Project manager) in order to develop a Pilot E-learning program in our company in all processes. In our company, we have no direct knowledge about teaching, learning, and instructional systems. When we came here, we learned the principle of teaching, how to motivate learners, how to create instructional media, standards of media, and enterprise management. All of these are really useful for our job and our organization. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

Respondents also reported about course activities in which they had to use strategies of critical thinking to criticize and discuss their colleagues' ideas:

They provided three or four facts. Then, asked about what we thought. The idea of an individual may not have been right or wrong because all the terms were not the same. One may have thought this way, another may have thought in another way. Then, they put it all together and let other classmates criticize and discuss. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

If someone agreed with us, they would add some more information. The suggestion came with some points of agreement and some disagreement. (Samang, a female radiological technologist and faculty member, e-Teacher)

When I found some posts that people had written about different ideas, or

sometimes they were not directed to my interest, I had to find out from books, such as a new software program that not many people knew how to use. So, I had to find out from many texts in the library. (Mana, an asst. prof., with more online experiences, e-Courseware designer)

It was a knowledge management that we could exchange our understanding. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

Some participants gave their opinions on TCU's E-learning program, stating that it was well organized and an effective system for online learning:

I think TCU has a good system for online learning. The course has a clear plan to study for the period of the course term. The instructors provided the contents for learners to log in to learn. The learner society knew how to behave and react to the course's activities; for example, the new activity would be on every Thursday. Everyone would do well to take a look and distribute the task. Meetings or group activities would be set by appointment on Google Docs. If someone were unavailable, they would let the group know. (Mana, an asst. prof., with more online experiences, e-Courseware designer)

It was good organization of TCU, I think. Both instructors and the TA tried to stimulate all learners to come together, to learn together, and to get everyone to participate in all learning activities. It was different from other online learning courses that I have taken. (Peera, the youngest participant, working in the HRD field, e-Project manager)

In addition to these opinions, Kin addressed some issues found in online learning systems:

However, the problem was the instructor might not have time to check the web board every day, so no one responded to my post, and the due date was coming. Thus, I had to guess based on what I had read, and I tried to get it done. This was the disadvantage of online learning that needed to be improved. Another issue was that the answer posted to the web board was written, so it was not like a conversation. It had to be clear in meaning and directed to the question. (Kin, a busy teacher in a huge high school, e-Courseware designer)

These qualitative results support the theory that critical thinking strategies are crucial in helping online learners learn effectively. It was found that successful online learners used critical thinking strategies widely in different ways. Similarly, in the

quantitative analysis results, critical thinking was found to be important for predicting academic course grades in successful online learners. There was a statistically significant positive relationship ($t = 1.993, p < 0.05$) between SRL strategies and academic achievement.

Time/Study Environmental Management

Time/study environmental management refers to an individual's initiated efforts to choose, manage, or arrange time, schedule, physical setting or environment in order to complete learning tasks. Based on the analysis results, when participants were asked how often they logged on to the online learning website, most of them said that they logged on to the course website once a week:

I logged in to TCU's website once a week. (Samang, a female radiological technologist and faculty member, e-Teacher)

Mostly, I checked course activities once a week, or more than that sometimes. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

Some respondents said that they went online every day, but others reported that they did not have time to log on to the online learning platform regularly.

I usually checked the course web every day, but sometimes I went out of town and would disappear from online class activities. (Peera, the youngest participant, working in the HRD field, e-Project manager)

The first time, I logged in to the course web every day, but it was very stressful because I had to work and study simultaneously. Then, I had to adjust myself. First, I needed to log in on the first day of a lesson posting in order to check the task, text, and assignment. I, then, rearranged my own schedule. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

I'm a government officer. I had to go online for my courses before or after my working hours. I woke up in the morning and went to work early at seven o'clock in order to go online for my online learning because my workplace, at the university, offers Wi-Fi Internet for everyone. (Suchart, the oldest interviewee, a

male assoc. prof., e-Project manager)

Similarly to Suchart, Kin reported that she had to go online only when she was free from work. She reported that:

I'm a teacher working in a large school, so I'm always busy. I had almost no time to check e-mail or log in to the course website, but I had to remind myself to go online anytime that I was free from work. (Kin, a busy teacher in a huge high school, e-Courseware designer)

In addition to discussing logging in to the course website, participants addressed whether they used time management to adjust themselves to match with their course schedule:

I set my own planner on my cell phone to be matched with course schedule. (Mana, an asst. prof., with more online experiences, e-Courseware designer)

We had about a week for each assignment. An assignment was posted each week. It could be a little late if we could not finish on time, but we had to show task progress. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

I needed to manage my time and make a habit because otherwise I would not finish an assignment. If I rarely checked, I would get behind, and I could not continue on the learning task. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

It depended on the schedule. They always had a duration time of an announcement. I then tried to check and get it done on time, but sometimes I was lost. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

I had to manage my time from my work schedule to see how work and study could be balanced. I might set 3 days for study and set the number of hours per day. So, in addition to a normal work schedule, I needed to clear everything and reschedule for my study plan. (Kin, a busy teacher in a huge high school, e-Courseware designer)

For the management of the study environment, participants pointed out that they rarely

had a physical setting. Instead, they set up online environments using discussion boards and social networks, such as Google docs, to meet and complete a collaborative project online:

The instructor always let us set up our own group. They mostly were groups of 3-4. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

The main group activities would occur in Google Docs. We always met in Google. We had a group meeting through Google Talk, where anyone could do anything on their own stuff at any place. (Peera, the youngest participant, working in the HRD field, e-Project manager)

Either I or some of my friends wrote an appointment posted to the web board, and everyone had to come online at the same time. We would have a conversation and discussion and edit together as a real meeting. But if it was not ready, someone might leave the post, and another would add some more comments later. A chat room was used sometimes, but not much because I'm slow at typing, and I didn't have much time to sit in front of the computer. (Kin, a busy teacher in a huge high school, e-Courseware designer)

During the interview, Suchart pointed out an interesting issue about the learning infrastructure in Thailand:

It's absolutely right that in the rural areas, you can carry your laptop, but you never get access to the Internet. With no Wi-Fi, you cannot do anything online. With no Internet at home we cannot read or study online! Online learning cannot be successful! I wake up in the morning and go to work early at seven o'clock in order to go online for my online learning because my workplace, at the university, offers WiFi Internet... (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

Suchart's responses reflected the fact that the information communication and technology (ICT) infrastructure in Thailand, especially for E-learning, still needed more development.

Based on the qualitative results, the reported use of time/study environmental management strategies was less than that of other learning strategies (14.01%). On the

other hand, the quantitative analyses results indicated that time/study environmental management significantly correctly predicted the academic course grade of successful online learners ($\beta = 1.863, p < .05$).

Elaboration

Elaboration refers to an individual's use of strategies such as paraphrasing, summarizing relating ideas, and pulling together information from all different sources. Many participants reported that they used Internet search engines, such as Google, to seek more information and used keywords and mind mapping techniques to memorize the contents. When they read learning materials, most of them defined themselves as paper readers, not screen readers. The following quotes are some responses to the elaboration questions:

If it was a single task, I would start finding out where to find the instructor's PDF files. If the instructor assigned finding more information, I would take a keyword and search on Google to find more PDF files from inside and outside of our country in both English and Thai. Sometimes I had to go to the university library to find more information because the university library has online links to other universities in and out of the country. If they had books, I would borrow them, but if it was a PDF, I had to print it out and spend some time during lunch or break times to read it. (Suchart, the oldest interviewee, a male assoc. prof., e-Project manager)

Samang, Noree, and Mana stated that they used the same technique, keywords, to seek more information for online learning course. Noree and Peera also explained further that they had to compare and analyze the answers from Internet search engine.

Yes, I just entered the keyword, which I did not know about. Then, I could see a lot of items that I had to compare in order to analyze which one I wanted to use. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

Google can give me more meaning both with specific details and wide general information. And because of my style, that I love to watch a video, another most often used online tool was YouTube. On YouTube, I can have both audio and

video. It encourages me to search more and more. Videos on YouTube helped me to understand faster and made a match with the pictures in my mind and something that I have read before. (Peera, the youngest participant, working in the HRD field, e-Project manager)

When participants were asked about reading technique, most of them designated themselves as paper readers:

Reading on screen, sometimes I forget what I've read, but in print, I can read and hi-light the important parts. Even though we can do hi-lighting on a computer, I do not feel comfortable with it, and it cannot be done on time. (Samang, a female radiological technologist and faculty member, e-Teacher)

For me, I did not feel comfortable reading on screen. I prefer to read from paper print out. Another good thing about print is that I can take short notes, but it cannot be done on a computer. This is just for a brief reading. When it's time to remember, I re-read from print what I have important marks and short notes on. (Noree, an administrative coordinator, first time in an online course, e-Teacher)

I'm a paper reader. I like to read on paper that I can hi-light and make my own conclusions. I usually take notes in my handwriting. It made it clearer for me, and I remembered where it was. Sometimes I rearranged new content by myself. (Peera, the youngest participant, working in the HRD field, e-Project manager)

In contrast to others, Poom defined himself as a screen reader.

I used a computer notebook because I work with a computer, and I used it all the time. I think I'm a screen reader because the screen can go with me everywhere. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

More elaboration strategies for reading and memorizing were reported:

I used the lesson print out, read and summarized in my own style like mind mapping. I wrote out mind mapping and tried to link other information; then I summarized in my own style. If parts were not quite clear, I would take a look at the original sources. The video lecture is my favorite part because I don't like reading. Reading is my problem. I felt uncomfortable with reading comprehension. I usually started by watching the video first, then read for review and to get more understanding. Sometimes the lesson itself didn't have a video lecture, and I had to look at another related video to help me get an idea before I started reading. For me, watching a video lecture could save my time because I could see pictures and draw mind maps easily. (Peera, the youngest participant, working in the HRD field, e-Project manager)

I would look around to see the overall content first. Then I took a look at the purpose of the study to see what they wanted us to learn in each topic. When I studied the course materials, I would check which parts related to the purpose of the study. Then I made a summary lecture, but I didn't like to take notes as a text. It's difficult to remember, so I drew a conclusion in the form of pictures or a mind map. It was clear to me then. I tried to connect everything to form a story. I used my own ideas to rearrange the content and composed a new story as a poem or a jingle or a short song. I don't care whether it sounds funny or not, it helped me and was easy to remember. This is my personal technique because I love to write poems. (Kin, a busy teacher in a huge high school, e-Courseware designer)

I first downloaded everything I needed into my computer. When I read, I usually read on screen and used Adobe Acrobat Pro to help me mark important topics and interesting issues. I would look at the task or assignment first. Then, when I read, I would scan for which topic could be applied to the task or assignment, and marked it as an important topic. (Poom, a male, working in a Pilot E-training program, e-Courseware designer)

Overall, elaboration strategies were reportedly used by respondents at a high level (19.75%). Based on the qualitative results, this evidence supports the quantitative results that successful online learners had a high level of elaboration strategies (Mean = 5.81, *SD* = 0.92).

Online Learning Tools

Respondents were asked to report their use of online learning tools when they studied online. Most of them used more than one tool when taking an online course. Results from NVivo 9 qualitative analysis revealed that most participants made use of online learning tools in 3 purpose areas: 1) 39% used them for the purpose of social activities (synchronous) such as TCU's web board, Google docs, Facebook, etc.; 2) 37% used them for the purpose of communication (asynchronous) such as e-mail, course website, texting, etc.; and 3) 24% used them for the purpose of searching such as Google, YouTube, bing, Acrobat Reader, etc. The analysis results are shown in Table 29.

Table 29

Example Quotes about Online Learning Tools

Example Quotes	Tools
Social activities Tools	
<p>I'm also a member of one of those Facebook groups named "....."I think Facebook is fast communication. When some important things happen, it will be on Facebook. (Noree)</p>	Facebook
<p>For me, Facebook is used for urgent and instant communication. We can check or update it all the time. It is an unofficial way! (Mana)</p>	Facebook
<p>When I contacted with friends, I mostly used Facebook, and sometimes I used Skype.I have used Google Docs,...At that time, I used it to keep notes like my personal diary that I could open anywhere, but I never used it for sharing with other people before. Since I enrolled in TCU's course, I have learned a lot of utilities of this online software. It's really useful. ...Mostly we communicated with the instructor in TCU's web board. It was an asynchronous communication, where we posted questions into the web board, and the instructor would post an answer later. Everyone in class would be able to see and post their comments. (Peera)</p>	Facebook Skype Google Docs TCU's Web board
<p>I used some others in the past, but now only Facebook is used. ...When we worked on homework, we had to use TCU's website. (Samang)</p>	Facebook TCU's website
<p>We usually posted on the web board; the chat room was used sometimes, but not much because I'm slow at typing, and I didn't have much time sitting in front of the computer. ...I used Facebook sometimes, but not much because some senior people didn't use it.TCU has used Google Docs to have a real time conference, having people in class to have a conversation, chat, and post information into the same place at the same time without travelling. Also, Facebook and blogging were used sometimes with group meetings. (Kin)</p>	Web board chat room Facebook Google Docs Blog

(table continues)

Table 29 (continued)

Example Quotes	Tools
Social activities Tools (continue)	
<p>If it was a group assignment, we would post onto Google document. Group members would comment on the post so everyone could see all comments. The instructor used Moodle for us to post all activities.We used Google Docs because the instructor assigned us to work together. We used Facebook only in groups of learners. In online learner groups, we often used it at the beginning of the course but rarely used it at the end of the course.In Thailand, I think Facebook is the most prevalent. (Suchart)</p>	<p>Google Docs Moodle Blog Facebook</p>
<p>I used them sometimes like web board and Wiki, but just a little. For informal communication, I used Facebook sometimes a few years ago for live chat and to deliver files in a group of friends. Sometimes it helps a lot. (Poom)</p>	<p>Web board Wiki Facebook</p>
Search engine Tools	
<p>I would take a keyword and search on Google to find more PDF files... Google was the most important tool. ..Next Step is a software program like Acrobat Reader that has to be on every computer for reading the PDF files. (Suchart)</p>	<p>Google Acrobat Reader</p>
<p>Yes, I just entered the keyword, which I did not know about. Then I could see a lot of items that I had to compare and analyze which one I wanted to use.... Google is the most used. (Noree)</p>	<p>Google</p>
<p>I mainly used Google to search for information... After I took online courses, I knew more about the online tools because I love to learn something new. Most instructors focused on innovation technologies. I have learned a lot of online learning tools. Sometimes I could not decide which tools I should use.It gave me more confidence to use them. When I taught my students, I let them learn new things and focused on implementation in everyday life. (Kin)</p>	<p>Google</p>

(table continues)

Table 29 (continued)

Example Quotes	Tools
Search engine Tools (continue)	
<p>For search engines, I mainly used Google and Google Scholar because Google can give me more meaning with both specific details and wide general information. Another most often used online tool was YouTube. On YouTube, I can have both audio and video. It encourages me to search more and more. (Peera)</p>	<p>Google YouTube</p>
<p>I used Google as a search engine tool. I feel that Google is the best search engine. It gave me more choices than the other tools. I had used Bing before, but it did not work well for me. ... I usually read on screen and used Adobe Acrobat Pro to help me mark important topics and interesting issues. (Poom)</p>	<p>Google bing Acrobat Pro</p>
Communication Tools	
<p>I texted to text all my group members from my phone. (Mana)</p>	<p>Texting</p>
<p>In online class, we mostly used e-mail to contact each other. ... However, I think it would be better if the instructor could respond immediately via e-mail. (Peera)</p>	<p>e-mail</p>
<p>The online tools are fast, saving my time and energy. e-mail was the most favorite tool for me because it has been used to attach any written text or images for a long time. I used some modern styles of online tools like Facebook, but some people did not use them, so I need to keep the old fashion for senior people that I contact with, not only keep it modern. (Kin)</p>	<p>e-mail</p>
<p>I mostly contacted the instructor and friends via the TCU website, but e-mail also was used to contact group members because sometimes we had to work on group projects, so email could be useful and more private than the university web board. E-mail is the tool that I often used. I used Hotmail, which is free e-mail that everyone can use. There is also a warning in MSN that told me when e-mail was in. (Poom)</p>	<p>TCU website e-mail MSN</p>

Summary of Findings

The current research focused on the relationships between self-regulated learning characteristics and academic achievement based on a) course completion and b) course grades. Demographic factor differences in self-regulated learning characteristics among Thai online learners were also investigated. The demographic information and the descriptive statistics of each variable were reported. Results from a confirmatory factor analysis indicated that the present data were appropriate for a principal components analysis, and all item-questions fell into the same structure as had been found in the previous research; the Cronbach's alpha values for all seven subscales were larger than 0.80, presenting high reliability on each subscale. The correlation analysis showed low correlation of motivation factors and significant correlation of learning strategy factors, indicating that the four SRL learning strategy factors were influenced by each other; however, there was no relationship between the motivation factors and the learning strategy factors. The Independent Sample *T-test* results revealed a significant difference in SRL learning strategies between successful and unsuccessful online learners. Successful online learners had a higher level of all 4 SRL learning strategies characteristics than those who did not succeed in the course.

Results from the multiple regression analyses indicated that only 2 independent variables, critical thinking and time/study environmental management, were significant predictors of academic course grade in successful online learners, with a small effect size ($R^2 = .113$). Comparison of mean differences in the different demographic subgroups revealed that female online learners reported a significantly higher level of task value than males; younger online learners had a significantly higher level of test

anxiety than older online learners; married online learners reported a significantly higher level of self-efficacy and task value than single learners; online learners who had more Internet use experience reported a significantly higher level of self-efficacy, metacognitive self-regulation, and time/study environmental management than those who had less Internet use experience; and there was no statistical significance difference in the SRL level between undergraduate and graduate online learners, nor was there a difference between online learners who had some online course experience and those who had no online course experience.

In addition, the qualitative findings from semi-structured interviews revealed that there were 4 SRL learning strategy categories and 1 online learning tools category. Learners overall responded very highly in the online learning tools category (29.3%). However, critical thinking and time/study environmental management were reported at low levels of 12.74% and 14.01% respectively. This qualitative evidence was surprising given the results of the quantitative findings from the multiple regression analyses, which supported the theory that those 2 factors were significant predictors of a learner's course grade. On the other hand, there were a high number of references in the metacognitive self-regulation category; respondents reported that they followed the course schedule, used bookmarks, and made plans in order to keep track of learning tasks and all course activities. Qualitative analyses also revealed that participants used critical thinking strategies in 3 different areas, which were applying knowledge, reviewing materials, and evaluating. Most of participants reported that they could apply the knowledge gained from the E-learning programs in their work, and also that the program was a well-organized system for online learning. Time/study environmental

management strategies were reported used by respondents in many ways. All of them had to set up online environments using web boards and social networks to meet and complete a collaborative project online, and most of them used the time management strategy to match their schedules with the course schedule and logged on to the course website once a week. elaboration was the last SRL learning strategy category that participants were asked about. Respondents reported that they used search engines, the university digital library, and YouTube to seek for more information about online learning. They used keywords and mind mapping techniques to memorize the contents, and they used more than one strategy to organize their learning materials. Six of them stated that they were paper readers, and one respondent identified himself as a screen reader.

In the online learning tools category, participants reported that they used more than one online learning tool when taking the online learning course. According to the qualitative analysis results, there were 3 purposes for using online learning tools: social activities (39%), communication (37%), and searching for information (24%). Interpretations of all of the findings data are included in the discussion and conclusion of the study results in the following chapter.

CHAPTER 5

CONCLUSION AND DISCUSSION

This chapter presents a summary and conclusion of the current study. A discussion of the research findings, limitations of this study, and suggestions for future research are also presented.

Summary of the Study

The purpose of this study was to discover and describe the existing level of Self-Regulated Learning (SRL) of Thai online learners, to examine the relationship between SRL and academic achievement based on completion and course grades, and to investigate differences related to demographic factors in SRL among Thai online learners. A mixed-methods design with a modified Motivated Strategies for Learning Questionnaire (MSLQ) online survey and semi-structured interviews was used during the process of data collection. The participants in this study were online learners who enrolled in the Thailand Cyber University Project (TCU) E-learning programs. Two hundred eight online learners participated in the online surveys hosted via KwikSurveys.com. Seven successful online learners were asked to participate in the interview process at the end of course term period. The correlational study addressed 7 SRL characteristics, which included task value, self-efficacy, test anxiety, elaboration, critical thinking, metacognitive self-regulation and time/study environmental management, based on the study model of Pintrich et al. (1993) and Artino and McCoach (2008). Academic achievement was measured by: a) the grouping of successful vs. unsuccessful online learners and b) data on the course grades of successful online learners at the end of course term period.

Finding and Discussions

Research Question 1

Research question one asks, what is the existing level of online learners' SRL in Thai online learning environments? The descriptive analyses revealed a high average score in 6 of the self-regulated learning characteristics of Thai online learners, which were task value ($M = 6.16$), self-efficacy ($M = 5.53$), elaboration ($M = 5.07$), metacognitive self-regulation ($M = 4.77$), critical thinking ($M = 4.56$), and time/study environmental management ($M = 4.39$), but a low average score, which was close to the midpoint average, in test anxiety ($M = 3.27$). The findings from this study are in line with results from previous studies. Wang (2010) reported high levels of motivation, learning strategies, and technology self-efficacy, but a low level of test anxiety in the final model that explains the relationship between self-regulated learning and course outcomes in online learning settings. It was not unusual that the findings showed a low level of test anxiety because the test anxiety characteristic was defined as an affective component (Pintrich, et al., 1993). Also, Hill and Wigfield (1984, cited in Pintrich & De Groot, 1990) found that highly anxious students reported less self-regulation and persistence. Also, in work on the theory of cognitive models of test anxiety, Benjamin, McKeachie, and Lin, (1987, cited in Pintrich & De Groot, 1990) stated that for some test-anxious students who actually have adequate cognitive skills, test anxiety during exams engenders worry about their capabilities, which interferes with effective performance (Pintrich & De Groot, 1990). Additionally, Steltenpohl (2012) found that her findings regarding the comparison between unsuccessful students and successful students in math test anxiety agreed with findings of other research that math test anxiety was inversely correlated with

achievement.

The overall associations among SRL characteristics were examined by correlation analyses. There were considerably low correlations on the motivation subscales and high correlations on the learning strategies subscales. According to the correlation analyses, there was a significant correlation in SRL characteristics within the same domain; for example, self-efficacy was positively significant correlated with task value and negatively significantly correlated with test anxiety, implying that Thai online learners who have high self-efficacy tend to have more task value and less test anxiety. Similarly, there was positively significant correlation between four SRL learning strategies, indicating that metacognitive self-regulation, critical thinking, time/study environmental management, and elaboration were influenced by each other. In the pilot study (Samruayruen, Enriquez, Natakautoong, & Samruayruen, 2013), it was found that one of the factors in the motivation domain, test anxiety, was not significantly related with any factor in any domain. Similarly, Pintrich and De Groot (1990) stated that test anxiety was not significantly related in a linear or nonlinear fashion to the use of cognitive strategies or self-regulation. In contrast to this point, test anxiety was supposed to be related with some components of self-regulation strategies.

Contrary to expectations, there were no significant correlations across between SRL motivation subscales and the learning strategies subscales. These results are inconsistent with the finding from the pilot study (Samruayruen et al., 2013) and previous investigations (Artino & Stephens, 2006; Pintrich & DeGroot, 1990; Zimmerman & Martinez-Pons, 1990). Artino and Stephens (2006) reported that students' self-reported task value and efficacy were significant positive predictors of

their reported use of learning strategies, such as elaboration, critical thinking, and metacognitive strategies. Other research supported the idea that the motivational components were linked in important ways to student cognitive engagement, and the intrinsic value was very strongly related to the use of cognitive strategies and self-regulation (Pintrich & De Groot, 1990). Samruayruen and colleagues (2013) reported that the overall correlation between the learners' motivational components and the learners' self-regulation strategy components had a significant correlation ($r = .37, p < .01$). Lynch and Dembo (2004) concluded that the significant correlation found in their study indicated the relationship between learner motivation and the behavioral strategies involved in learner control of study time and study environment. The lack of a significant relationship between motivation and learning strategies characteristics in the present study may be partly explained by the nature of Thai learners, i.e., that they are always collaborative and help each other as a group of learners instead of primarily engaging in self-study; therefore, whether they had high or low level of motivation, they would perform learning strategies which involved following a group leader or group members in order to complete the tasks. This argument may be consistent with the qualitative findings in the present study regarding the fact that some interview participants pointed out their collaborative learning and study in groups:

We had a group stimulator, especially in our group that had Suchart as a group leader. (Noree)

I set up a group and took care of everyone. (Suchart)

The leader provided us with encouragement or incentive. Sometimes we were busy and don't want to do anything, but our group leader tried to call us and told us to fight, to not give up. So, we had to work on our assignment again. (Samang)

He was really a role model. He was attentive to everyone. Even though he is close to retirement, he still tried to encourage everyone. (Noree)

I always got encouragement from him. (Mana)

When they studied in groups, they helped each other and motivated each other. Thus, when they self-reported their learning strategy use, there were not dependent on their motivation beliefs. Therefore, follow-up research is needed in terms of understanding the relationships between motivation, learning strategies, learning style, and the role of online learners.

Research Question 2

Research question two asks, what is the relationship between SRL characteristics and academic achievement in Thai online learning environments? Due to the fact that the academic achievement in the current study was based on course completion and course grades, two hypotheses were put forward:

Hypothesis 1: Successful online learners will have levels of SRL different from those of Unsuccessful online learners. This will also be true for major disaggregated groups based on a) gender, b) educational level, c) age range, d) marital status, e) Internet use experiences, and f) online course experiences.

To test hypothesis 1, independent sample *t*-tests were conducted. The results indicated that there were no significant differences between successful and Unsuccessful online learners in any of the 3 SRL motivation characteristics (task value, self-efficacy, and test anxiety). Meanwhile, there were statistically significant differences between successful and unsuccessful online learners in all 4 SRL learning strategy characteristics (metacognitive self-regulation, critical thinking, time/study environmental management, and elaboration). Therefore, the null hypotheses of a significant

difference in SRL motivation characteristics failed to be rejected, but the null hypotheses of a significant difference in SRL learning strategy characteristics was rejected. The first part of this finding, about motivation, is contrary to previous research. Puzziferro (2008), for instance, found that students who are self-regulating are significantly more likely to be successful in school, to learn more, and to achieve at higher levels. Lynch and Dembo (2004) pointed out that “Efficacy enhancing activities and feedback should then be designed into the course as a means of assisting these students to successfully complete the course” (p. 7). Artino and Stephens (2006) also mentioned in their study that students with adaptive self-regulatory beliefs, emotion, and behaviors outperform their less adaptive counterparts.

There are several reasons that may explain why the motivation characteristics were not different between unsuccessful versus successful online learners. First, the small sample size for the entire study as well as the difference in the number of unsuccessful ($N = 50$) versus successful ($N = 138$) online learners completing the survey may have affected the results; when the means of all of the participants were analyzed, the means may have been skewed in favor of successful online learners, and this may have resulted in unclear differentiation between the two groups. Another reason could be that the participants did not understand the item questions and did not clearly understand the meanings of some of the questions because of the cultural differences between Thais and Americans. For example, take Item 1, “I believe I will receive an excellent grade in this class” and Item 9, “I’m confident I can understand the most complex material presented by the instructor in this course”. Most participants responded with 3, 4, or 5 of the 7-point Likert scale. These two items may be assumed

to represent the learner's belief and confidence as part of American culture, but the highest of lowest levels of belief or confidence are normally not present in Thai culture or at least they are not expressed by individuals. Therefore, future research should be more circumspect in selecting item questions from the MSLQ because not all item questions can be used in different cultural areas.

With regard to the learning strategy characteristics, the findings from the current study indicated that there were significant differences between Unsuccessful and successful online learners in all four SRL learning strategies (metacognitive self-regulation, critical thinking, time/study environmental management, and elaboration); and Cohen's effect size value ($d = 3.67$, $d = 1.28$, $d = 3.77$, and $d = 2.44$ respectively) suggested a high practical significance. These findings parallel those in the study of Steltenpohl (2012), who found that successful students reported higher levels of organization, metacognitive self-regulation, time management, and effort regulation than unsuccessful students. These results are consistent with the qualitative findings that successful online learners' responses indicated high levels in metacognitive self-regulation (24.2%) and elaboration (19.8%), and moderate levels in critical thinking (12.7%) and time/study environmental management (14.0%). The following quotes are some responses from interviewees that indicated how they applied learning strategies in online learning environments:

The instructors posted all the schedules in Moodle or on instructors' web boards each week. I started checking them all on the first day. I went online and checked on the TCU Website to see if the instructor had posted any assignments or homework there. (Suchart)

I mainly followed the class schedule because they already had a long-term schedule for us. (Poom)

The instructor always posted activities at the beginning of the week, and I just checked once a week. (Noree)

I set my own planner on my cell phone to match the course schedule. (Mana)

Reading on screen, sometimes I forget what I've read, but in print, I can read and hi-light the important parts. Even though we can do hi-lighting on the computer, I do not feel comfortable with it, and it cannot be done on time. (Samang)

I used the lesson print out, and read and summarized it in my own style like mind mapping. I wrote out the mind mapping and tried to link the content to other information, then summarized it in my own style. If parts were not quite clear, I would take a look at the original sources. (Peera)

I tried to connect everything to form a story. I used my own ideas to rearrange the content and composed a new story as a poem or a jingle or a short song. I don't care whether it sounds funny or not, it helped me and was easy to remember. This is my personal technique because I love to write poems. (Kin)

From the sample interview quotes, it can be seen that successful online learners reported using all learning strategies in different ways. However, there were no unsuccessful online learners who participated in the qualitative process because the interview was conducted at the end of course term period, and only successful learners were present in the online course until the end of the course. Therefore, an early interview at the middle of course term period should be planned in future research.

Hypothesis 2: Among successful online learners, those who have higher levels of SRL will have higher course grades.

To test hypothesis 2, multiple linear regressions were performed. The analysis results had a coefficient of multiple determination at 0.113 ($R^2 = .113$), indicating that about 11.3% of the variation in the course grades of successful online learners is explained by the value of two predictors, critical thinking ($\beta = .170, p < .05$) and time/study environmental management ($\beta = .288, p < .05$) characteristics, predicting

higher course grades. The results showed that at least one of the predictors is useful for predicting course grades. Therefore, the null hypothesis was rejected for those 2 SRL characteristics, but it failed to be rejected for the other 5 SRL characteristics. The findings suggest that there were significant positive relationships between critical thinking and course grades, and between time/study environment management and course grades. These findings agreed with those of Steltenpohl (2012), who made a comparison between successful versus unsuccessful online and face-to-face students, that successful students showed the highest use of self-regulated learning processes related to time management and effort regulation for both online and face-to-face methods. Also, these results coincide with those from Puzziferro's (2008) study that time and study environment regulation and effort regulation subscales had a significant relationship to achievement in online courses. Similarly, Yukselturk and Bulut (2007) found that success in an online course was significantly and positively correlated to intrinsic goal orientation, task value, self-efficacy, cognitive strategy use and self-regulation. In the (2001) study of Shih and Gamon, the MSLQ was used as part of the learning strategy measurement to study the relationships between learning styles and strategies and final grades in online courses; they found that student use of learning strategies accounted for one-fourth of student achievement in the online course in their study. However, the results from the current study did not support the finding of previous research that self-regulated learning motivation, especially self-efficacy, affected course satisfaction and performance (Artino & McCoach, 2008; Puzziferro, 2008; Zimmerman, 2000). Kuo (2010) stated "Generally, students with higher self-efficacy for completing a task are more likely to have higher motivation, make greater

efforts, and persist longer than those with lower self-efficacy (pp. 22). In the present study, none of the SRL motivation characteristics (self-efficacy, task value, and test anxiety) was a statistically significant predictor of the academic course grades; online learners who had higher levels of self-efficacy or task value did not report higher course grades at the end of the course term period. A reason that might explain the unexpected findings is the timing of the survey. Because the survey was distributed during the first week of course term period, most online learners reported in the same direction, with high levels of self-efficacy and task value, but low levels of test anxiety. However, almost 50% of the participants had never had online course experience before this study, so they might not have had a clear understanding about the methodologies of taking online courses. Even though they reported had high motivation, their course grades could not be expected to be high at the end of the course term period. Additional research should be done with a larger sample and in the middle of the course term period to avoid the issue of misunderstanding regarding online learning methods.

Research Question 3

The last research question was whether there are any differences in SRL characteristics among online learners in different demographic subgroups.

Hypothesis 3: Among online learners, the levels of SRL characteristics will be different among demographic groups.

Research in Thailand has neither described the existing SRL characteristics of online learners nor examined demographic factor differences in SRL. Lynch and Dembo (2004) also suggested in their research study that individual difference variables (such as age and gender) should be investigated in future research into the relationship

between self-regulation and online learning generally. In the current study, the results from the independent sample *t*-tests and the general linear model revealed some significant differences in SRL characteristics among some demographic subgroups, including gender, age range, marital status, educational level, online course experience, and Internet use.

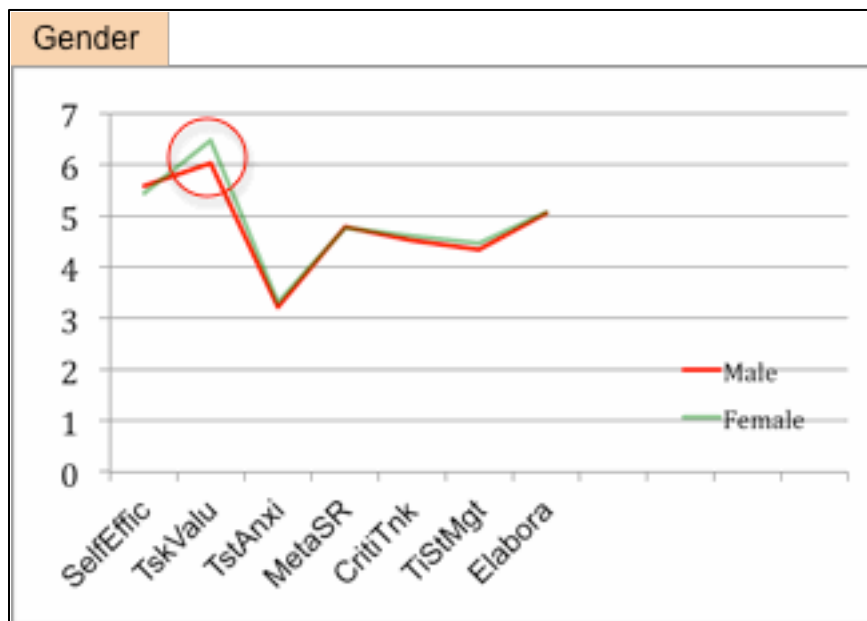


Figure 11. Gender differences in SRL characteristics

There were significant differences between males ($M = 6.04$) and females ($M = 6.28$) in the task value characteristic, and Cohen's d ($d = 0.41$) reported a medium effect size. This indicated that females reported higher levels of task value than men. This would be consistent with the literature that has shown online female students are confident, independent learners and may outperform their male counterparts online (Price, 2006). Similarly, Chyung (2007) found that female students improved their self-efficacy and task value significantly more and scored significantly higher on the final exam than male students. In the current study, there were 98 males and 90 females. As shown in Figure 11, female and male online learners' self-efficacy, test anxiety,

metacognitive self-regulation, time/study environmental management, and elaboration did not differ with regard to online learning programs. Although many researchers have stated that female and male students experience the online environment differently, the gender variable in many online learning settings was not reported as resulting in significant differences (Astleitner & Steinberg, 2005; Sierra & Wang, 2002; Yukselturk & Bulut, 2009).

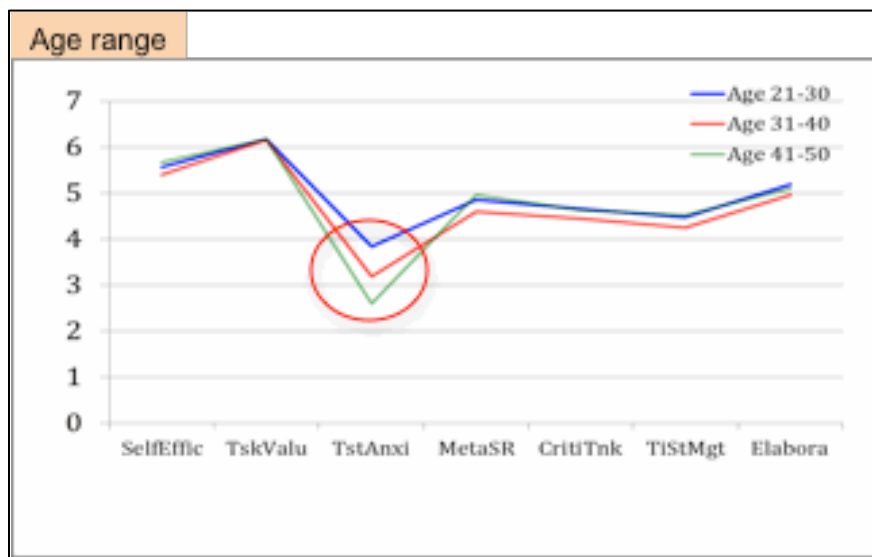


Figure 12. Age range differences in SRL characteristics

There was a significant difference in test anxiety between 3 age range groups ($F(2,186) = 14.236, p < .0001, R^2 = .133$), indicating that online learners who were younger, 21-30 years old ($M = 3.84$), had a higher level of test anxiety than those who were older, 31-40 ($M = 3.19$) and 41-50 years old ($M = 2.59$). Test anxiety is defined as an affective component and does have the capacity to influence areas within the motivation construct such as self-efficacy, task value, or goal orientation (Pintrich et al., 1993). In this study, therefore, older online learners who were more mature and had more learning experiences reported lower levels of test anxiety than those who were

younger. These findings parallel those of the pilot study (Samruayruen et al., 2013) that self-regulated learning strategies, and in particular study management was significantly correlated ($p < .01$) with educational level, highest graduation, and age range at positive levels ($r = .36$, $r = .34$, and $r = .23$ respectively), which indicated that older learners tend to have high levels of study management.

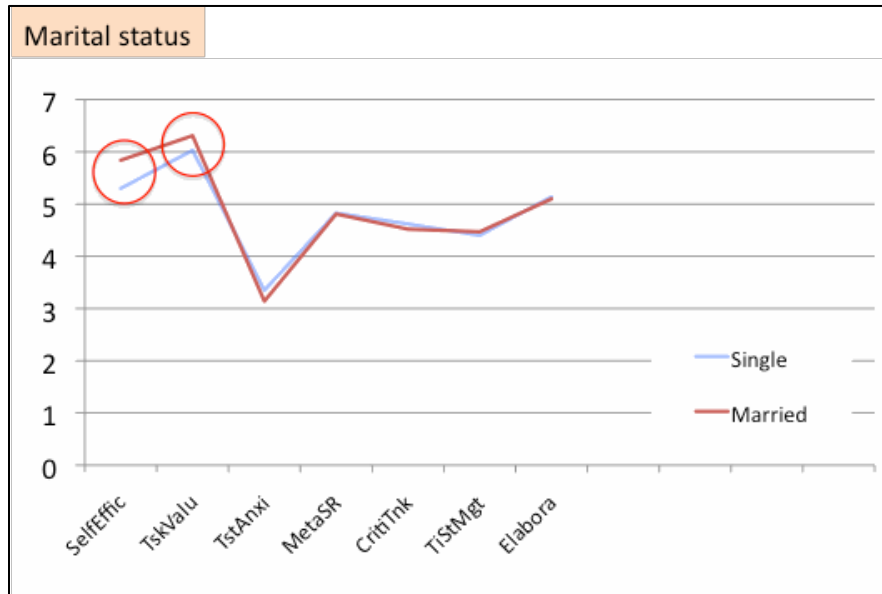


Figure 13. Marital status differences in SRL characteristics

There were significant differences between single and married online learners in self-efficacy ($M = 5.30$, $M = 5.84$), with a large Cohen's d effect size of 0.94; and a similar situation held for task value ($M = 5.30$, $M = 5.84$), with a moderate Cohen's d effect size of 0.49. This indicated that married online learners tended to have higher level of self-efficacy and task value than those who were single. These results were apparently in contrast with the results from the pilot study that there were no significant correlations between SRL characteristics and marital status. A possible explanation for these contrary findings may be the differences between the research samples of the studies. The research sample for the pilot study was formal undergraduate and

graduate students who were full time students, and just few of them were married, but the sample in the present study consisted of informal online learners who were defined as part time learners, and they were 47.1% single and 47.8% married. Thus, it is not surprising that the results were found in to lie in different directions. Further research is needed to determine if marital status might affect any other self-regulated learning characteristics in online learning environments.

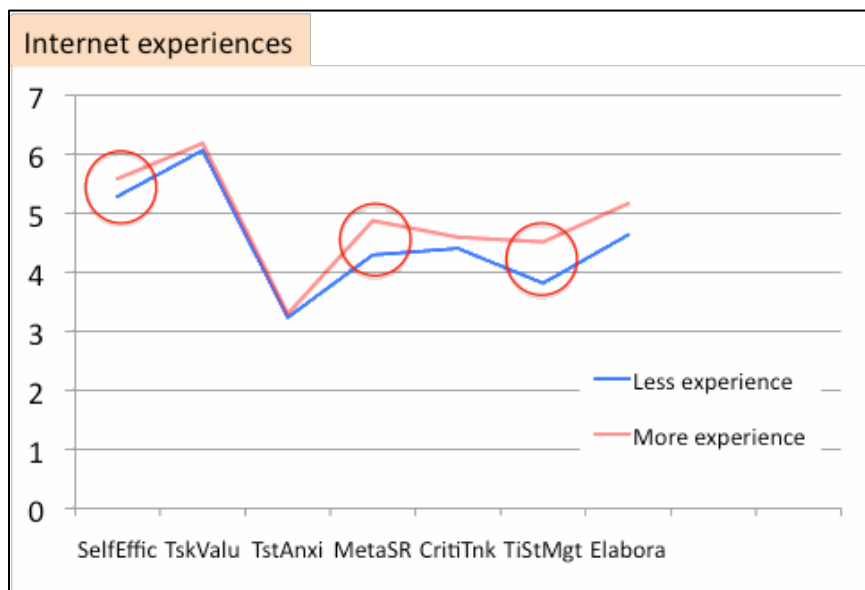


Figure 14. Internet experience differences in SRL characteristics

The next demographic subgroup was Internet experience, which showed significant differences between online learners who had more Internet experience and those who had less experience in self-efficacy ($M = 5.58$, $M = 5.28$), with a small Cohen's d effect size of 0.32; metacognitive self-regulation ($M = 4.87$, $M = 4.29$), with a small Cohen's d effect size of 0.30; and time/study environmental management ($M = 4.51$, $M = 3.81$), with a large Cohen's d effect size of 0.81. This implies that online learners who have more Internet experience also have high levels of self-efficacy, metacognitive self-regulation, and time/study environmental management. Interestingly,

the results for the elaboration characteristic, which did not show a statistically significant difference, but showed mean score that were quite different as shown in Figure 14, with a small Cohen's *d* effect size of 0.31, indicated that the level of a learner's elaboration may be considered to be effected by his or her Internet experience.

There were no significant differences between educational level groups in any of the SRL characteristics; meaning that undergraduate and graduate online learners had no differences in SRL characteristics. There were also no differences between online learners who had some experience and learners who had no experience in online learning courses. In contrast to these results, Wang (2010) and several other researchers reported that the number of previous online courses positively influenced effectiveness, which then influenced achievement (Artino, 2007; Samruayruen et al., 2013, Steltenpohl, 2012; Terry & Doolittle, 2006; Yukselturk & Bulbut, 2009).

Limitations

Although this study showed significant differences between successful and unsuccessful online learners in the critical thinking characteristic and the time/study environment management characteristic, methodological limitations of this study need to be considered when the results are interpreted. First, the clarity of the translation of the item questions in the modified MSLQ into the Thai version may not have been quite clear to Thai online learners because some English words or idioms may not have the same meaning in Thai. Although the translation was done with the help of an English-Thai teacher who is bilingual and is a professional translator, the meaning of some questions may not be suitable for the culture and circumstances of Thai online learners. The next concern is the adequacy of the self-regulated learning scale in the online self-

report survey. The survey questionnaire used for the construct was taken from the modified MSLQ, which was developed by Artino and McCoach (2008). The modified MSLQ consists of three motivation subscales and four learning strategy subscales, while the original MSLQ (Pintrich et al., 1993) was composed of six motivation subscales and nine learning strategies subscales. Although the item questions seemed representative of the motivation and learning strategies scale, not using the complete subscale may have changed the validity of the item questions, and therefore the questionnaire may have been inadequate to measure the level of self-regulated learning.

Another limitation of the study concerned the difference in the number of successful versus unsuccessful online learners completing the online survey, and the fact that no unsuccessful online learners participated in the semi-structured interview. For the quantitative method, when the means of all of the SRL characteristics were calculated, they may have been skewed in favor of successful online learners, since high achieving learners tend to have less test anxiety and more experience in the SRL learning strategies domain. Also in the qualitative method, the data came from the reports of successful online learners; therefore, the results are not sufficient to be generalized to a larger population.

Finally, due to the fact that this study was a mixed-methods research design with a self-report online survey and semi-structured interviews, the interpretation and generalization of the results to other populations should be done with care.

Conclusions

The mixed-methods research design investigated the relationships between self-

regulated learning characteristics and academic achievement based on a) course completion and b) course grades. The findings of this study indicated that Thai online learners reported high levels on the 7-point Likert scale for task value, self-efficacy, elaboration, metacognitive self-regulation, critical thinking, and time/study environmental management characteristics, while there was a low average score on the test anxiety characteristic. The overall relationships between self-regulated learning characteristics were highly correlated with each other in the learning strategies domain, but there was low correlation in the motivation domain. The results from multiple regression revealed that 2 learning strategy characteristics, critical thinking and time/study environmental management, were significant predictors of academic course grades in Thai online learning environments. Also, the current study found that some of the self-regulated learning characteristics have relationships with some learners' demographic characteristics, such as gender, age range, marital status, and Internet use.

In addition, the qualitative results showed that Thai online learners reported learning strategies used in four categories, with a high number of references to the metacognitive self-regulation and elaboration strategies, and a low number of references to critical thinking and time/study environmental management. Furthermore, the qualitative results showed that Thai online learners used online learning tools in three purpose areas, which were social learning and personal activities (39%), communication (37%), and searching for information (24%). These findings coincide with those of research by Mills and Knezek (2012), who developed the Integrated Communications Technology Learning (ICTL) scale, and found that students reported use of Social Media (SM), such as Twitter, Facebook, Google+, and other similar tools

in course communications in four categories: SM learning communication, SM interactive learning, ICTL information sharing, and ICTL information seeking. Additional study should be done to explore which online tools learners decide to use or not to use and the reasons why online learners find certain online tools beneficial.

Based on the study findings, improving learners' self-regulated learning, especially learning strategy skills, can help learners learn effectively in online learning environments. Course designers and instructors can develop online course activities to match online learners' needs in order to help learners improve their self-regulated learning strategies to be successful in online learning environments.

Suggestions

Since there has been limited research investigating self-regulated learning in Thailand, future research should consider examining the effect of self-regulated learning and comparing the results in blended or hybrid courses and in a hundred percent online learning settings. For the Thailand Cyber University Project, even though the findings from the present study may not point directly to the specific issues, improving online learning activities and applying self-regulated learning strategies in instructional design to help learners learn effectively might be helpful in reducing the dropout rate problems of the E-learning programs of the Thailand Cyber University Project.

The data collection method and instruments need to be improved. The current study used semi-structured interviews made up of several minor questions, which encouraged participants to recall or describe more of what they did during an online learning period. Meanwhile, these minor questions might have caused confusion or have interfered with participants' answers to the interview questions. Therefore, future

study should use just one question at a time, and should run directly through the semi-structured interview.

Future studies should try to find effective methods to reduce the participant dropout rate and to establish longitudinal goals for continued effectiveness. The small sample size of the current study might have affected the reliability of the study and limited the generalizability of the results. Future efforts should focus on the use of self-regulated learning strategies in order to encourage online learners to get more out of courses they perceive as not relevant by giving them an intervention program for self-regulatory skills. Future research should also study blended or hybrid courses, instead of 100% online courses, where learners receive more content interaction than direct guidance from the instructor.

APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVALS



OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC DEVELOPMENT
Research Services

April 3, 2012

Dr. Gerald Knezek
Student Investigator: Buncha Samruayruen
Department of Learning Technologies
University of North Texas
RE: Human Subjects Application No. 12-144

Dear Dr. Knezek:

In accordance with 45 CFR Part 46 Section 46.101, your study titled "Self-Regulated Learning Characteristics of Online Learning Course Completers vs. Non-Completers in Thailand" has been determined to qualify for an exemption from further review by the UNT Institutional Review Board (IRB).

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

No changes may be made to your study's procedures or forms without prior written approval from the UNT IRB. Please contact Jordan Harmon, Research Compliance Analyst, ext. 3940, if you wish to make any such changes. Any changes to your procedures or forms after 3 years will require completion of a new IRB application.

We wish you success with your study.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair, Institutional Review Board

PK:jh

APPENDIX B
INFORMED CONSENT FORM

IRB Consent Form

Self-Regulated Learning Characteristics of Online Learning Course Completers VS Non-Completers in Thailand

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

You are invited to participate in a research study to understand your experiences in taking online course. This study is being conducted by Buncha Samruayruen, a Graduate Student, under the direction of Dr. Gerald A. Knezek, Regents Professor at the Department of Learning Technologies, University of North Texas. The purpose of this study is to find out how Thai online learners feel about their implementation of self-regulated learning in online learning environments.

Your participation in this study is completely voluntary, and by participating, you have agreed to the conditions contained in this release. About 15-20 minutes of time is needed to complete the online questionnaire. You have the right to skip any questions you choose not to answer. There are no foreseeable risks involved in this study; however, if you decide to withdraw your participation, you may do so at any time by simply leaving the web site. Your decision to participate or to withdraw from the study will have no effect on your standing in this course or your course grades. You may benefit from participation through achieving learning goals, assessing your learning strategies and motivation, and probably enhancing your academic self-regulation in an online course. In addition, you can expect to be a part of assisting in increasing understanding Thai learners' self-regulated learning in online learning environments.

All research records will be kept confidential by the principal investigator. No individual responses will be disclosed to anyone because all data will be reported on a group basis. If you have questions about this study, you can contact the Principal Investigator, Dr. Gerald A. Knezek, and student investigator, Mr. Buncha Samruayruen, at (940) 565-4195 in the Learning Technologies Department, UNT, US.

By completing the survey, you are confirming that you are at least 18 years old and giving informed consent to participate in this study.

This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

If you agree to participate, you may print this document for your records. Thank you in advance for your participation.

APPROVED BY THE UNT IRB

DATE: 4-3-2015

หนังสือแสดงความจำนงในการให้ความร่วมมือในการวิจัย

ลักษณะเฉพาะของการกำกับตนเองในการเรียนรู้ของผู้เรียนรายวิชาออนไลน์ในประเทศไทย เปรียบเทียบระหว่างผู้เรียนที่สำเร็จตามหลักสูตรกับผู้เรียนที่ไม่สำเร็จตามหลักสูตร

ก่อนที่ท่านจะตกลงให้ความร่วมมือในการวิจัยครั้งนี้ สิ่งสำคัญอย่างยิ่งคือท่านได้อ่านและทำความเข้าใจถึงคำอธิบาย, เป้าหมาย, ประโยชน์และผลกระทบจากงานวิจัย, และวิธีการดำเนินการวิจัย

ท่านได้รับเชิญให้มีส่วนร่วมในการวิจัย ที่ต้องการทราบถึงประสบการณ์การเรียนรู้ออนไลน์ของท่าน การวิจัยครั้งนี้ดำเนินการโดย นายบัญชา สำราญรัตน์ นักศึกษาระดับบัณฑิตศึกษา ภายใต้การกำกับดูแลของ ดร. เจอราลด์ เอ. คเนเช็ค ศาสตราจารย์ประจำภาควิชาเทคโนโลยีแห่งการ เรียนรู้ มหาวิทยาลัยนอร์ทเท็กซัส โดยมีเป้าหมายเพื่อศึกษาลักษณะการปฏิบัติในการกำกับตนเองในการเรียนรู้ของผู้เรียนในสภาพแวดล้อมทางการเรียนออนไลน์

การให้ความร่วมมือในการวิจัยของท่าน เป็นการยินยอมเข้าร่วมการวิจัยด้วยความสมัครใจ และโดยการเข้าร่วมการวิจัยนี้ ท่านเห็นด้วยกับเงื่อนไขที่บันทึกอยู่ในโครงการวิจัยนี้ และต้องใช้ เวลาประมาณ 15-20 นาทีในการตอบแบบสอบถามออนไลน์

ท่านมีสิทธิ์ ที่จะละเว้นการตอบแบบสอบถามข้อใด ๆ ก็ได้ และสามารถถอนตัวออกจากการวิจัยครั้งนี้ เมื่อใดก็ได้ การตัดสินใจของข้าพเจ้าในการเข้าร่วม การวิจัยหรือถอนตัวจากการวิจัย จะไม่มีผล กระทบใด ๆ ต่อการเรียนหรือผลคะแนน ของรายวิชาที่ท่านกำลังศึกษาอยู่ขณะนี้ และการวิจัยครั้งนี้ไม่มีความเสี่ยงใด ๆ ที่จะเกิดขึ้นกับท่านในอนาคต ในการร่วมในการวิจัยครั้งนี้ ท่านอาจได้รับประโยชน์ผ่านการกำหนดเป้าหมายการเรียนรู้, การประเมินกลยุทธ์และแรงจูงใจในการเรียนของท่าน, และมีความเป็นไปได้ที่จะส่งผลต่อการเพิ่มขึ้นของระดับการกำกับตนเองทางวิชาการในการเรียนรู้ในสภาพแวดล้อมทางการเรียนออนไลน์

ข้อมูลทั้งหมดที่ได้จากการวิจัยในครั้งนี้ จะถูกเก็บรักษาไว้อย่างเป็นความลับ โดยประธาน คณะผู้วิจัย โดยจะไม่มีการเปิดเผยข้อมูลส่วนบุคคลของผู้ตอบแบบสอบถามต่อบุคคลใด เนื่องจาก ข้อมูลที่ได้ทั้งหมดจะถูกนำเสนอรายงานในเชิงกลุ่มภาพรวมของผลการวิจัย หากท่านมีคำถาม เกี่ยวกับการศึกษาวิจัยในครั้งนี้ ท่านสามารถติดต่อประธานคณะผู้วิจัยคือ ดร. เจอราลด์ เอ. คเนเช็ค และนักศึกษาร่วมวิจัยคือนายบัญชา สำราญรัตน์ แห่งคณะเทคโนโลยีแห่งการ เรียนรู้ มหาวิทยาลัยนอร์ทเท็กซัส ประเทศสหรัฐอเมริกา หมายเลขโทรศัพท์ 011-1-940-565-4195

โดยการตอบแบบสอบถามครั้งนี้ ท่านยืนยันว่าท่านมีอายุเกิน 18 ปี และยินยอมสมัครใจเข้าร่วมในการวิจัยครั้งนี้

โครงการวิจัยนี้ ได้ผ่านการพิจารณาและอนุมัติจากคณะกรรมการพิจารณาโครงการวิจัย (IRB) แห่งสถาบันมหาวิทยาลัยเท็กซัสตอนเหนือแล้ว โดยสามารถติดต่อสอบถามข้อสงสัยใดๆ เกี่ยวกับสิทธิของผู้มีส่วนร่วมในการวิจัยได้ที่ หมายเลขโทรศัพท์ 011-1-940-565-3940

หากท่านเห็นด้วยในการเข้าร่วมในการวิจัยครั้งนี้ ท่านอาจพิมพ์สำเนาเอกสารแสดงความยินยอมนี้ไว้เป็นหลักฐาน

ขอขอบคุณในความร่วมมือของท่านมา ณ โอกาสนี้

APPROVED BY THE UNT IRB

DATE: 4-3-2016

APPENDIX C
ORIGINAL LETTERS



COLLEGE OF INFORMATION
Department of Learning Technologies

March 21, 2012

RE: Request for permission to conduct research

TO: Dr. Thapanee Thammetar
Director of Thailand Cyber University Project

Dear Dr. Thammetar,

Mr. Buncha Samruayruen, Student Researcher at the Department of Learning Technologies and doctoral student of Educational Computing, is conducting a dissertation research about self-regulated learning characteristics of online learners in Thailand in order to find out and describe the existing Self-regulated learning (SRL) level of Thai online learners and to investigate the relationship between SRL and academic achievement. This dissertation research will be conducted under the supervision of Dr. Gerald A. Knezek (Principal investigator), Regents Professor of the Department of Learning Technologies and Director of The Institute for the Integration of Technology and Learning (IITL).

It would be a great help if you would kindly allow and encourage your online learners to participate in this dissertation research. The main task of the online learners is to complete an online survey questionnaire that takes about 15 to 20 minutes. A copy of the online survey questionnaire is attached.

Thank you for your time and consideration in this matter.

Yours sincerely,

Michael Spector, Ph.D.
Professor
Department Chair
Department of Learning Technologies
College of Information
University of North Texas



MOE 0577/162

Office of the Higher Education Commission
328 Si Ayutthaya Road
Bangkok 10400, Thailand
Tel.: +66 (0) 2 610-5237
Fax: +66 (0) 2 354-5476

March 28, 2012

Dear UNT Institutional Review Board:

Please note that Mr. Buncha Samruayruen, UNT Graduate Student, has the permission of the Thailand Cyber University Project (TCU) to conduct dissertation research titled "Self-regulated Learning Characteristics of Online Learning Course Completers Versus Non-Completers in Thailand" at TCU website.

Mr. Samruayruen will contact instructors via email in order to send out the recruitment letter and survey hyperlink to our online learners. His plan is to have survey results and course grades at the end of course period. Our instructors will provide the information regarding academic achievement for use in his dissertation research.

Mr. Samruayruen has agreed to provide to TCU a copy of the University of North Texas IRB-approved, stamped consent document before he recruits participants on TCU website, and also provide a copy of any aggregate results.

If there are any questions, please contact me at thapanee@thaicyberu.go.th

Yours sincerely,

Thapanee Thammetar

Assit. Prof. Thapanee Thammetar, Ph.D.
Director, Thailand Cyber University Project
Office of the Higher Education Commission
Ministry of Education, Thailand

Recruitment Letter (for instructors)

Buncha Samruayruen
1415 Margie St., Apt. 3
Denton, Texas 76201

Date:

Dear TCU Instructor:

My name is Buncha Samruayruen, and I am a doctoral student in Educational Computing at University of North Texas. I am conducting a dissertation research about self-regulated learning characteristics of online learners in Thailand in order to find out and describe the existing self-regulated learning (SRL) level of Thai online learners and to investigate the relationship between SRL and academic achievement. I am looking for online learners enrolled in online learning courses at Thailand Cyber University Project (TCU).

You are being contacted now because of your affiliation as an instructor of the online learning course which fit my criteria. I would appreciate it if you could inform your online learners about my online survey, or include the online survey link in your web board course. If you are interested in participating in this survey, please help forward the survey link (http://kwiksurveys.com?s=LHJJKF_a44dba18) to your online learners by email system or by any mechanisms that you normally use to communicate with your online learners. The survey itself would be delivered via Kwik Surveys tool in which learner responses are stored anonymously. If you are interested in participating or have any questions about this study, please contact me directly via email bs0142@unt.edu. I would also be happy to share the research result with you.

I look forward to hearing from you.

Best Regards,

Buncha Samruayruen
Doctoral Student
Department of Learning Technologies

จดหมายสรรหาผู้ร่วมในโครงการวิจัย (สำหรับผู้สอน)

บัญชา สำรวัยริน
1415 Margie St., Apt. 3
Denton, Texas 76201

วันที่.....

เรียน ผู้สอนแห่งมหาวิทยาลัยไซเบอร์ไทย

ข้าพเจ้าชื่อ นายบัญชา สำรวัยริน เป็นนักศึกษาระดับปริญญาเอก สาขาวิชา
คอมพิวเตอร์ศึกษา ณ มหาวิทยาลัยนอร์ทเท็กซัส ข้าพเจ้ากำลังดำเนินการจัดทำงานวิจัย
คุณลักษณะเกี่ยวกับลักษณะเฉพาะของการกำกับตนเองในการเรียนรู้ของผู้เรียนออนไลน์ใน
ประเทศไทย เพื่อที่จะค้นคว้าและอธิบายถึงสภาพปัจจุบันของระดับการกำกับตนเองในการ
เรียนรู้ของผู้เรียนไทยออนไลน์ และค้นคว้าถึงความสัมพันธ์ระหว่างการกำกับตนเองในการ
เรียนรู้กับความสำเร็จทางวิชาการ ข้าพเจ้ากำลังสรรหาผู้ร่วมในการวิจัยซึ่งเป็นผู้เรียน
ออนไลน์ที่ลงทะเบียนเรียนในหลักสูตรการเรียนออนไลน์ของมหาวิทยาลัยไซเบอร์ไทย

การที่ท่านได้รับการติดต่อครั้งนี้ เนื่องจากท่านเป็นผู้มีส่วนเกี่ยวข้องในการจัดการ
สอนตามหลักสูตรการเรียนออนไลน์ซึ่งตรงกับหลักเกณฑ์ในการวิจัยของข้าพเจ้า ข้าพเจ้า
ใคร่ขอความอนุเคราะห์จากท่านในการแนะนำผู้เรียนออนไลน์ หรือส่งผ่านเว็บลิงค์ของ
แบบสอบถาม เพื่อให้ผู้เรียนออนไลน์ในหลักสูตรของท่านมีส่วนร่วมในการตอบแบบสอบถาม
ออนไลน์ ตามเว็บ ลิงค์ที่ปรากฏนี้ (http://kwiksurveys.com?s=LHJJKF_a44dba18) แบบสอบ
ถามนี้ส่งผ่านเว็บไซต์ แบบสอบถามออนไลน์ชื่อ Kwik Surveys ซึ่งการตอบแบบสอบถาม
ของผู้เรียนออนไลน์จะถูกเก็บไว้อย่างเป็นความลับ หากท่านมีข้อสงสัยประการใด โปรด
ติดต่อข้าพเจ้าผ่านจดหมายอิเล็กทรอนิกส์ต่อไปนี้ bs0142@unt.edu ข้าพเจ้ายินดีที่จะ
เปิดเผยและแลกเปลี่ยนความคิดเห็นต่อท่าน เกี่ยวกับผลการวิจัยครั้งนี้

ขอแสดงความนับถือ

บัญชา สำรวัยริน
นักศึกษาระดับปริญญาเอก
ภาควิชาเทคโนโลยีแห่งการเรียนรู้

Recruitment Letter (for online learners)

Buncha Samruayruen
1415 Margie St., Apt. 3
Denton, Texas 76201

Date:

Dear TCU online learner:

My name is Buncha Samruayruen, and I am a doctoral student in Educational Computing at University of North Texas. I am conducting a dissertation research about self-regulated learning characteristics of online learners in Thailand in order to find out and describe the existing self-regulated learning (SRL) level of Thai online learners and to investigate the relationship between SRL and academic achievement. You have been selected because you are taking online learning courses at Thailand Cyber University Project (TCU).

I have received permission from TCU's administrator and your instructor to have you participate in this online survey (http://kwiksurveys.com?s=LHJJKF_a44dba18). Participation in this dissertation research is voluntary and, before completing the survey, you will be asked to read and electronically sign (accept) and Informed Consent. The survey will require about 15 – 20 minutes of your time. I would appreciate your filling out the online survey, and would be happy to share the result of my study with you.

If you have any questions, please feel free to contact me via email at bs0142@unt.edu. I appreciate your assistance.

Best Regards,

Buncha Samruayruen
Doctoral Student
Department of Learning Technologies

จดหมายสรรหาผู้ร่วมในโครงการวิจัย (สำหรับผู้เรียนออนไลน์)

บัญชา สำรวัยริน
1415 Margie St., Apt. 3
Denton, Texas 76201

วันที่.....

เรียน ผู้เรียนออนไลน์ของมหาวิทยาลัยไซเบอร์ไทย

ข้าพเจ้าชื่อ นายบัญชา สำรวัยริน เป็นนักศึกษาระดับปริญญาเอก สาขาวิชา
คอมพิวเตอร์ศึกษา ณ มหาวิทยาลัยนอร์ทเท็กซัส ข้าพเจ้ากำลังดำเนินการจัดทำงานวิจัย
คุณูปการเกี่ยวกับลักษณะเฉพาะของการกำกับตนเองในการเรียนรู้ของผู้เรียนออนไลน์ใน
ประเทศไทย เพื่อที่จะค้นคว้าและอธิบายถึงสภาพปัจจุบันของระดับการกำกับตนเองในการ
เรียนรู้ของผู้เรียนไทยออนไลน์ และค้นคว้าถึงความสัมพันธ์ระหว่างการกำกับตนเองในการ
เรียนรู้กับความสำเร็จทางวิชาการ ท่านได้รับเชิญให้เป็นผู้ร่วมในการวิจัย เนื่องจากท่าน
เป็นผู้เรียนออนไลน์ที่ลงทะเบียนเรียนในหลักสูตรการเรียนออนไลน์ของมหาวิทยาลัย
ไซเบอร์ไทย

ในการนี้ ข้าพเจ้าได้รับการอนุญาตจากผู้บริหารมหาวิทยาลัยไซเบอร์ไทย และคณะ
ผู้จัดการสอน ในการขอเชิญให้ท่านมีส่วนร่วมในการตอบแบบสอบถามออนไลน์
(http://kwiksurveys.com?s=LHJJKF_a44dba18) การมีส่วนร่วมในโครงการวิจัยคุณูปการ
ครั้งนี้ เป็นไปด้วยความสมัครใจ โดยก่อนที่จะตอบแบบสอบถามนี้ ท่านจะได้รับการร้องขอ
ให้อ่านและยอมรับ ตามหนังสือแสดงความจำนงในการมีส่วนร่วมในการวิจัย ท่านอาจ
ใช้เวลาประมาณ 15 ถึง 20 นาที ในการตอบแบบสอบถามออนไลน์นี้ ข้าพเจ้าขอขอบคุณ
ในการมีส่วนร่วมในการตอบแบบสอบถามของท่าน และข้าพเจ้ายินดีที่จะเปิดเผยและ
แลกเปลี่ยนความคิดเห็นต่อท่านเกี่ยวกับผลการวิจัยครั้งนี้

หากท่านมีข้อสงสัยประการใด โปรดติดต่อข้าพเจ้าผ่านจดหมายอิเล็กทรอนิกส์
ต่อไปนี้ bs0142@unt.edu ข้าพเจ้าขอขอบคุณในความอนุเคราะห์ของท่านมา ณ ที่นี้

ขอแสดงความนับถือ

บัญชา สำรวัยริน
นักศึกษาระดับปริญญาเอก
ภาควิชาเทคโนโลยีแห่งการเรียนรู้

APPENDIX D
INSTRUMENTS

Preview Mode:

[Show](#)

Self-Regulated Learning Characteristics of Online Learning Course Completers VS Non-Completers in Thailand

Self-Regulated Learning Characteristics of Online Learning Course Completers VS Non-Completers in Thailand

(ลักษณะเฉพาะของการทำกับตนเองในการเรียนรู้ของผู้เรียนรายวิชาออนไลน์ในประเทศไทย เปรียบเทียบระหว่างผู้เรียนที่สำเร็จตามหลักสูตรกับผู้เรียนที่ไม่สำเร็จตามหลักสูตร)

By..Buncha Samruayruen and Prof. Dr. Gerald A. Knezek, Learning Technologies, University of North Texas, USA,

(โดย.. บัญชา สำรวัยรุ่น และ ศาสตราจารย์ ดร. เจอรัลด์ เอ. คเนซЕК, ภาควิชาเทคโนโลยีแห่งการเรียนรู้ มหาวิทยาลัยเท็กซัสตอนเหนือ ประเทศสหรัฐอเมริกา)

In part 2 of this survey, the questionnaire was adapted from the Modified MSLQ, which originated by Pintrich & De Groot (1993), and modified by Artino & McCoach (2008)

(ในตอนที่ 2 ของแบบสอบถามนี้ ได้มีการประยุกต์ข้อความมาจากแบบสอบถามวัดกลยุทธแห่งแรงบันดาลใจในการเรียนรู้ ฉบับปรับปรุง The Modified MSLQ ซึ่งคิดค้นโดย ฟินทริช และ เดกรูท เมื่อปี ค.ศ. 1993 และปรับปรุงโดย ฮาคีโน และ แม็คโคช เมื่อปี ค.ศ. 2008)

35%

* IRB Consent Form

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I do hereby consent to participate in this research study being conducted at the University of North Texas. I understand that the investigators are working to find out how Thai online learners feel about their implementation of self-regulated learning in online learning environments.

I understand that participation in this study is completely voluntary, and by participating, I have agreed to the conditions contained in this release. I acknowledge that about 15-20 minutes of time is needed to complete the survey. I acknowledge that I have the right to skip any question I choose not to answer. I also know that there are no foreseeable risks involved in this study; however, if I decide to withdraw my participation, I may do so at any time by simply leaving the web site. My decision to participate or to withdraw from the study will have no effect on my standing in this course or my course grade.

I understand that all research records will be kept confidential by the principal investigator. No individual responses will be disclosed to anyone because all data will be reported on a group basis. If I have questions about this study, I am to contact the

Principal Investigator, Dr. Gerard A. Kliezek, and Co-Investigator, Mr. Darcia Samruayruen, at (940) 565-4195 in the Learning Technologies Department, UNT, US.

By completing the survey, I am confirming that I am at least 18 years old and giving informed consent to participate in this study.

This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

If you agree to participate, you may print this document for your records.

หนังสือแสดงความยินยอมร่วมในโครงการวิจัย (IRB Consent Form)

ลักษณะเฉพาะของการกำกับตนเองในการเรียนรู้ของผู้เรียนรายวิชาออนไลน์ในประเทศไทย เปรียบเทียบระหว่างผู้เรียนที่สำเร็จตามหลักสูตรกับผู้เรียนที่ไม่สำเร็จตามหลักสูตร

โดยนัยแห่งหนังสือฉบับนี้ ข้าพเจ้ายินยอมสมัครใจเข้าร่วมในโครงการวิจัย ซึ่งจัดทำขึ้น ณ มหาวิทยาลัยเท็กซัสตอนเหนือ ข้าพเจ้าเข้าใจดีว่าคณะผู้วิจัยกำลังศึกษาค้นคว้าเพื่อทราบถึง ลักษณะเฉพาะของการกำกับตนเองในการเรียนรู้ของผู้เรียนรายวิชาออนไลน์ในประเทศไทย เปรียบเทียบระหว่างผู้ที่สำเร็จตามหลักสูตรกับผู้เรียนที่ไม่สำเร็จตามหลักสูตร

ข้าพเจ้าเข้าใจดีว่า การเข้าร่วมการวิจัยนี้ เป็นการยินยอมเข้าร่วมการวิจัยด้วยความ สมัครใจ และ โดยการเข้าร่วมการวิจัยนี้ ข้าพเจ้าเห็นด้วยกับเงื่อนไขที่บันทึก อยู่ในโครงการวิจัยนี้ ข้าพเจ้าทราบดีว่า ต้องใช้เวลาประมาณ 15-20 นาทีในการตอบแบบสอบถาม และข้าพเจ้า ทราบดีว่าการวิจัยครั้งนี้ไม่มี ความเสี่ยงใด ๆ ที่จะเกิดขึ้นกับ ข้าพเจ้าในอนาคต ข้าพเจ้ามีสิทธิ์ ที่จะละเว้นการตอบแบบสอบถามข้อใด ๆ ก็ได้ และสามารถถอนตัวออกจากการวิจัยครั้งนี้ เมื่อใดก็ได้ การตัดสินใจของข้าพเจ้าในการเข้าร่วม การวิจัยหรือถอนตัวจากการวิจัยจะไม่มีผล กระทบใด ๆ ต่อการเรียนหรือผลคะแนน ของรายวิชาที่ ข้าพเจ้ากำลังศึกษาอยู่ขณะนี้

ข้าพเจ้าเข้าใจดีว่าประธานคณะผู้วิจัยจะเก็บรักษาข้อมูลทั้งหมดที่ได้จากการวิจัยในครั้งนี้ อย่าง เป็นความลับ ไม่มีการเปิดเผยข้อมูลส่วนบุคคลของผู้ตอบแบบสอบถามต่อบุคคลใด เนื่องจาก ข้อมูลที่ ได้ทั้งหมดจะถูกนำเสนอรายงานในเชิงกลุ่มภาพรวมของผลการวิจัย หากข้าพเจ้ามีคำถาม เกี่ยวกับการ ศึกษาวิจัยในครั้งนี้ ข้าพเจ้าจะติดต่อประธานคณะผู้วิจัยคือ ดร. เจอรัลด์ เอ. คเนซเซค และผู้ร่วมวิจัยคือ นายบัญชา สำรวอร์น แห่งคณะเทคโนโลยีแห่งการศึกษามหาวิทยาลัยเท็กซัส ตอนเหนือ ประเทศ สหรัฐอเมริกา หมายเลขโทรศัพท์ 011-1-940-565-5195

โดยการตอบแบบสอบถามครั้งนี้ ข้าพเจ้ายืนยันว่า ข้าพเจ้ามีอายุเกิน 18 ปี และยินยอม สมัครใจ เข้าร่วมในการวิจัยครั้งนี้

โครงการวิจัยนี้ ได้ผ่านการพิจารณาและอนุมัติจากคณะกรรมการพิจารณาโครงการวิจัย (IRB) แห่งสถาบันมหาวิทยาลัยเท็กซัสตอนเหนือแล้ว โดยสามารถติดต่อสอบถามข้อสงสัยใดๆ เกี่ยวกับสิทธิ ของผู้มีส่วนร่วมในการวิจัยได้ที่ หมายเลขโทรศัพท์ 011-1-940-565-3940

หากท่านเห็นด้วยในการเข้าร่วมในการวิจัยครั้งนี้ ท่านอาจพิมพ์สำเนาเอกสารแสดงความ ยินยอมนี้ไว้เป็นหลักฐาน

Agree/ยินยอม

Disagree/ไม่ยินยอม

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SRL in Thai Online Learning (English/Thai version)

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67%

* Please fill in your e-mail address

(โปรดระบุที่อยู่ไปรษณีย์อิเล็กทรอนิกส์ของท่าน)

* Please select your online program that you are taking at this time

(โปรดระบุหลักสูตรที่ท่านกำลังศึกษาออนไลน์อยู่ขณะนี้)

* Gender (เพศ)

Male (ชาย)

Female (หญิง)

[Reset](#)

* Age range. (ระดับอายุ)

18-20

21-25

26-30

31-40

41-50

51-60

61+

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* Marital status. (สถานภาพสมรส)

Single, never-married (โสด, ไม่เคยแต่งงาน) Married (สมรส)

Separated (แยกกันอยู่กับผู้สมรส) Divorced (หย่า)

Widowed (ม่าย)

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* Please mark highest level of education you have completed.

(โปรดระบุระดับการศึกษาสูงสุดที่ท่านสำเร็จการศึกษามาแล้ว)

- Less than high school / dual credit (ต่ำกว่าระดับมัธยมศึกษาตอนปลาย) High School / GE
- Some College (ระดับวิทยาลัย, ปวช.) 2-year College Degree
- 4-year College Degree (BA, BS) (ระดับปริญญาตรี) Master's Degree
- Doctoral Degree (ระดับปริญญาเอก) Professional Degree

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* How long have you been using the Internet before this semester?

(ก่อนถึงภาคเรียนนี้ ท่านเคยใช้อินเทอร์เน็ตมานานเท่าไร?)

- Never (ไม่เคยใช้เลย) less than 1 year (น้อยกว่า 1 ปี)
- 1 to 3 years (1-3 ปี) 3 to 6 years (3-6 ปี)
- more than 6 years (มากกว่า 6 ปี)

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* How many online courses (include hybrid courses) have you taken before this course?

(ก่อนที่จะเรียนรายวิชานี้ ท่านเคยเรียนในรายวิชาที่เป็นแบบออนไลน์ (รวมทั้งแบบผสมผสาน) มาแล้วจำนวนกี่รายวิชา?)

- None (ไม่เคยเรียน) 1 2 3 4 5+

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Kwik **Surveys**



The Interview Questions

- 1) What strategies have you used in order to keep track of tasks, activities, or assignments through online learning?
- 2) How often did you go online to check your course assignments?
- 3) What strategy did you use to help you remember the lessons in the online learning course?
- 4) How did you review the content before taking an exam?
- 5) What did you do when you didn't understand how to do the assignments?
- 6) What kind of online tools did you most often use when you studied online?
- 7) How did you communicate with your online classmates, or between you and instructor?

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