

# SELF-REGULATED LEARNING IN AN ONLINE LEARNING ENVIRONMENT:

## A DESIGN RESEARCH STUDY

by

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(Under the Direction of Thomas C. Reeves)

### ABSTRACT

The past fifteen years witnessed meteoric growth in online learning, opening up numerous educational opportunities for people who otherwise might have little or no access to higher education. Online learning is also changing how people learn through its technological affordances that allow flexibility in place, time, and approaches to learning as well as access to unparalleled resources. However, these characteristics also present challenges for many learners who struggle to understand how to be successful in such environments.

It is a common understanding that strategic, self-regulated learners are capable of utilizing both internal and external resources to optimize their learning experiences and maximize learning gains. With the widespread uptake of online learning in higher education, researchers have started to investigate possible connections between students' self-regulatory learning skills and their online learning experiences.

This educational design research study examined how graduate students with diverse professional and cultural backgrounds reported their deployment of self-regulatory processes and strategies under the influences of the unique characteristics of an online E-Learning Evaluation

course. The study was guided by research questions on students' motivation, self-regulatory processes and strategies, environmental influences, and course support.

Data from multiple sources, including interviews, surveys, quizzes, online discussions, group projects, and course materials, were collected from sixteen students in two iterations of the course. The online course was redesigned based on the findings from the collected data over these two course iterations while at the same time the aforementioned questions concerning self-regulated learning were investigated.

The results indicated that the students had mostly positive motivational beliefs and used a variety of motivational strategies to self-adjust in face of motivation changes during the course; students also applied various self-regulated learning strategies in meeting challenges inherent in the course; the contextual elements in the course impacted the students' self-regulation in many ways; and revisions to course design appeared to improve the students' learning experience from one iteration to another. Ten principles to guide online course design emerged from the overall educational design research effort, and implications for future research in online self-regulation were identified.

**INDEX WORDS:** self-regulated learning, online learning environment, design research, online course, adult learners, authentic tasks, higher education

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DEDICATION

To my parents, my husband, Yong, and my son, Brayden.

For their enormous love, understanding and support.

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## CHAPTER 1

### INTRODUCTION

#### **Background for the Study**

The burgeoning of online learning has been prevalent not only in American postsecondary institutions but also in the military and corporate sector (Artino, 2008). Obviously, the Internet has become one of the most preferred technologies for learning and teaching at a distance (Dabbagh & Bannan-Ritland, 2005). The merits of online learning stem from the facts that it provides education opportunities to a wider audience, which may have no access otherwise, and it allows students to learn with greater flexibility in time, place, and ways of study. For example, Drennan, Kennedy, and Pisarski (2005) identified the two key attributes of positive student attitudes toward online learning as ease of access and use of online learning materials and accommodation for autonomous learning styles. These inherent advantages of Internet technology, coupled with the constant needs for continuing education of adult learners (Merriam, Caffarella, & Baumgartner, 2007), have rendered online education a pervasive element of current educational practice.

Nevertheless, unbridled optimism for online education should be checked, as various problems related to learning via the web have not been resolved. First of all, fully online courses maintain a higher attrition rate in comparison with traditional campus courses (Clark, 2003; Tyler-Smith, 2006). For various reasons, more online learners, especially novices, either dropped out, withdrew from their courses or left them incomplete. This phenomenon has occurred across disciplines. Also, in some cases, online postsecondary students have reported less satisfaction

with fully online courses than with traditional ones (Sikora & Carroll, 2002). In addition, the quality of online instruction has been found to be only as good as its face-to-face counterparts in most comparative studies (Zhao, Lei, Yan, Tan, & Lai, 2005; Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Liu, 2006). Not surprisingly, the value and legitimacy of online education remains a question for many faculty members regardless of the fact that online delivery of instruction continues to penetrate into all types of higher education institutions (Allen & Seaman, 2005). These interwoven issues continue to keep online education from reaching its full potential while more and more people participate in this form of learning.

To tackle the aforementioned complex issues requires enormous and systematic efforts. One helpful way to improve the effectiveness of online education is through understanding learners' experiences. There is no doubt that learners experience various levels of success and satisfaction when studying in the same or similar online environments, not to mention in different types of web-based environments. Hartley and Bendixen (2001) suggested that researchers pay attention to learners' individual characteristics in relationship with their learning experiences in technology-based environments. The self-regulatory skills of online learners is one of the key areas to investigate (Hartley & Bendixen, 2001), and its importance has been endorsed by several other scholars (Bandura, 1997; Dillon & Greene, 2003; Hill & Hannafin, 1997). Further, the Sloan Consortium surveys of three consecutive years indicated that students' need more discipline in self-regulating their learning efforts in order to succeed in online courses (Allen & Seaman, 2005, 2006, 2007).

Of course, self-regulated learning is a multifaceted concept and entails far more than simply self-discipline. While consciously controlling their own learning behaviors, self-regulated learners are constantly managing and adjusting their motivational, cognitive, and metacognitive

states in order to attain certain goals associated with their academic tasks (Zimmerman, 1986). More importantly, some scholars believe that students with better self-regulated behaviors are more likely to transfer knowledge and skills learned in immediate instructional settings to future situations, leading to better long-term learning results (Driscoll, 2005; Mayer, 2002). The concept and theories of SRL were first developed through observation of learning scenarios in traditional classrooms for the purpose of helping low-achieving K-12 students improve academic performance (Corno & Mandinach, 1983; Zimmerman, 1986; Zimmerman & Schunk, 1989). The abilities and skills to self-regulate one's learning process were later found desirable for learners of various ages and status such as college and postgraduate students, professionals, and other adult learners (e.g., Dobrovolny, 2006; Ley & Young, 1998, 2001; Pintrich, 1995). As the advances in web-based technology make more modalities available for the distance education of adult learners, self-regulated learning becomes increasingly relevant to how learners control the way they learn in non-traditional environments and the roles SRL strategies may play in affecting the level of success and satisfaction they experience in online learning.

During the past fifteen years, emerging research about SRL in technology-enhanced learning environments and in web-based ones in particular has shown a growing interest in exploring the aforementioned connections (Dabbagh, & Kitsantas, 2005). However, although student performance in distance classes has attracted attention from many researchers and practitioners, the literature focusing on learners' SRL in online course environments remains limited. Given the importance of assisting adult learners to succeed in distance courses, I conducted a dissertation study that investigated individuals' SRL in a specific learning context and how an enhanced understanding of SRL can support the design of appropriate learning

support. For this study, I used an educational design research approach (Van den Akker, Gravemeijer, McKenney, & Nieveen, 2006).

### **Context of the Study**

The context of this research study was a graduate course focused on E-Learning Evaluation provided online by the College of Education at a large southeastern university in the USA. This research effort was supported by the course instructor with the hope of effectively redesigning the course for an online learning context to meet the needs of more geographically dispersed learners after its successful implementation in a traditional face-to-face format for 15 years. The course goal was to develop students' understanding and application of evaluation theories, tools, and techniques through authentic learning tasks. The students were required to conduct a real-life evaluation project for a client in a group of 2-4 people. The main course deliverables included an evaluation plan and a final evaluation report with recommendations for clients. In addition to the overarching evaluation project, the students needed to complete weekly course readings representing several sources, view narrated PowerPoint presentations from the instructor, participate in weekly online discussions, and take three quizzes throughout the semester. The course was designed, developed and implemented online from Spring 2008 to Fall 2009. A total of 33 students from the host institution and other institutions all over the world enrolled in the course over its three iterations.

The study was conducted as a design-based research project with dual goals: (1) to extend the investigation in self-regulation by examining the influences of motivation and context on graduate students' self-regulatory processes and strategies, and (2) to derive empirically tested principles for design and implementation of online courses. Data were collected from multiple sources from 2008 to 2009, including three student interviews each semester, a final formal

interview with the instructor, several surveys administered at various points of the semester, online discussion postings, course deliverables, quizzes, and my observation notes. The dissertation results are reported based from the analysis of the first and second iterations.

### **Chapter Overviews**

This dissertation includes three ready to publish articles for three refereed journals plus additional material about the methodology and findings for the study:

- A paper titled “Self-regulated Learning in Online Environments: A Conceptual Framework” as presented in Chapter 2
- A paper titled “Designing an Online Environment to Support Adults Learning Evaluation by Enhancing Self-Regulation” as presented in Chapter 3
- A paper titled “Supporting Online Self-regulation through Course Design, Modeling, and Facilitation” as presented in Chapter 5

In addition to drafts for the aforementioned papers, Chapter 4 encompasses the Methodology and Findings chapter of a traditional dissertation. This chapter delineates the purpose of the study, the overall research design and specific design research procedures for this project, data collection and analysis procedures, findings from the first and second iteration, as well as a general discussion and implications for future research. Due to the length of this chapter and similarities between the second and third iteration findings, the findings from the third iteration were not included.

The first paper, *Self-regulated Learning in Online Environments: A Literature Review and Conceptual Model*, aims to conceptualize self-regulated learning in online course environments. The paper starts with a brief review of self-regulated learning, including a definition, a comparison with self-directed learning, and theoretical foundations and key models of self-

regulated learning. It continues with a discussion of self-regulated learning within the online learning context in higher education. Then, the paper identifies a need for a new model for studying self-regulated learning of adult learners in higher education and presents such a model based on an in-depth literature review. The paper concludes with implications for future research in online self-regulated learning in higher education.

The second paper, *Designing an Online Environment to Support Adults Learning Evaluation by Enhancing Self-Regulation*, first discusses the challenges of learning evaluation. Next, it uses a summary of adult learners' characteristics to investigate the advantages adults have in mastering evaluation skills. The paper then suggests opportunities for providing evaluation education online and enumerates the challenges associated with self-regulated learning. The paper draws on a brief description of SRL, its relationship with learning environments, and a summary of guidelines for enhancing online SRL. Finally, the paper presents the design and development of an online environment that supports adults' learning of evaluation by enhancing their self-regulation and concludes with a collection of design principles for creating self-regulation supportive online environments.

The following chapter, *Methodology, Findings, and Discussion*, summarizes the overall research project process and presents the findings from two iterations of course design, implementation and research. The results indicated that the students in the study actively used a variety of self-regulatory processes and strategies under the influences of their motivational beliefs and the course contextual factors in their efforts to achieve personal goals for taking the E-Learning Evaluation course that features authentic tasks and collaborative group work. The design effort in supporting the students' self-regulation resulted in ten design principles and

twenty four associated strategies for developing online courses that promote self-regulatory processes and strategy use among learners.

The third paper, *Supporting Self-Regulated Learning Online through Course Design, Modeling and Facilitation*, provides a practical example to instructors and instructional designers who want to support student learning through enhancing students' self-regulation in web-based course environments. This paper starts with an introduction of self-regulation and characterization of self-regulated learners, continues to discuss self-regulated learning with online learning as well as self-regulation and modeling, and then presents the case of the design research project, highlighting how the instructor supported students' self-regulation through specific course design, modeling and facilitation strategies. The paper concludes with three general principles that can be utilized to create an optimal online learning environment that promotes self-regulation.

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CHAPTER 2  
SELF-REGULATED LEARNING IN ONLINE ENVIRONMENTS: A LITERATURE  
REVIEW AND CONCEPTUAL MODEL<sup>1</sup>

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## Abstract

Beginning over a quarter century ago, self-regulated learning (SRL) has been identified as an important concept in educational psychologists' attempts to understand learners' conscious control of their mental processes when working to achieve academic goals in traditional classrooms (Zimmerman, 1986, 1990). As web-based learning has provided more and more opportunities for learners to access and engage with meaningful content, educational researchers have examined the bidirectional relationship between interactive learning environments and SRL, singling out the importance of self-regulatory skills for success in distance learning. However, almost all previous studies and the models that emerged from them were proposed based on the theoretical underpinnings of traditional face-to-face classroom situations. The unique characteristics of online learning environments in light of SRL theory remain inadequately understood, and thus there is insufficient guidance for both practice and further research. The purpose of this paper is to introduce an enhanced conceptual model for understanding self-regulated learning in online course contexts based on an overview of the concept of SRL, a delineation of several selected SRL theoretical models, a comparison of SRL and self-directed learning, and an examination of online SRL in higher education as well existing SRL online models.

## Introduction

Over the past two and a half decades, self-regulated learning (SRL) has emerged as an important construct closely associated with student academic achievement (Zimmerman, 1986; Zimmerman & Schunk, 2001). Self-regulated learners are commonly conceptualized as metacognitively, motivationally, and behaviorally active participants in their own learning (Boekaerts & Niemivirta, 2000; Corno, 2001; Winne, 2001; Zimmerman, 1986). Expert learners who are autonomous, strategic, reflective and resourceful (Ertmer & Newby, 1996; Wolters, 2003) not only possess cognitive knowledge but also understand how to take control of their learning through strategy use, self-monitoring, and evaluation (Butler & Winne, 1995; Corno, 1986). In addition, these learners are capable of continually adjusting strategies and altering their behaviors when feedback indicates such a need. They also make efforts to maximally enhance their learning by escaping from distractions, implementing concrete learning plans (Corno, 1993, 2001), and actively engaging with tasks (Winne & Hadwin, 1998) and external environments (Zimmerman, 2001).

Even though self-regulated learning theories emerged from research conducted primarily in traditional classrooms, these theories are by no means irrelevant in today's increasingly prevalent web-based learning environments. The advances of web technology have both afforded new opportunities for altering learning conditions according to the needs of individual learners and allowed for new patterns of interactions to support learning. Of course, new technologies do not guarantee improved learning outcomes (Jonassan & Reeves, 1996); they primarily serve as vehicles for enabling effective learning interactions. How students approach the learning task, use strategies and resources, process information, and sustain their motivation largely influences their quality of learning in web-based environments (Hill & Hannafin, 1997; Kinzie & Berdel,

1990; McManus, 2000; Paulsen & Feldman, 2007). As Brooks (1997) argued, “You can’t place your materials on the WWW if your candidate students are not self-regulating and hope for success” (p. 135). McLoughlin and Hollingworth (2001) contended that a major challenge for educational technologies has been and remains how to move beyond simply providing information access to the process of engendering metacognition and SRL strategy use.

In the meantime, leading researchers in the field of self-regulated learning have acknowledged the bidirectional relationship between learning environments and SRL, singling out the importance of self-regulatory skills for success in distance learning (Boekaerts, 1999; Schunk & Zimmerman, 1998). Previous research centers largely on the use of SRL in a range of computer environments including cognitive tools, intelligent tutoring systems, hypermedia, microworlds, web-based learning systems, etc. (cf., Azevedo & Cromley, 2004; Azevedo, Cromley, & Seibert, 2004; Eom, & Reiser, 2000; Kauffman, 2004; Kramarski, & Gutman, 2006). Research on self-regulatory skills and strategies specifically in online learning environments is still somewhat limited in both quantity and scope. As described below, Whipp and Chiarelli (2004) investigated student use of SRL strategies as well as the motivational and environmental influences on strategy use in a web-based course. A few other researchers have also paid considerable attention to scaffolding student SRL processes through the use of web-based pedagogical tools in online course contexts (Dabbagh & Kitsantas, 2004; Kauffman, 2002; Niemi, Nergi, & Virtanen, 2003). But previous scholarly inquiries into SRL in online learning have been focused on a few discrete aspects of the phenomenon. The lack of a global view has hampered development of more comprehensive and productive understanding of how individual learners regulate their online learning experiences.

This paper first provides an overview of self-regulated learning and a delineation of a few selected theoretical models of SRL. A comparison of SRL and self-directed learning is then presented to deepen understanding of SRL. This paper continues to examine online SRL in higher education and an existing model to study online SRL. Lastly, an enhanced conceptual model for understanding this phenomenon in online course contexts is proposed.

### **The Concept of SRL**

To scholars and researchers with dissimilar perspectives, SRL has different meanings in different situations (cf. Boekaerts, Pintrich, & Zeidner, 2000; Zimmerman & Schunk, 2001). Pintrich (2000) defined academic self-regulation 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). In some other situations, SRL refers to the self-regulatory strategies students use to regulate their cognition and control their learning (Pintrich, 1999). A commonly accepted definition by Zimmerman and Schunk (1989) maintains that SRL are students’ self-generated thoughts, feelings, and actions that are systematically oriented toward attainment of their goals.

Regardless of the varieties of theoretical orientations and other factors that have contributed to divergent definitions of SRL, the three central elements of any SRL definition are learning episodes, self-set learning goals, and goal processes (Boekaerts, 1999). Zimmerman (1990) also summarized three common features of most SRL definitions: (1) systematic use of metacognitive, motivational, and/or behavioral strategies; (2) a cyclic feedback loop whereby students monitor the effectiveness of their learning methods or strategies and react to this

feedback; and (3) an indication of how and why students choose to use a particular strategy or response.

The concept and theories of SRL were first developed through observation of learning scenarios in traditional classrooms for the purpose of helping low-achieving K-12 students improve academic performance (Corno & Mandinach, 1983; Zimmerman, 1986; Zimmerman & Schunk, 1989). SRL literature based on traditional classrooms has yielded a number of key findings about this phenomenon. First, SRL is clearly correlated with cognitive strategy use. Effective students are found to use key strategies including elaboration, inference, rehearsal, and organization for reading, mathematics, procedural tasks, etc. (Kitsantas, Reiser, & Doster, 2004; Paris & Paris, 2001; Pintrich, 1989; Weinstein & Mayer, 1986). High-achieving students also differ from low-achieving students in use of prior knowledge and working memory (Azevedo, Cromeley, & Seibert, 2004). Metacognitively, students who are aware of their learning processes often use planning, monitoring, regulating, and evaluating as effective strategies (Corno, 1986; Pintrich & De Groot, 1990; Zimmerman & Martinez-Pons, 1986, 1988).

Self-regulated learners also hold positive motivational beliefs that are usually categorized as self-efficacy, task value, and goal orientation. Students who feel more efficacious about their abilities to do well in a class are more likely to use cognitive strategies and become more cognitively involved (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Students perceiving the learning tasks as important or useful for them tend to report higher levels of interest and more use of monitoring and regulating strategies, which in turn positively correlate with their academic performance in that class (Pintrich, Smith, Garcia, & McKeachie, 1993). Further, students who are concerned about learning and have goals related to mastery of tasks use more cognitive and SR strategies and demonstrate better performance.

Students' interactions with environmental variables also impact their self-regulatory learning process and thus their academic performance. For example, parental activities and what teachers say or do are important inducements of children's academic self-regulation (Martinez-Pons, 1996; Perry, VandeKamp, Mercer, & Nordby, 2002). Additionally, effective learners adaptively seek help from other resources in their immediate environment, both human and non-human, which allows them to receive constructive feedback and learn independently (Newman, 2002).

In general, SRL theories hold that learners are capable of using knowledge, skills, strategies, and resources to modify the motivational, cognitive, environmental, and behavioral aspects of their learning (Pintrich, 2004; Zimmerman, 1986, 1989). In order to make this type of learning happen, self-regulated learners are assumed to have strong self-awareness about how they learn, knowing when, where, why and how to apply the right knowledge and actions in various learning situations (Ertmer & Newby, 1996). Moreover, although SRL has a lot to do with controlling cognition, researchers (Corno & Mandinach, 1983; Dresel & Haugwitz, 2005) generally agree that it is not dependent on cognitive abilities but is instead clearly correlated with cognitive strategy use. Zimmerman (1986) further pointed out that self-regulation is not an all-or-none phenomenon. Rather, students are all self-regulating to some degree so that they are cognitively, motivationally, and behaviorally engaged in their own learning. Additionally, SRL is not construed as constant across all contexts. How SRL is impacted by environmental factors and how it is acquired and maintained are also addressed within the different purviews of SRL theories (Zimmerman, 2001).

## Self-Regulated Learning Models

Various researchers have proposed individual models of self-regulated learning that represent relationships among task environments, learners' strategies, and their behavioral, cognitive, metacognitive, affective, and volitional systems (see Boekaerts, Pintrich, & Zeidner, 2000; Zimmerman, 1989, 2000). The next section presents four conceptual SRL models that have been studied or applied in recent research.

### *The Corno-Mandinach Information Processing Model of Self-regulation*

In their seminal writing, Corno and Mandinach (1983) defined SRL as a form of cognitive engagement that bridges the gap between motivation research and learning research. Operating within an information-processing (IP) perspective (Corno, 2001), Corno and Mandinach (1983) conceived SRL as “an effort put forth by students to deepen and manipulate the associative network in content areas, and to monitor and improve that deepening process” (p. 95). They identified five mental processes involved in information processing relevant to SRL.

The first process, *Alertness*, is operationalized as receiving, gathering and tracking stimuli information. *Selectivity* follows, during which learners discriminate among stimuli and sort out relevant information. Next is *connecting*, which includes obtaining familiar knowledge and linking it to incoming information. With the completion of the first three steps, *planning* is enabled so that the learner can put together a working sequence to carry out the task. The last process is called *monitoring* and refers to a series of actions including tracking of stimuli, transformation, rehearsing, and self-checking. These five “small-grained” components make up two general types of information processing— acquisition and transformation (Howard-Rose & Winne, 1993, p. 591). Specifically, alertness and monitoring constitute acquisition and bound the remaining processes as the learner takes in new information from the external environment and

tries to internalize it. Selectivity, connecting, and planning are considered transformational; they all involve processing of old and new information, recalling of existing schemas, and generation of new knowledge.

On this basis, Corno and Mandinach (1983) constructed a quadrant delineating four forms of qualitatively different learning approaches (see Figure 2.1). The two axes within the quadrant are defined as the use of acquisition and transformation processes. A self-regulated learner is characterized by high use of both processes and demonstrates the ideal form of cognitive engagement. A learner with high use of acquisition but low use of transformation shows an engagement form named *resource management*, whereas the opposite situation represents a *task focus*. The least desirable pattern is *recipience*, which indicates a low level in both acquisition and transformation processes usage. Recipience characterizes the passive, unengaged learner.

Figure 2.1

Since the emergence of the Corno-Mandinach IP model, researchers have assumed that a student's propensity to self-regulate is not dependent upon his intellectual ability. Rather, motivational and other influences are important in learning (Corno, 2001). While according the metacognitive components of SRL special status, Corno (1986, 1993, 2001, 2004) gradually shifted her attention to the volitional aspect of self-regulation in classrooms. This line of theoretical research was later developed upon a framework encompassing covert control of metacognition, motivation and emotion, and overt control of task and environment (Corno & Kanfer, 1993; Kuhl, 1984; Panagiotopolous, 1987).

The Corno-Mandinach IP model laid a foundation for some early work that explored the nature of SRL and cognitive engagement among K-12 students. For example, Howard-Rose and

Winne (1993) investigated SRL as both discrete components and as sets of components. They then questioned how SRL should be characterized and how it should be presented. Other related research yielded findings about the factors mediating student cognitive engagement and about measurement of engagement variations (Howard-Rose, 1989; Mandinach, 1984; Mandinach & Corno, 1985; Panagiotopoulos, 1987).

Recently, some researchers have utilized Corno and Mandinach's cognitive engagement theory to understand the learning of postsecondary students in different web-based learning environments. For example, Richardson and Newby (2006) found that program focus, gender, age, and prior experience with online learning all impacted students' learning strategies and motivation in an online course. In another study, students' online searching behaviors fell into the categories described by the Corno-Mandinach model (Roger & Swan, 2001, 2004). This indicates that although its applicability is limited, the model can still be insightfully used to explore cognitive and metacognitive aspects of learning in environments enhanced by modern technology.

#### *The Winne-Hadwin Information Processing Model of Self-regulation*

The Winne-Hadwin self-regulation model was also based on the IP theories that focus on the storage, activation, processing, and retrieval of various forms of information in human memories (see Winne, 2001). In this model, (meta)cognition-related processes and strategies used during learning activities play a central role. Essentially, Winne and Hadwin (1998) viewed SRL as an inherent part of learning; they defined SRL as metacognitively guided behavior that helps students approach a learning task with adaptive cognitive strategies and tactics.

The proposed IP model of SRL (Winne & Hadwin, 1998; Winne & Perry, 2000; Winne, 2001) consists of four recursive stages. *Task definition* is the first stage when a learner develops

perceptions about the task. The second stage involves *goal setting* and *planning* on the learner's part. The following stage concerns actual *enactment* of previously generated strategies and tactics. The last phase refers to a metacognitive process during which the learner makes *adaptations* of studying techniques after an analytical examination of the preceding stages.

Each stage is characterized by a five-facet structure, namely, *conditions*, *operations*, *products*, *evaluations*, and *standards* (COPES) (Winne & Hadwin, 1998; Winne, 2001).

Conditions refer to information concerning task conditions (e.g., resources, cues, time) and the learner's cognitive conditions (e.g., task knowledge, study techniques, domain knowledge, motivation, beliefs, etc.). Operations refers to the cognitive and metacognitive processes that lead to creation of products from new information. Products can be internal (e.g., conceptual change) or external (e.g., a learned overt behavior). Evaluation entails the process of generating internal and external feedback about the products. Standards are the criteria against which products are compared.

Since its emergence, Winne's IP model for SRL has remained unaltered. Despite the skepticism of some scholars, Winne has held firm to his basic research agenda of studying the dominance of cognitive and metacognitive processes in self-regulated learning (see Alexander, 1995; Boekaerts, 1995; Corno, 1995; Pressley, 1995; Schunk, 1995; Zimmerman, 1995). Ironically, his collaborator in developing this model later recognized the interactions between learner and social context and reframed Winne's model as a socio-cultural model of SRL (Hadwin, 2000, as cited in Hadwin, Wozney, & Pontin, 2005).

Nevertheless, Winne and his colleagues have achieved important advancements in terms of developing and applying appropriate methods for exploring the complex, multifaceted nature of SRL. Viewing SRL as both an aptitude and an event (Winne & Hadwin, 1998; Winne, 1997;

Winne & Perry, 2000), Winne and his collaborators employed trace methodology to use observable indicators of learning, such as annotation, to identify covert cognitive activities (Howard-Rose & Winne, 1993; Winne, Hadwin, McNamara, & Chu, 1998; Winne & Jamieson-Noel, 2002). Winne and his colleagues have also made use of technology in their collection of visible evidence by taking advantage of electronic tools such as CoNoteS2 and gStudy (Perry & Winne, 2006; Winne et al., 1998). For example, in one study, CoNotesS2 (a prototype electronic notebook) provides the learners with a number of tools, such as indexing, highlighting, creating notes and glossary, and making links, for studying textbook materials and at the same time presents time-referenced trace evidence for researchers to understand the students' metacognitive monitoring and controlling (Hadwin & Winne, 2001).

Components of the Winne-Hadwin model such as feedback and contextual effects have been supported by empirical research (Howard-Rose & Winne, 1993; Butler & Winne, 1995; Hadwin et al., 2001). Additionally, further research has been conducted within the context of the model to gain insight into the SRL process of undergraduates using traditional or computer-based instructional materials in classroom settings (Hadwin et al., 2004; Winne & Jamieson-Noel, 2003). Another important application of this model involved the development of research methodology (i.e., trace methodology), tools (i.e., software with tracing functions), instruments (i.e., strategic learning questionnaires), and principles for designing software environments for enhancing SRL (Hadwin et al., 2001; Howard-Rose & Winne, 1993; Winne, 2004; Winne & Jamieson-Noel, 2002). These applications were also used in later investigations into SRL with technology-based environments such as hypermedia (see Azevedo, 2005a, 2005b; Winne, 2006).

### *Zimmerman's Social Cognitive Model of Self-regulation*

Zimmerman's (1989, 1990, 2001) social cognitive model of self-regulation is rooted in Bandura's (1986) social cognitive theory, which suggests a triadic reciprocal determinism among personal (i.e., self), behavioral, and environment variables. As a result, Zimmerman's model conceptualizes SRL as a three stage cyclical process that integrates social, contextual, and motivational factors (Zimmerman, 1996, 2000; Lipnevich & Smith, 2007). The three phases (i.e., *forethought*, *performance or volition control*, and *self-reflection*) respectively involve monitoring and modifying of individual's cognitive and affective states, learning behaviors and strategies, and environmental conditions (Puustinen & Pulkkinen, 2001; Zimmerman, 1990).

The *forethought* phase includes a *task analysis* process that involves *goal setting* and *strategic planning* as well as a set of *self-motivation beliefs* ranging from self-efficacy to goal orientations. This is the time when a learner, with a given level of confidence, interest, and expectations, decides upon the goals to be achieved and the ways he should attain those goals. The *performance* phase begins once overt learning behaviors and strategies are executed to fulfill the plan. The learner has to *control* his *self-instruction*, *attention*, *imagery* and *task strategies* while *self-observing* the implementation process by use of *self-recording* and *self-experimentation* techniques. The *reflective* stage encompasses self-monitoring where the student makes judgments about learning outcomes and decides future steps. The learner not only *self-evaluates* how the goals have been achieved but also considers the relationships between his actions and the results (i.e., make *causal attributions*) so that he can adjust his strategies and affective and mental states accordingly. With his perceptions about goal attainment, the learner may demonstrate *defensive* reactions (e.g., giving up on the task) or *adaptive* reactions (e.g., try another strategy), which further influence the *forethought* processes.

Inspired by a comparison among experts' methods of self-regulation across disciplines, Zimmerman (1998) proposed an updated version of the cyclical SRL model which features the presence of monitoring throughout the overall process. The new model is composed of four steps, i.e., goal setting and strategic planning, strategy implementation and monitoring, strategic outcome monitoring, and self-evaluation and monitoring. Task-focused and with an emphasis on the behavioral aspect of SRL, this model does not include motivational and affective elements that are presented in the aforementioned classical model. Specifically suggested for teaching SRL skills "in naturalistic settings" (Zimmerman, 1998, p. 82), this modified model has not been applied as extensively in empirical research.

Numerous empirical studies have tested the robustness and stability of Zimmerman's original SRL model across contexts and populations (e.g., Schunk & Zimmerman, 1998; Zimmerman & Martinez-Pons, 1986, 1988, 1990). The model has also served as a theoretical basis to conceptualize other types of research studies and to develop investigative instruments. For example, the self-regulated learning interview schedule (SRLIS) (Zimmerman & Martinez-Pons, 1986) was developed and used in many later studies to gauge student use of SRL strategies. Since the 1990s, Zimmerman has devoted his work to SRL in specific domains, including writing (Zimmerman & Bandura, 1994), complex motor skills (Zimmerman & Kitsantas, 1997), health (Zimmerman, Bonner, Evans, & Mellins, 1999), and athletics (Cleary & Zimmerman, 2001).

#### *Pintrich's Social Cognitive Framework of Self-Regulation*

Also influenced by the Social Cognitive view of academic self-regulation, Pintrich (2000) construes self-regulated learning 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 in the environment” (p. 453). Pintrich’s model marked the first time that learning context has been incorporated as an indispensable element of learners’ self-regulatory process in a formal definition of SRL. It also further manifested Badura’s stance on environmental variables in mediating the interactions between learner’s personal and behavioral factors.

Building upon Zimmerman’s Social Cognitive SRL model, Pintrich (2000, 2004) proposed a general framework to outline in more detail the various processes and areas of regulation as shown in Table 2.1.

Table 2.1

While keeping Zimmerman’s first (*Forethought*) and last stage (*Self-reflection*) and labeling them as *Forethought, planning, and activation* and *Reaction and reflection*, Pintrich broke Zimmerman’s Performance stage down into two separate stages – *Monitoring* and *Control*. Naturally, as the label shows, the first phase involves goal setting, planning, and activation of perceptions and knowledge of the task, the learning context, and the learner self. The *Monitor* phase centers on various monitoring process where the learner employs self-awareness to keep track of different aspects of the task, the context, and the self. The *Control* phase concerns the actual control efforts to regulate various aspect of learning based on what the learner has perceived about the task, context, or the self during the previous stage. The *Reaction and reflection* phase involves the learner’s thoughts and actions in both the self-evaluation of learning performance as well as the attribution of results to relevant variables. The phases, however, are viewed more as a heuristic to organize thinking and research on SRL rather than as a universal model that applies to every single instance of learning. Not all academic learning follows this model because students may possibly also learn in more unintentional ways without

self-regulating their learning in an explicit manner. Pintrich (2000) also noted that although the four phases represent a general time-ordered sequence, they are not meant to be linearly structured.

The self-regulatory phases are presented as the first column of Pintrich's SRL model, and the first row represents four distinctive areas for self-regulation, namely, cognition, motivation/affect, behavior, and context (Pintrich, 2000, 2004). That is to say, during each of the self-regulation phases, the learner actively engages in activities to control the strategies and state of his cognitive learning by demonstrating certain behaviors under the influences of his motivation, emotions, and the surrounding environment. Specifically, the cognition column, including both content knowledge and strategic knowledge, concerns the different cognitive strategies the learner may use to learn and perform a task as well as the metacognitive strategies individuals may use to control and regulate their learning. The motivation and affect column encompasses the various motivational beliefs about the learner self in relation to the task (e.g., goal orientation, self-efficacy and task value). The behavior column reflects the individual learner's general effort on the task, time and resources management as well as persistence, help seeking, and choice behavior. The context column deals with various aspects of the task environment or cultural context where the learner is situated.

The evolution of Pintrich's SRL model can be traced back to his efforts to identify the relationships between a learner's motivation and learning strategies (Pintrich & DeGroot, 1990) and the ensuing development of a self-report instrument, the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991; Pintrich, Pintrich et al., 1993). Introduced in the 1980s and finalized in 1991, MSLQ consists of motivational strategies of three dimensions: value (goal orientation and task value), expectancy (control beliefs and self-efficacy), and affect

(test anxiety). These learning strategies include cognitive strategies (i.e., rehearsal, elaboration, organization, critical thinking), metacognitive strategies (i.e., planning, monitoring, and regulating) and resource management strategies (i.e., time and study environment, effort, peer learning, and help seeking). Self-regulation was conceptualized as part of the learners' learning process at the time of the instrument development, but was later construed as an overarching, inclusive process that embeds all sorts of learning-associated perceptions, decision-making, activities and strategies when the general model was proposed. Pintrich clearly pointed out that the MSLQ is partially in line with the current conceptual model and thus can be used to assess some components; however, he also indicated the model doesn't represent an instrument capable of measuring all of the components (2004). The MSLQ has been applied to a series of empirical studies across various subject groups and disciplines (e.g., Garcia & Pintrich, 1996; Pintrich et al, 1993; VanderSteop et al., 1996; Wolters & Pintrich, 1998).

### *Summary*

The models discussed above have been conceived from two different perspectives (i.e., Information Processing and Social Cognitive) and emphasize various dimensions, thus promoting discrete strategies and processes for academic success. However, these models hold a shared set of assumptions about learning and regulation: (1) the *active, constructive assumption* posits that learners are active, constructive participants in the learning process; (2) the *potential for control assumption* suggests that learners are capable of monitoring, controlling, and regulating some aspects of their own learning to a certain extent; (3) the *goal, criterion, or standard assumption* indicates the existence of some type of criteria or standards against which the learner compares his learning processes and products; and (4) the *mediator assumption* entails self-regulatory activities as mediators between personal and contextual characteristics and

actual learning performance. In other words, learner, environmental, and other characteristics never exert influences on learning without being filtered through the learner's self-regulation of his cognition, motivation, and behavior (Pintrich, 2000).

These models also share some key constructs. Important elements such as motivation, self-awareness, and environmental factors are included. Three common learning processes found in the models are planning, control, and reflection. Planning involves a series of motivational states, knowledge and perceptions about task, self and context, as well as processes and strategies geared towards establishment of learning goals. Control entails the actual enactment of overt and covert strategies for managing and regulating cognition, emotion, motivation, task, and context. Reflection primarily focuses on self-evaluation of progress towards goals and the consequential self-adjustment of strategies, tactics, and motivation. Monitoring plays a crucial role in the overall learning process and should be seen as an integral part of each subprocess rather than a discrete component. Although the Corno-Mandinach model and the Pintrich model both treat monitoring as a conceptually separate stage, it is difficult to divide them empirically as self-awareness, self-observation, monitoring, and cognitive control seem to take place concurrently in the actual self-regulation process. Finally, the four models are all viewed as cyclical in nature where the subprocesses take place and interact in a non-linear, non-hierarchical fashion.

With a focus on how human memories access, store, and process information, Corno-Mandinach's and Winne-Hardwin's cognitive models of SRL clearly depict the covert processes whereby learners take in information and subsequently transform and internalize it through cognitive and metacognitive strategies and tactics. While these models address, to some extent, motivational factors in terms of deployment of particular metacognitive strategies or tactics, they

do not include social or environmental factors as a mediator for metacognition and achievement (Whipp & Chiarelli, 2004). The social cognitive models, represented by Zimmerman's and Pintrich's SRL models, pay attention to this underemphasized aspect and acknowledge the interrelationships between learner-mediated processes, motivational beliefs, feelings, and factors related to the social and physical environment. They also try to bring out the more overt aspect of self-regulation through inclusion of the behavior dimension while coupling it with the covert motivational/affective aspect of student management of learning. The social cognitive models, the Pintrich model in particular, also emphasize the importance of goals in directing and actualizing the learner's purposeful pursuit of learning outcomes. Overall, the Pintrich model does not represent a significant departure from Zimmerman's conceptualization of SRL. Its major contribution lies in that it (1) explicitly makes interacting with the social context an integral part of the SRL process, (2) enumerates various motivational beliefs (especially goal orientations) and empirically supports the correlation between them and learning strategies, and (3) provides the most comprehensive framework so far to measure possible SRL components/aspects. A comparison of each model's characteristics is summarized in Table 2.2.

Table 2.2

### **Self-Regulated Learning and Self-Directed Learning**

Individual learner's studying processes have long been of interest to scholars in education. Different disciplines have researched how individuals take ownership of their learning and actively leverage personal and environmental resources to affect learning outcomes. Self-regulated learning and self-directed learning (SDL) are often used interchangeably in literature to indicate a learner's autonomy. However, these are two different theories, and important

clarifications about their similarities and differences must be made in order to further theoretical and empirical exploration.

### *The Concept and Tenets of SDL*

As early as the 1970s, prominent adult education scholars had developed a theory of autonomous, independent learners similar to educational psychologists' "self-regulated learners" (Houle, 1988; Knowles, 1975, 1980; Tough, 1971). However, in the eyes of adult educators, these learners were characterized by their independent will and self-directedness in learning in adulthood (Candy, 1991). Their learning was termed self-directed learning (SDL), which refers to "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating goals, identifying human and material resources, choosing and implementing learning strategies and evaluating learning outcomes" (Knowles, 1975, p.18). Although such a description parallels the typical depiction of self-regulated learners developed by psychologists, SDL theories are uniquely based upon a set of assumptions related to the distinctive features of adults as mature learners.

Knowles (1975) explicated the underlying beliefs about self-directed learning in five aspects. Self-directing capacity, the first aspect, grows as human beings mature. Though an essential part of becoming older, it is believed that this capacity isn't gained automatically. Rather, self-direction needs to be nurtured, and the speed of its development varies. The second assumption posits that adult learners' experiences are rich and valuable sources for learning and thus should be meaningfully and optimally used. Thirdly, adults' learning develops from dealing with life tasks and problems. Since life experiences vary from individual to individual, adults usually present different levels of readiness at a given time. Fourthly, adult learners have a natural task- and problem-based learning orientation as opposed to the subject-centered

orientation of instructors. The last assumption indicates that adults' intrinsic motivation is the driving force for learning. Self-fulfillment, personal growth, curiosity, and enjoyment are thought to be the primary reasons for adults to engage in such learning (Caffarella & Merriam, 2000; Knowles, 1975).

Since its emergence, research in SDL has led to substantial developments in both theory and practice, especially within the field of adult education (see Merriam, Caffarella, & Buamgartner, 2007). Regardless of divergence in views and emphases, SDL theories converge on several basic tenets including the active, constructive role of learners, the role of adult educators as facilitators, and the social, contextual, and situational properties of SDL. The first tenet, as manifested in several authors' writings (cf. Brockett & Hiemstra, 1991; Garrison, 1997; Knowles, 1975; Tough, 1971), holds that self-directed learners are the owners of their learning and have control over learning processes. The ownership and responsibility are reflected by the initiative of adults in choosing what to be studied as well as their decisions regarding when and how learning should happen (Lamdin, 1997). In practice, learners have the knowledge and skills (or possess a way to gain such knowledge and skills) to initiate, sustain, monitor, and evaluate independent learning activities (Garrison, 1997; Prawat, 1992; Resnick, 1991). Generally, it is assumed that these learners are able to manage, control, and regulate their external context as well as internal states or processes (Garrison, 1997).

This learner-centered approach naturally entails less control on the part of educators. The instructor or trainer is never indispensable in a self-directed learning endeavor (Moore, 1980), and ideally, he should set the climate and provide resources and support rather than make decisions for the learner (Knowles, 1975; Long, 1990; Merriam et al., 2007). In SDL, the specific goals and responsibilities of learners and educators are the result of mutual negotiation,

and such shared control implies interdependence between the involved parties (Garrison, 1993; Knowles, 1975; Merriam & Caffarella, 1991).

The third tenet concerns the nature of adult learning and the conditions in SDL. In the mind of adult educators, the learner is more than “a cognitive machine” and the learning process more than “the systematic acquisition and storage of information” (Merriam, 2001, p.96). For adult learners, life experience plays a central role in learning, which is viewed as a pursuit for personal meaning (Brookfield, 1984). Thus, in a learning situation SDL usually involves a series of social, contextual, and situational conditions reflected by learner motivation, knowledge, skills, and goals (Brockett & Hiemstra, 1991; Candy, 1991; Garrison, 1997).

#### *Key Constructs of SDL*

Like other major theories, SDL has been conceptualized in various ways and theorized into a number of models (Merriam et al., 2007). Despite the differences in structures and processes, three key constructs— personal autonomy, process management, and contextual influences—represent the major components of these SDL models. Personal autonomy demonstrates the commonly-held belief that self-directed adult learners maintain a state of independence and self-sufficiency (Candy, 1991). Personal autonomy also indicates a learner’s willingness and ability to take responsibility for his own learning and decision-making (Brockett & Hiemstra, 1991). The motivational state of learners is also integral to autonomy and includes goal orientation, expectancy, task motivation, and emotions (Garrison, 1997).

Process management refers to the processes, efforts, resources, and study strategies that learners use to take control of their learning. Typically, learners plan, monitor, and evaluate their learning activities with or without assistance from an instructor. Mainly representative of the behavioral aspect of SDL, process management reflects certain level of cognitive effort and is

often labeled as self-management, self-monitoring, self-instruction, or learner control (e.g., Brockett & Hiemstra, 1991; Candy, 1991; Danis, 1992; Garrison, 1997).

Contextual influences indicate that SDL is bound by social and situational factors (see, for example, Candy, 1991; Long, 1993). Although context is not viewed as an independent construct by all models, many have recognized that SDL is not independent of social influences and situational constraints, such as chance occurrences, institutional policies, and personal life situations (Brockett & Hiemstra, 1991; Candy, 1991; Garrison, 1993). The role of context in self-directed situations is further reflected in learners' efforts to control their external environments and conditions (Garrison, 1997).

#### *A Comparison of SRL and SRL*

The accounts of self-directed and self-regulated learners in educational psychology and adult education as represented in the Information Processing SRL models, the Social Cognitive SRL models and Self-directed Learning models that are briefly discussed in the previous sections manifest the following commonalities:

*The agency of learners in the learning process.* All three views agree on the agentic role of learners in learning, acknowledging that learner initiative, thoughts, and behaviors mediate the learning results (see Candy, 1991; Ertmer & Newby, 1996; Garrison, 1997; Merriam & Caffarella, 1991; Zimmerman & Schunk, 2001). The learners are depicted as self-aware, autonomous individuals who constantly regulate and adjust their learning processes according to internal and external feedback. When a student actively self-regulates or directs his own learning, the instructor serves as a facilitator instead of a controller.

*The two fold property of self-regulated/directed learning.* Educational psychologists see SRL as both a human aptitude that remains relatively stable in certain time periods and a learning

event that is composed of discrete yet interrelated components (Winne & Perry, 2000). Adult educators also describe SDL as a personal attribute as well as a process (Brockett & Hiemstra, 1991; Candy, 1991). The bifurcated definition of SRL/SDL has led both disciplines to create different types of instruments so as to achieve accurate measurements.

*The key self-directing and self-regulatory processes.* A surprising overlap exists between the three disciplines' conceived key processes of SRL/SDL. The importance of performance management in the form of planning, monitoring, and evaluating is espoused by each perspective (see Brockett & Hiemstra, 1991; Candy, 1991; Ertmer & Newby, 1996; Garrison, 1997; Ley & Young, 2001; Zimmerman & Schunk, 2001). Although theories in each field delineate these processes with various levels of detail and emphasis, agreement on these key constructs indicates metacognitive control as an essential part of the overall self-directing, self-regulatory learning process.

Nevertheless, the aforementioned similarities by no means obscure the following important distinctions between SRL and SDL:

(1) General *conceptualization*. SDL is conceived as a form or mode of study (or learning) (Hatcher, 1997), in which learners can choose to engage or not to engage. SRL, in contrast, is viewed as ubiquitous among all learners and integral to the overall learning process regardless of their SRL abilities (Winne, 1995; Zimmerman, 1989). In other words, every learner regulates their learning to some extent. However, not all learners direct their learning activities, nor do they self-direct at all times.

(2) *Theoretical* underpinning. SDL is grounded in humanistic philosophy and is construed of as a goal of adult education, a learning process for personal growth, and a way to meet the emotional and psychological needs (i.e., health and well-being) of individuals

(Caffarella & Merraim, 2000; Candy, 1991). By contrast, SRL is rooted in learning theories that are reflective of different psychological and philosophical views (for example, Bandura, 1986; Powers, 1973; Vygotsky, 1978). SRL therefore mainly focuses on the innate mechanism of learning.

(3) *Goals and scope.* SRL theories aim to develop self-regulated learners (Corno & Randi, 1999), whereas SDL study is pursued for goals beyond learning itself (e.g., to promote personal growth, transformational learning, emancipatory learning and social action) (Merriam et al., 2007). Because of the disciplinary differences, the inclusion of social and political elements in SDL represents a major distinction between the two.

(4) *Settings of study.* SRL has primarily been investigated in formal learning settings such as classrooms and other school-based instructional environments or their equivalents such as web-based courses (cf., Zimmerman & Schunk, 1989). Situated in a lifelong learning framework, SDL involves both the formal and informal learning that take place at school, home, or in the workplace (cf., Piskurich, 1993; Rager, 2003; Roberson & Merriam, 2005). Further, SRL research tends to examine learning scenarios over short periods of time, and many of the empirical studies on SRL were conducted under controlled conditions to yield sound psychological correlations; in contrast, SDL projects may last from hours to years and are often examined within the frame of the learner's lifespan. SDL studies have more often been conducted in naturalist learning settings than SRL studies.

(5) *Models and key components.* Early SDL models are linear but later ones reflect the interactive nature of learning to a greater extent (Merriam et al., 2007). SRL models, however, mostly emphasize their cyclical and recursive nature (Zimmerman & Schunk, 2001). Further,

although SDL and SRL theories propose similar or common elements such as motivation and reflection, differences in their entailed meaning, emphasis, and roles are also discernible.

### **Online SRL for Adult Learners in Higher Education**

Online learning has prospered during the past decade, providing growing learning opportunities to an expanded audience through so called “distributed courses” (Locatis & Weisberge, 1997, p.100). In contrast to traditional courses where learners engage in the many of the same learning activities at the same time and place (e.g., a classroom or a laboratory), online or blended courses are distributed in such a way that some or all of the instructional events occur while learners are physically or temporally separated from each other and the instructor. This allows for more flexible forms of learning to occur through synchronous activities (which take place at the same time but in different places and asynchronous activities (which happen at different times in different places) or via a combination of these venues.

The nature of online learning is considerably advantageous for many people, especially adult learners who are often busy professionals motivated by life experiences and social interactions yet constrained by time, space, resources, and personal relationships (Cahoon, 1998). In addition to increased choices in terms of time and space for learning (Song, Singleton, Hill, & Koh, 2004; Williams & Hellman, 2004), more available time between learning interactions and activities allows students to think deeply and generate thoughtful responses, thus increasing the chances for cognitive and metacognitive reflection (Meyer, 2003; Song et al., 2004). Web-based course management systems (CMS) also help deliver a wealth of learning content and resources for learners.

However, the features of online learning require higher levels of self and resource management (Hantula, 1998; Hill, 2002) as well as knowledge and skills necessary to make

informed choices (Schraw, 1998) and succeed academically. Moreover, online learning also presents a shift in learner roles. While face-to-face instructional settings tend to accord the instructor a directive position (Dettori, Giannetti, & Persico, 2006), it is imperative that online learners need to be more active and responsible for their own learning. Further, the textual nature of most online interactions not only demands considerably more time from both the instructor and the learner, but also requires greater care in order to avoid misunderstanding and miscommunication. As direct monitoring from the instructor is often absent, learners need stronger discipline and more inner drive to complete course tasks. In addition, online learners lack the opportunity to model expected behaviors (Cobb, 2003) and are also more likely to feel social isolation or lack of social presence (Dettori et al., 2006; Dille & Mezack, 1991; Hill, Raven, & Han, 2002; Richardson, 2003). Therefore, successful online learners have to be independent students with the ability to manage both their cognitive and metacognitive aspects as well as their affective, motivational states.

Recent research findings support this extrapolation (cf. Bell, 2006; Cobb, 2003; Wang & Lin, 2007; Willem, Aiello, & Bartolome, 2006) and offer insight into the relationship between motivation and SRL of online students. Generally, the findings about the interrelationships among SRL constructs are in accord with what has been learned about SRL from the classroom settings (e.g., Artino & Stephens, 2006; Chang, 2005; Joo, Bong, & Choi, 2000). Moreover, in some cases, students' self-regulation emerges over the course of online learning (Dell, 2006; Richardson & Newby, 2006), implying the potential of online learning for fostering SRL. Some researchers are interested in finding out the utility of embedded interventions in promoting SRL in online environments (e.g., Anderson, 2006; Niemi, Nevgi, & Virtanen, 2003; Park, 2003; Yang, 2005-2006).

While most of the studies only focused on understanding a specific aspect of online SRL or a particular relationship between SRL variables, Whipp and Chiarelli (2004) successfully explored students' SRL processes in an online course from a holistic view. Online students were found to not only have used but to also have adapted many traditional SRL strategies in ways unique to the web-based learning environment. For example, in addition to planning by using traditional calendars, students logged in the course frequently to check updates and others' responses to postings in order to avoid procrastination. They also planned for online and off-line time to get work done efficiently. As a time-management strategy, some printed reading materials so that they could read whenever they had a chance. Their success in managing the technical and social environment of the course was an important source of motivational influences on SRL strategy use. Further, environmental influences such as instructor and peer support as well as course design play an important role in encouraging use of SRL strategies.

### **A Conceptual Model for Self-Regulated Learning in Online Environments**

Educational psychologists have proposed a number of SRL models from a range of theoretical perspectives to show their understandings of SRL dimensions, processes, and relationships. Some of these models are applied more widely than others. The cognitive models have often been used to guide research studies examining cognitive and metacognitive strategy use with an emphasis on processing of information and academic achievement (e.g., Azevedo, Cromeley, & Seibert, 2004; Azevedo, Guthrie, & Seibert, 2004; Azevedo, & Hadwin, 2005). However, the strict focus on the information-related self-regulatory processes and exclusion of environmental factors has limited the model's utility for investigations into the interplays between contextual influences and academic self-regulation, especially in fast changing online learning environments.

With its emphasis on the role of motivational variables and context in mediating student learning, certain social cognitive models of SRL, and Zimmerman's model in particular, have attracted the attention of scholars in instructional technology for its capacity in guiding inquiry into learning in various online environments. Zimmerman's SRL model has been used to develop online SRL instruments (Steffen, 2006), understand the interrelated components of the SRL process (Van den Boom, Paas, van Merrionboer, & van Gog, 2004; Kitsantas et al., 2004), explore individual or group differences in college students' SRL abilities in online courses (Lee, 2002; Williams & Hellman, 2004), and promote the development of SRL skills through instruction (Anderton, 2006; Yang, 2005-2006). However, with respect to online learning, this SRL model is not without limitations. Although it acknowledges the influences of learning or social contexts on self-regulation (such as task) (Zimmerman & Schunk, 2001), this social cognitive model does not suggest any specific dimensions or elements of these contexts to guide further investigation of external impacts on individuals' learning strategy use. This weakness has led to its inadequacy in accounting for learning processes where collective, collaborative, or distributive activities are involved (Whipp & Chiarelli, 2004).

Having realized a need for theoretical models to guide the study of SRL in increasingly prevalent online environments, Artino (2008) proposed a conceptual model for online self-regulation that significantly reflects Zimmerman's SRL model. Artino's model stresses the importance of understanding how the features of online learning environments influence student strategy use. He argues that (1) these influences occur through environmental features mediating students' self-regulatory perceptions and behaviors, and (2) the relationships between the environment and behaviors are bidirectional. In addition, Artino (2008) views academic emotions (such as enjoyment, hope, boredom and frustration) as part of students' personal perceptions.

Artino's resulting model of SRL thus includes four interacting components: contextual features of the online learning environment, personal perceptions, personal behaviors, and academic outcomes. Despite these advances in conceptualizing online SRL, this model only provides examples of how the contextual features might interact with self-regulatory process without formulating a structure with which to examine the features of online course environments. Moreover, the description of this online model mainly focuses on the contextual features of the online environment and personal perceptions including motivational beliefs and achievement emotions; the discussion of the other two aspects of the model (i.e., personal behaviors and academic outcomes) is very general and brief, leaving the conceived process of individual self-regulation unexplained.

In the following section, a comprehensive social cognitive model is proposed (see Figure 2.2) that attends to the contextual structure of online course environments and encompasses the processes whereby online adult learners regulate their academic strategies and behaviors under the environmental and motivational influences. The model suggests a framework consisting of preconditions, processes, and outcomes. The preconditions represent a series of learner characteristics that students bring to an online environment. The processes show how individual students control their learning within the course context by deploying cognitive, metacognitive, and motivational strategies. Students' perceptions about their motivational and emotional states as well as the online context play a critical role in triggering specific self-regulatory strategies and behaviors. The outcomes of students' activities in the course include both task outcomes (which are often evident in the form of tests, papers, projects, etc.) and actual learning that often cannot be easily or accurately measured.

Figure 2.2

### *Learner Characteristics*

While the demand for more flexible access to higher education and the affordances of new technologies have propelled institutions to launch courses online, the effectiveness of such courses has often been measured at the organizational level (see Allen & Seaman, 2005, 2006, 2007), at times overlooking needs at the individual level (Whipp & Chiarelli, 2004). However, understanding learners is crucial for offering meaningful experiences for them. Learners' unique personal traits contribute to successes in online classrooms, and the need to study learner characteristics and their relationships with SRL has been recognized (Hartley & Bendixen, 2001).

Research has shown that students' learning strategy use in online environments is affected by a collection of factors, including age, gender, motivation, prior knowledge and skills, and strategy use (Lee, 2002; Hannafin, Hill, Oliver, Glazer, & Sharma, 2003; Richardson & Newby, 2006; Whipp & Chiarelli, 2004; Williams & Hellman, 2004). For example, gender plays a role in learners' perceptions about online learning environments (Sullivan, 2001), strategy use, and the way they interact with content and each other (Lee, 2002). However, a more recent study of online students in Turkey did not find significant differences in motivational beliefs, self-regulated learning variables, and achievement between male and female students (Yukselturk & Bulut, 2009). These contradictory findings show a need to examine gender as a mediating factor in different learning environments and how it might impact student behaviors and learning results.

Moreover, technical knowledge and experience directly correlate with successful handling of computer environments (Hill & Hannafin, 1997). In addition, personality and learning preferences have been shown to influence the use of CMC systems and learning

strategies (Dewar & Whittington, 2000; Wilson, 2000). As online courses continue to reach a growing and diverse student population, language and culture also impact individuals' learning in various ways (Bembenutty, 2007; Lim, 2004; Purdie & Hattie, 1996; Wang & Reeves, 2007). Lastly, geographic distance may be another factor mediating learner's perceptions about the course and their interaction with peers and instructor, especially when the online course is delivered in a blended mode.

### *Context*

Context plays an important role in mediating learning for two reasons: first, adult learning is viewed as contextualized meaning making (Zepke & Leach, 2002); second, academic self-regulation has also been found to be context and situation dependent (Alexander, 1995; Hadwin et al., 2001; Wolters & Pintrich, 1998; Vanderstoep et al., 1996; Zimmerman, 2001). This proposed online SRL model illustrates context at two different levels— a general or global context, in which the learner and the learning activities are situated, and a formal learning context, within which the actual learning takes place.

The general context impacts learners' SRL through mediation of social, cultural, personal, and technological factors. Specifically, personal factors, such as health conditions or career development, often drive adults to engage in self-directed learning activities (e.g., Rager, 2003; Roberson & Merriam, 2005). Social aspects including family, instructor, and peer influences are also incorporated as one part of SRL research (e.g., Martinez-Pons, 1996; Perry et al., 2002). Cultural factors shape SRL through values, norms, and shared beliefs related to learning (e.g., Purdie, & Hattie, 1996). Technological context not only provides means for online learning but also catalyzes changes in the concept of learning through technological innovations. Development of distance learning and the emergence of various technology-enhanced learning

environments and tools have presented new situations where learner's self-regulation has been substantially affected (see Azevedo, 2005a, 2005b; Garrison, 2003; Song, 2005; Winne, 2006).

In a formal online learning context as presented in Figure 2.2, the environmental factors fall into three categories: instructional, social, and technological. The instructional context impacts self-regulation through learners' interactions with pedagogy, task, structure, choice, resources, and time (Ames, 1992; Butler & Winne, 1995; Perry et al., 2002; Song & Hill, 2007). Such factors and their interactions with the learner in the control process have been an important area of investigation for Instructional Technology researchers and psychologists who are generally more interested in learning processes at a micro level. However, as Goodenow (1992) contended, greater attention should be directed to the social dimensions of learning that encompass self, social support, and group dynamics. Thus, the model suggests researchers carefully examine learners' interactions not only with peers and instructors, but also with other people such as family, clients, and stakeholders when real world projects or endeavors are involved. Furthermore, the online learning environments influence students' learning by their technological affordances. The instructor and students can now communicate and interact in a variety of synchronous and asynchronous ways with the assistance of new technologies, such as discussion forums, email, text or voice chat, synchronous meetings, and web-based collaborative tools. Often these tools are either embedded in Course Management Systems or easily accessible and manageable to learners (e.g., Wiki, Google Office suite applications, etc.) through other software programs.

#### *Self-regulation (control)*

As in many other SRL models, the actual process in which students control their learning by use of cognitive and metacognitive strategies is a central component of this proposed online

SRL model. The learner control is manifested as students' adjustment of behaviors and strategies in response to their perceptions of and interactions with the online learning environments. The learner perceptions consist of motivational beliefs and academic emotions (Artino, 2008); the major self-regulatory subprocesses in an online course include goal setting, planning, enactment of self-generated plans and strategies, monitoring and evaluation of learning processes and tactics, as well as ongoing reflection on learning.

Learners bring various motivational beliefs to the online classroom. Students who feel more efficacious about their abilities in doing well in a class are more likely to use cognitive strategies and become more engaged (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Students perceiving the learning tasks as important or useful for them tend to report higher levels of interest and more use of monitoring and regulating strategies, which in turn positively correlate with their academic performance in that course (Pintrich, Smith, Garcia, & McKeachie, 1993). Further, students who are concerned about learning and have goals related to mastery of tasks use more cognitive and SRL strategies and demonstrate better performance. A study on online graduate students' procrastination has supported these findings by discovering that procrastination increases as intrinsic motivation and effort regulation decrease (Rakes & Dunn, 2010).

Recently, motivation researchers (Linnenbrink & Pintrich, 2004; Pekrun, Goetz, Titz, & Perry, 2002) have also recognized the influence of discrete academic emotions on student engagement and learning. According to Pekrun (2006), positive emotions (e.g., enjoyment and hope) and negative emotions (e.g., boredom and frustration) are partially determined by students' motivational beliefs and impact student learning by mediating their use of strategies, effort

allocation, and persistence. Some of the mechanisms have been supported by evidence from online settings (Artino, 2008).

The actual learning control process (manifested by student behaviors and various learning strategies) follows the conceptualization of Zimmerman's SRL model. The main components are streamlined as goal setting, planning, enacting, monitoring, evaluating, and reflecting. A number of fine-grained elements presented in Zimmerman's model are still applicable but are not within the scope of discussion here. It should be noted that none of the relationships depicted in this online model are linear or unilateral. Instead, the associations between one component or process and another are thought to be reciprocal, which is in keeping with social cognitive theorists' beliefs about the triadic, dynamic interactions of personal factors, behaviors, and environment (Bandura, 1986).

In summary, enactment of self-regulatory processes manifests learner autonomy (Moore, 1972), and is the natural consequence of integration of will and skill (McCombs & Marzano, 1990). Further, learning is contextualized human experience. Therefore, learner attributes (or characteristics), control processes, and learning context are not completely independent dimensions of SRL. Rather, they function concurrently and interact to enable learners to attain established goals in specific online learning environments.

### **Future Research**

The previous sections reflect the effort of both educational psychologists and educational technology researchers to understand students' learning processes under changing learning conditions. However, considering the scale of e-learning in higher education and the hurdles learners have experienced, this effort is still very limited. Thus a thorough understanding of SRL

phenomena in online learning environments has yet to be attained. Based on the foregoing review of research, the following future directions are suggested for inquiries into online SRL.

First, there is a need for more empirical evidence into the relationships between students' SRL, their performance, and their engagement in online learning. There seems to be a tendency to assume the desirability of SRL in online learning without concrete empirical evidence. Much existing research tends to study SRL as a dependent variable and only investigates how it can be supported in online environments. While research in this current direction surely leads to important implications for teaching and learning, deepened knowledge about the effects of SRL on online student learning and how such functioning occurs will not only test the legitimacy of the current research direction but also help push it forward.

Second, attention should be devoted to the interplay between students' specific SRL processes and the online environments where the learning takes place. First, understanding the dynamics of powerful learning environments is crucial for promoting SRL (Boekaerts, 2002). For example, answering the questions of how the motivational process operates and how different social interaction patterns impact student learning strategies will offer insights into design of SRL support (Whipp & Chiarelli, 2004). Ideally, work in this area would couple analytical research that aims to identify causal relations with systematic research that examines the fluid learning process in-situ (Corno, 1995). Second, because online learning contexts are highly diverse and sophisticated, there are large variances in technological features, design principles, tasks, subject contents, social elements, and other aspects of online learning environment structures. Even though some researchers have described the characteristics of technology-enhanced or web-based environments (cf. Kramarski & Gutman, 2004; Azevedo, 2005a, 2005b), their focus on surface features neglects underlying mechanisms or principles.

Some studies also tend to propose future design principles without clarifying current design principles of the learning environments or examining their effects in the first place. To understand online SRL accurately, researchers should avoid such issues and focus more on clarifying underlying relationships between the learning context and SRL processes or strategy use.

Third, longitudinal research on how SRL proficiency in online learning develops over time needs more research. Though several studies reported SRL as an outcome of online learning, they did not fully delineate the evolution process of this ability (e.g., Dell, 2006; Richardson & Newby, 2006). Unlike classroom learning, taking courses completely online or in a blended manner is a totally new experience for some learners. Researching how these learners handle the transition and how they carry the new experience forward to subsequent online learning will offer researchers important insight into what types of support are needed and how support can be incorporated to promote online self-regulatory learning behaviors.

In conclusion, the study of SRL in online learning environments is a rich field with the potential to yield important theoretical and practical implications for improving the quality of online education. To this end, rigorous empirical research based on coherent SRL theoretical frameworks must be initiated to look into the complex interactions among learner characteristics, tasks, and the learning environments as well as the specific processes of online self-regulated learning.

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Figure 2.1  
*Four Forms of Cognitive Engagement from Corno and Mandinach's Model*

Use of Acquisition Process

Use of Transformation		High	Low
	High	Self-Regulated Learning	Task Focus
	Low	Resource management	Recipience

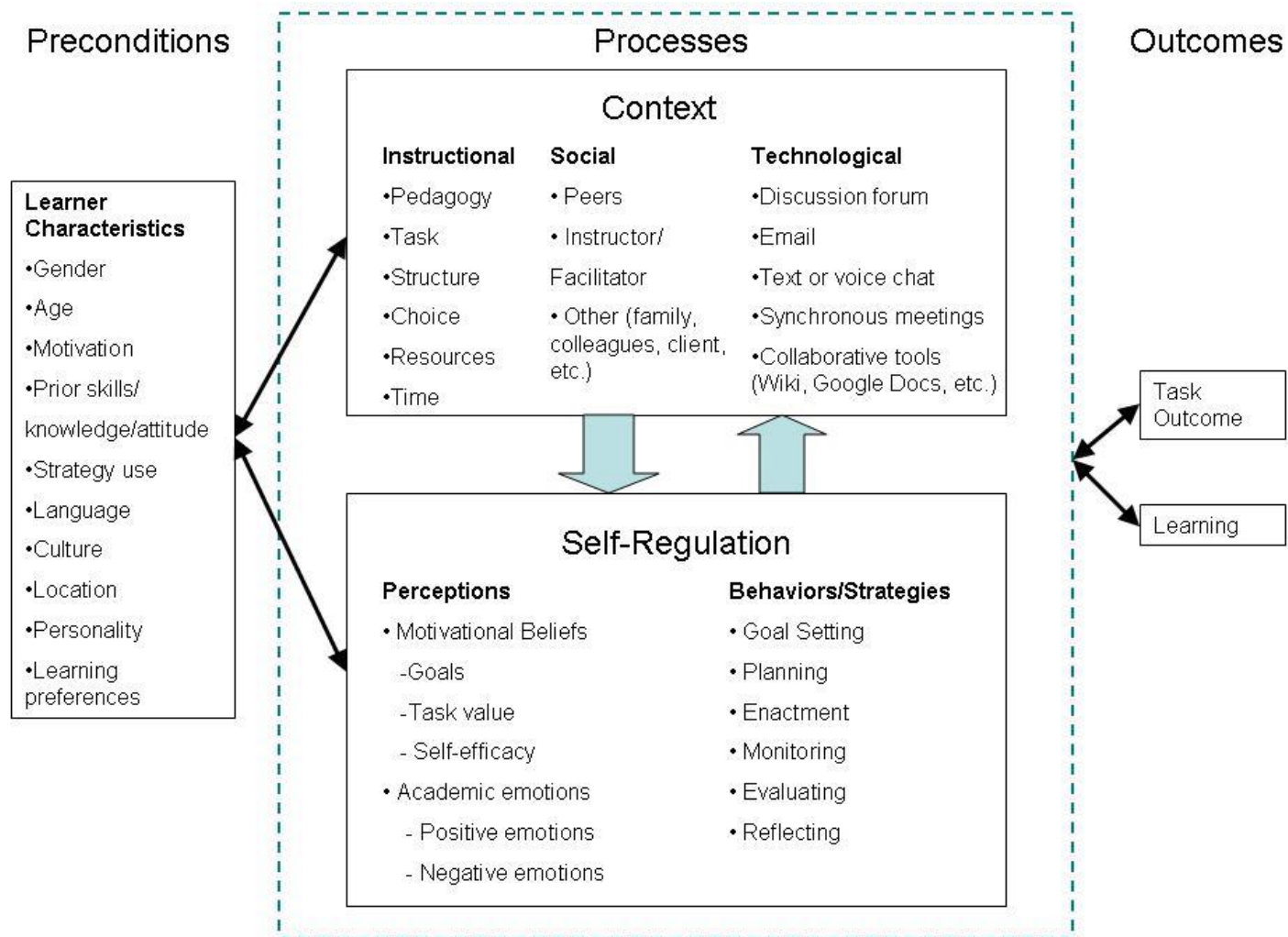
Table 2.1  
*Phases and Areas for Self-Regulated Learning*

Phases	Areas for regulation			
	Cognition	Motivation/Affect	Behavior	Context
1. Forethought, planning, and activation	Target goal setting	Goal orientation adoption	Time and effort planning	Perceptions of task
	Prior content knowledge activation  Metacognitive knowledge activation	Efficacy judgments  Ease of learning judgments; perceptions of task difficulty Task value activation Interest activation	Planning for self-observation of behavior	Perceptions of context
2. Monitoring	Metacognitive awareness and monitoring of cognition	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for help  Self-observation of behavior	Monitoring changing task and context conditions
3. Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing motivation and affect	Increase/decrease effort  Persist, give up Help-seeking behavior	Change or renegotiate task  Change or leave context
4. Reaction and reflection	Cognitive judgments	Affective reactions	Choice behavior	Evaluation of task
	Attributions	Attributions		Evaluation of context

Table 2.2  
*A Comparison of SRL Models*

<b>Author</b>	<b>Corno &amp; Mandinach (1983)</b>	<b>Winne &amp; Hardwin (1998, 2001)</b>	<b>Zimmerman (2001)</b>	<b>Pintrich (2004)</b>
Theoretical perspective	Information processing	Information processing	Social cognitive	Social cognitive
Definition	SRL is an effort put forth by students to deepen and manipulate the associative network in content areas, and to monitor and improve that deepening process.	SRL is a metacognitively guided behavior that helps students approach a learning task with adaptive cognitive strategies and tactics.	SRL are students' self-generated thoughts, feelings, and actions that are systematically oriented toward attainment of their goals.	SRL is 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 in the environment.
Type of model	Recursive	Recursive	Recursive	Recursive
Phases	(1) Alertness, (2) Selectivity, (3) Connecting, (4) Planning, (5) Monitoring.	(1) Task definition, (2) Planning, (3) Enactment, (4) Adaptation.	(1) Forethought, (2) Performance, (3) Self-reflection.	(1) Forethought, planning and activation, (2) Monitoring, (3) Control, (4) Reaction and reflection.
Is motivation considered?	No	Not emphasized	Yes	Yes
Are goals considered?	No	No	Yes	Yes
Is context considered?	No	Not emphasized	Yes	Yes
Unique feature	Includes a quadrant delineating four forms of qualitatively different learning approaches.	Each SRL phase has the same general structure: Conditions, Operations and products, Evaluations, and Standards.	SRL is determined by three interrelated factors: personal, behavioral, and environmental.	Includes a separate context dimension; each SRL phase includes activities concerning cognitive, motivational, behavioral, and context areas.

Figure 2.2  
*A Conceptual Model for Self-Regulation in Online Environments*



Outcomes

Task Outcome

Learning

CHAPTER 3  
DESIGNING AN ONLINE ENVIRONMENT TO SUPPORT ADULTS LEARNING  
EVALUATION BY ENHANCING SELF-REGULATION<sup>1</sup>

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<sup>1</sup> Liu, Y. & Reeves, T. C. To be submitted to *Educational Media International*.

### Abstract

There is a growing, world-wide demand for qualified evaluators. In addition, evaluation education and training are needed to prepare other professionals like instructional designers whose jobs also require strong evaluation skills. Unfortunately, compared with the demand for evaluation expertise, the number of evaluation courses offered at present is inadequate. In addition, the traditional, classroom-based settings of the courses that are offered on higher education campuses limit the access of adult learners who are constrained by schedule, financial situations, and work and life demands. This paper presents an exploratory effort in offering an evaluation course online by an instructor who has taught the same evaluation course in a face-to-face setting for 15 years. Due to the challenges of learning evaluation and distance education, it is imperative to support self-regulation of adult learners during their online learning process. The paper draws on a brief description of SRL, its relationship with learning environments, and a summary of guidelines for enhancing online SRL. Finally, the paper delineates the design and development of an online environment that supports adults' learning of evaluation by enhancing their self-regulation and concludes with a collection of design principles for creating self-regulation supportive online environments.

## Introduction

Evaluation has been a field of sustained interest since World War I (Patton, 2012; Rossi, Lipsey, & Freeman, 2004). The use for evaluation goes beyond ensuring the quality and accountability of public funded programs (Patton, 2012). Due to the widespread use of evaluations in education and other areas, there is a growing, world-wide demand for qualified evaluators (Patton, 2012). In addition, evaluation education and training are needed to prepare other professionals like instructional designers whose jobs also require strong evaluation skills (Dick, Carey, & Carey, 2009). Unfortunately, compared with the demand for the development of evaluation expertise, the number of evaluation courses offered at present is inadequate. In addition, the traditional, classroom-based settings of the courses that are offered on higher education campuses limit the access of adult learners who are constrained by schedule, financial situations, and work and life demands. As online education has become a pervasive form of learning in higher education, the question of how can web-based learning expand its benefits to adults wanting to learn evaluation in more flexible ways has arisen. This paper addresses this question.

The paper first discusses the challenges of learning evaluation. Next, it uses a summary of adult learners' characteristics to investigate the advantages adults have in mastering evaluation skills. The paper then suggests opportunities for providing evaluation education online and enumerates the challenges associated with self-regulated learning (SRL). The paper draws on a brief description of SRL, its relationship with learning environments, and a summary of guidelines for enhancing online SRL, to present the design and development of an online environment that supports adults' learning of evaluation by enhancing their self-regulation.

## Challenges of Learning Evaluation

Although evaluation has been of interest to many people, actually learning evaluation can be a very demanding endeavor. First of all, students need to develop a solid knowledge base of evaluation theory and methodology, which encompass a number of inquiry paradigms, approaches, models, and corresponding data collection methods (see, for example, Patton, 2012; Reeves & Hedberg, 2003; Fitzpatrick, Sanders, & Worthen, 2011). Different approaches and models are based on different, sometimes conflicting, epistemologies and are thus not suitable for evaluating all programs or products. Students have to make sensible choices in terms of models and tools depending on their own goals for conducting the evaluation. To make things more complicated, real-world evaluation projects are often interdisciplinary in nature. This is reflected by Cornbach et al.'s (1980) recommendation for an interdisciplinary format of evaluation training and the recent development and the opening of an interdisciplinary evaluation program at Western Michigan University (WMU) (<http://www.wmich.edu/evalctr/>) modeled after the recommendations of Cornbach and colleagues (Stufflebeam, 2001). Learning to be a competent evaluator presents a high cognitive demand.

Due to its pragmatic nature, evaluation is an application-oriented field. There are no simple recipes for conducting a successful real-life evaluation. Explicit knowledge can be acquired through classroom learning in relatively straightforward ways, but the tacit knowledge critical to the mobilizing the appropriate application of explicit knowledge has to be gained through experience (Hurley, Renger, & Brunk, 2005). Evaluation training often addresses the demand for practical experience by providing opportunities for simulation, role-play, single-course projects, or practicum (Trevisan, 2004).

The experiential component of evaluation learning allows students to integrate conceptual learning and eclectic applications of related skills. It also poses numerous challenges for novices as they lack the expertise to deal with the human factors present in virtually every aspect of evaluation. The utility, feasibility, and propriety standards for evaluation (Joint Committee on Standards for Educational Evaluation, 2011) imply the political characteristic of this intellectual activity. Even though only a few approaches, such as naturalistic evaluation (Guba & Lincoln, 1981, 1989), emphasize the political aspect of evaluative effort, communicating, negotiating, and interacting with clients and other stakeholders requires considerable attention, effort, and strategies of evaluators no matter which specific model or approach is used. In the meantime, collaboration with peers and the instructor is not only commonplace but also indispensable for gaining rewarding experiences, which adds another demand for interpersonal and collaborative skills of students (Hurley, Renger, & Brunk, 2005). Students learning evaluation experientially are also likely to face ethical dilemmas that frustrate even professional evaluators.

### **Adults Learning Evaluation Online**

Adult learners have become an important student group that higher education institutions and learning organizations seek to serve. The learning landscape of the U.S. has been drastically transformed due to shifts in demographics, increased globalization, and new technologies (Merriam, Caffarella, & Baumgartner, 2007). Today's adult learners encompass a far more diverse population in terms of ethnicity, culture, prior education, skills, experience, motives, and learning preferences. Educational researchers and instructional designers alike must pay increasing attention to various learning constraints that inform understanding of adult learning characteristics. All together, as Cahoon (1998) summarized, the characteristics that distinguish adult learners are:

the importance of life experiences and social situations in motivating their learning; their need to apply learning quickly to practical tasks; their ability to pursue self-directed learning; and their struggles to balance learning projects against the constraints of time, space, economic resources, and personal relationships. (p.71)

When it comes to learning complex and pragmatic topics such as evaluation, adults have several advantages in developing meaningful experiences. They are mature, goal-driven, and task-oriented learners (Merriam, et al., 2007), capable of focusing on the most essential aspects of learning to meet their personal and professional needs (Boshier, 1991). Adults not only bring rich educational and life experiences to a learning situation, but they also aspire to transfer what they learn to future work and life situations (Merriam & Brockett, 1997; Merriam, et al., 2007). This warrants the use of certain pedagogical approaches that emphasize the role of experience and real-life contexts; among possible approaches are experiential learning (Kolb, 1984; Jarvis, 1987), situated cognition (Cervero, 1988; Brown, Collins, & Duguid, 1989), and authentic learning (Lebow & Wager, 1994; Herrington, Reeves, & Oliver, 2010). Adults also tend to be self-directive and reflective when they choose to engage in learning activities (Knowles, 1984; Merriam et al., 2007). Because viable evaluations require thoughtful, strategic planning and action (Rose & Devonshire, 2004; Trevisan, 2002, 2004), this characteristic of adult learners can be a huge asset.

Evaluation education is resource intensive (Trevisan, 2004); unfortunately, not all institutions and organizations can afford the resources necessary for students to learn evaluation through practical opportunities. Considering the existing demand for competent evaluators, the development of online evaluation courses by institutions with the appropriate resources may be a promising endeavor. Adult learners can transcend their situational constraints to take the learning opportunities they would not have otherwise. However, the effort in extending access to

evaluation education via e-learning will not be fruitful unless the greater-than-normal challenges associated with learning evaluation online are adequately addressed.

Incorporation of experiential opportunities has been vital for teaching a practical field like evaluation (Darabi, 2002; Kelley & Jones, 1992; Trevisan, 2002, 2004). This has posed many difficulties in replicating the kind of experience gained in face-to-face settings to online classrooms. First, maintaining the types of interactions necessary for conducting a real-life evaluation project online requires a lot of extra work in communication and coordination and therefore can be extremely time consuming. Second, web-based learning and other interactions largely take place based on exchange of text. This may cause information overload and impose additional cognitive demands on learners already cognitively busy with processing content information from a demanding evaluation course. Third, even when studying topics that do not require practical application, online students have to exercise greater discipline and use more adaptive metacognitive strategies to achieve desired learning outcomes than their counterparts in traditional classrooms (Allen & Seaman, 2005, 2006, 2007; Whipp & Chiarelli, 2004). Fourth, lack of direct interpersonal interactions in online classrooms leads to a lack of opportunities for modeling expert behaviors and strategies and sometimes even causes negative feelings and emotions such as isolation. Excessive anxiety has also been reported as part of evaluation project experience (Donaldson, Googler, & Scriven, 2002). This can be a serious problem for learning evaluation in particular. Evaluation courses, especially when practical experiences are involved, requires much mentoring from the instructor and collaboration with peers (Darabi, 2002, 2005; Hurley, Renger, & Brunk, 2005; Levin-Rozalis, & Rosenstein, 2003; Trevisan, 2002, 2004). Although it is not impossible to overcome these hurdles, online learners have to be highly skilled in deploying their cognitive, metacognitive, and motivational resources to perform at a

satisfactory level. In other words, self-regulated learning is critical to maximizing adults' learning of evaluation online.

### **Fostering Online Self-Regulated Learning of Adults**

Self-regulated learning can be best described as the general capacity of students to direct and control their own learning. Theorists consider SRL to be “a complex, super-ordinate set of functions located at the junction of several fields of psychological research” (Boekaerts & Corno, 2005, p.200). SRL involves virtually every aspect of learning, including regulation of motivation, cognition, behavior, and context (Pintrich, 2004). Self-regulated students are active, goal-directed learners who rely on their internal resources to take control of their learning while interacting with the external environment. Though theorists offer multiple definitions of SRL, they nonetheless agree it encompasses several complicated processes: (1) calibrating one's own motivational state, knowledge, skills, tasks, and context, (2) applying cognitive, metacognitive, motivational strategies and resources, (3) monitoring learning process and performance, and (4) evaluating progress and adjusting internal and external conditions (see Zimmerman & Schunk, 2001). Self-awareness is the key enabling element in the overall self-regulatory process.

Self-directed learning, an important theory in the field of adult education, presents similar qualities of learners as it views them as autonomous, self-directed individuals with ownership of and control over their learning processes (e.g., Brockett & Hiemstra, 1991; Garrison, 1997). Self-regulated learning and self-directed learning, although sometimes used in literature interchangeably, refer to two separate strands of theories and are theorized differently. SRL stresses the cognitive, metacognitive, and motivational aspects of learning and delineates the intricate mechanisms; on the other hand, SDL emphasizes the initiative and responsibilities of adults in their learning endeavors. In a particular course context, a SRL perspective can be very

helpful in guiding construction of an optimal learning environment by looking into individuals' micro-level learning processes and strategies.

### *SRL and Learning Environments*

SRL is correlated with the structure of learning environments. Perry and her colleagues (2004) identified distinguishing characteristics of high SRL environments as: (1) use open, complex tasks (Turner, 1995), (2) allow choice about what, who, where, and when (Turner, 1995), (3) provide opportunities to control challenges and self-evaluate (Paris & Paris, 2001), (4) embed instrumental support from the teacher and peers, and (5) employ non-threatening evaluation practices. Empirical evidence also supports the positive relationships between perceived classroom control and self-regulatory strategies (Eshel & Kohavi, 2003). These studies show that learner choice, autonomy and control are the essential features of SRL-supportive learning environments.

In light of this discovery, open-ended learning, with its emphasis on “processes wherein the intents and purposes of the individual are uniquely established and pursued” (Hannafin, Hall, Land, & Hill, 1994, p.48), shows great potential for promoting student self-regulation. In open-ended learning, individual learners, instead of the instructor or learning designer, make decisions about what and how they learn. As a result, the learner's ability to take control of his or her cognitive and metacognitive functioning is a prerequisite for success in open-ended environments (Hannafin & Land, 2000a; Hill & Hannafin, 1997; Salomon, 1986). Therefore, this type of environment encourages, indeed requires, a student's own regulation of the learning process.

### *Enhancing SRL in Open-ended Online Learning Environments*

Open-ended learning environment attributes, such as increased learner control and choice, complex problems, sophisticated systems, and self-direction, also present great challenges to learners (Hanafin & Land, 2000b; Land, 2000), especially those who lack necessary domain knowledge or self-regulated learning strategies, perceive information inaccurately, or feel disorientation and frustration (Hill, 1999; Hill & Hannafin, 1997; Land, 2000). Studying online exacerbates this problem as a lack of classroom authority and complications with technology use put learners in the central role of managing their own learning process and keeping up with course objectives. McLoughlin (2002) contented that scaffolding metacognition is key to resolving the paradox of using open-ended learning environments to promote higher-order thinking of learners who need the necessary knowledge and skills to benefit from web-based education. Table 3.1 presents a collection of researchers' suggested principles for supporting students' learning and metacognition in online and other teaching contexts.

Table 3.1

#### **Designing an SRL-Supportive Learning Environment for Adults Learning Evaluation Online**

A team of designers and researchers in a large research university in the southeastern U.S. explored the current status of evaluation courses in higher education institutions in June 2007. Based on a needs assessment report that drew data from 18 institutions in and outside of the U.S., these designers discovered that (1) there is a need for an evaluation course focused on assessing e-learning because of students' interest in furthering their knowledge and skills in evaluation; (2) the need hasn't been adequately met in the contacted higher education institutions

due to financial, instructional, logistic and administrative limitations. As the needs assessment clearly indicated the need and desire for such a course, the team first set out to find a course suitable for offering in an online fashion. They selected an instructional product evaluation course that had hitherto been successfully offered by a senior professor in a face-to-face mode for 15 years. The design team then initiated an endeavor to transform this traditional course into an online version focused on “E-Learning Evaluation.” The project team’s primary concerns were providing an international audience with ample opportunities for developing the knowledge base and practical experience needed for learning evaluation. This purpose was achieved through creating an online learning environment that integrates two major design considerations: authentic tasks and collaborative group work.

### *Authentic Tasks*

Authentic learning is believed to have multiple benefits for learners, for those in online environments in particular (Lebow & Wager, 1994). Use of real-life, authentic tasks is central to this type of learning and brings meaningful learning experiences to learners who sometimes fail to make connections between academic learning and their lives. Such tasks represent a synergistic view of teaching and learning and have the following distinctive characteristics:

- Authentic tasks have real-world relevance;
- Authentic tasks are ill-defined, requiring students to define the tasks and sub-tasks needed to complete an activity;
- Authentic tasks comprise complex activities to be investigated by students over a sustained period of time;
- Authentic tasks provide the opportunity for students to examine the task from different perspectives, using a variety of resources;
- Authentic tasks provide the opportunity to collaborate;
- Authentic tasks provide the opportunity to reflect;
- Authentic tasks can be integrated and applied across different subject areas and lead beyond domain-specific outcomes;
- Authentic tasks are seamlessly integrated with assessment;

- Authentic tasks create polished products that are valuable in their own right;
- Authentic tasks allow competing solutions and a diversity of outcomes.

(Herrington, Reeves, & Oliver, 2006, p.237)

Teaching evaluation has been an area where the use of authentic tasks as a primary pedagogy is most appropriate. As discussed in the previous section, course projects and practicum experiences have been commonly used in evaluation courses as a major pedagogical strategy (Trevisan, 2004). Even though these learning activities may not meet every criterion listed above, they normally reflect some of the key features as many of them occur under supervision and with consultation of a real client, involve real field work, result in a final evaluation report supported with field data, and require collaboration between multiple people (cf. Darabi, 2002; Hurley, Renger, & Brunk, 2005; Kelley & Jones, 1992; Trevisan, 2004). Like in many courses where students actively engage in problem-solving within realistic situations, this e-learning evaluation course also attempted to build a learning environment to help students gain knowledge and skills that are eventually transferrable and applicable to future workplaces.

#### *Collaborative Group Work*

Conducting evaluation in real life often requires a team effort. Because of the interdisciplinary nature of evaluation projects, people from different professional backgrounds and with varied expertise come together to produce the rigorous work necessary to glean evidence trust-worthy for rational decision making. After assigning projects based on solitary work for years, the course instructor realized the importance of providing learning experiences that mimic the way that instructional product evaluation usually takes place in authentic contexts. A collaborative component thus became a must for this type of experience. Additionally, collaborative groups have long been used as a pedagogical strategy to facilitate content learning (Bruffee, 1999) while online collaboration through modern technologies has furthered this utility

(Han & Hill, 2007). In distance education, collaborative group work also brings about the benefit of helping learners overcome isolation, increasing their satisfaction, and facilitating critical thinking (Brandon & Hollingshead, 1999; Harasim, 2002; McConnell, 2005; Palloff & Pratt, 2005).

However, merely having multiple people work in one group does not necessarily incur real collaboration. Collaboration means more than getting work done. A collaborative group made up of a small number of heterogeneous members (Bruffee, 1999) should share common goals, work interdependently, and construct knowledge through social interactions (Vygotsky, 1978). Members of a truly collaborative team should engage in collective efforts in resolving ill-structured problems (Bruffee, 1999; Graham and Misanchuk, 2004). Facilitating successful online collaborative group work involves strategic use of technological tools to ensure active learner engagement, shared understanding of both tasks and work processes, equal contribution based on individuals' strengths, and fair assessment (Roberts & McInnerney, 2007).

### *Design and Development of the Course*

In developing the course, the course instructor and designers relied on a constructivist view of learning (Jonassen, 1991) and privileged the value of practical experience in learning evaluation. Thus, the course organized its activities around the central, real-life task of evaluating a specific e-Learning product (e.g., a web-based course or an interactive multimedia training module, etc.) for a real client. The overall process included various stages of evaluation including making a plan, implementing it, analyzing findings and reporting the recommendations. The students worked in collaborative groups of 2-4 people. The course had both didactic and practical components: (1) various readings that included both a textbook, a handbook and a number of articles on foundational knowledge of evaluation and practical tools for conducting

evaluation; (2) instructor-led, narrated PowerPoint presentations that synthesized the essential conceptual knowledge, the key aspects of conducting a real project, and the use of given tools; (3) a group project that allowed students to sharpen their practical skills by applying what they learned from books in an authentic context; (4) quizzes that enabled students to synthesize their gained knowledge and apply their analytical skills through answering scenario-based long questions; and (5) case studies that provided the opportunity to deepen understanding through analysis of different scenarios.

The instructor recruited interested graduate students from English-speaking countries by sending out course participation invitations and course descriptions (see Appendix A) through faculty members at a number of institutions. He clearly communicated the course expectations at the very beginning while stressing a voluntary basis for participation. Most of the students eventually enrolled in the course were graduate students of Instructional Technology or similar majors with varying levels of experience with e-learning. They generally entered the course with fairly proficient computer skills, but some were new to this type of online learning environment. For the first round implementation of the course in the spring of 2008, the eight enrolled students hailed from different universities in Australia, South Africa, and USA and exhibited diverse ethnic, cultural, and professional backgrounds. For the second iteration of the course in the fall of the same year, sixteen students located in North America and representing Canada, Korea, Taiwan, and the USA in terms of nationality joined the class.

Due to the geographical distance and the resulting differences in time zones between learners and the instructor, the design team decided to launch the course in an asynchronous mode. Moodle (<http://www.moodle.org>) was chosen as the primary platform to host the course materials and provide a shared space for various types of online interactions among the course

participants. There were two main reasons for this CMS selection: first, Moodle is an open-source course management system available at no cost for every learner with Internet access; second, the system had multiple technological affordances which enabled both the individual learning and group interactions needed for the learners to fulfill the course requirements. With Moodle, the course was structured in the form of a weekly outline as illustrated by the course design version 1.0 in Figure 3.1. The course was operated based on a U.S. university semester schedule with a 16-week plan. During the first iteration of the course, the design team collected data from student interviews, surveys, and instructor interviews to inform the redesign of the course for the following offering.

Figure 3.1

*Redesign and Revisions for the Second Course Iteration*

Based on the findings from the first iteration, several redesign and revisions were made for the second iteration in the areas of course structure, communication, online discussions, course materials, assessment and technology. For example, the course presented an enhanced structure through guided group work, explicit instructor expectations, and a clearer time frame. In terms of the group work, a fellow researcher and course facilitator provided specific guidance by assisting the students to select a group leader and set ground rules. Materials regarding conducting virtual meetings and collaborative editing were added to the week 2 course content. Instead of having one discussion forum for all groups, separate discussion forums for each group were set up to facilitate small group discussions about their projects. The fellow researcher also assisted the groups with arranging weekly team meetings and attended the initial meetings to help them get started. In addition, the instructor deliberately clarified his expectations for students in terms of time commitment, participation and contribution both in the syllabus and

through course news announcements and weekly updates. Another important revision was that the instructor used more definite deadlines for the two main deliverables to help students pace their project.

In terms of communication, the instructor tried to model preferable communication modes by shifting from email to Moodle tools (e.g., course news announcements, weekly updates, and discussion forums for optional topics) for sharing information with the whole class. In order to explicate his availability, the instructor shared his travel plans for the semester in the course syllabus in the hopes that the students could follow his example to be proactive in informing group members of possible absences or leaves. Efforts were also made to increase the online presence and to help class members to get to know each other. In the first week, the instructor asked all class members, including the researchers and course facilitators, to upload their pictures and then introduced an ice-breaking activity by leading the class to share some interesting information about themselves. The course also made use of Moodle's ability to attach a picture to each student's name in discussion forums so as to increase visibility and foster a sense of community. In the meantime, the course instructor encouraged groups to not only update their own group wiki in time but also visit other groups' wikis for information sharing and progress monitoring.

Changes to online discussions included: First, an addition of optional discussion forums where people can freely post any topics of interest while keeping the required "Question of the Week" discussions which were based on weekly readings. Second, the required discussions were a little more structured as there was a requirement for responses to at least three classmates.

The fourth aspect of improvement involved enriched course materials. The existing book chapters written by the instructor and narrated PowerPoint presentations remained the primary

materials while supplementary readings, case studies, online tutorials, and a few additional PowerPoint presentations were assigned. The course also provided more evaluation resources, including the instructor's webpage which presented a collection of evaluation tools and a number of items added to the course weekly content.

In the first iteration, the students were assessed on the basis of the group evaluation project, discussion participation, and peer assessment of contributions. A difference in this iteration was the addition of a component for assessing individual learning of evaluation, which consisted of three quizzes available at the course Moodle site. Moreover, the course provided specific rubrics for assessing the evaluation plan, evaluation report, and online discussion participation. In terms of data collection for course improvement as well as for the research, the Evaluation Planning Process Assessment was renamed as a Mid-term Evaluation and a final Course Evaluation was administered at the end of semester in addition to peer and self-assessment instrument.

Lastly, the design team strived to promote technology use for facilitating learning in three ways: First, the course facilitators created a Moodle Survival Guide as a how-to to help students use Moodle tools for organizing and managing their study. With the given technical information, the students were strongly encouraged to utilize the course website as a centralized place for their course related activities. For example, the course facilitators modeled use of Moodle course email and expected the students to maximize its use. It should be also noted that soon after the semester started, the designers turned on the subscription feature in the online discussion forums so that students could receive email notifications every time a new posting was made. Second, the whole team worked more closely to ensure wiki functionality. Third, the course encouraged students to use their choice of collaboration tool for group meetings (such as Skype) and

collaborative writing (such as Google Docs). Figure 3.2 shows a screen capture of the course design version 2.0.

Figure 3.2

*Design Principles and Strategies Refined after Two Course Iterations*

This section discusses the refined design principles and associated course design and implementation strategies based on the findings from the two course iterations. Table 3.2 presents a summary of these principles and strategies that work together to strengthen the motivational, cognitive, and metacognitive aspects of student learning during the course period.

*Design Principle 1: Engage students with relevant and meaningful learning tasks.* Self-regulated learning has a strong relationship with positive motivational beliefs (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Recent research also confirmed the correlations between motivation and self-regulatory strategy use in online environments (Artino, 2008). Perceived control and intrinsic motivation are critical for use of self-regulatory strategies (Eshel & Kohavi, 2003; Vollmeyer & Rheinberg, 2006). It has also been found that intrinsic motivation is negatively correlated with academic procrastination of online graduate students (Rakes & Dunn, 2010). One consideration in designing learning tasks should be their relevancy and meaning to students so that these learning tasks can arouse interest within students and engage them through provision of choices in making specific learning arrangements. Authentic tasks are more likely to engage students with their real-life relevance and opportunities for problem-solving, representing diverse perspectives and reflecting (Herrington, Reeves, & Oliver, 2010). In the case of teaching evaluation, authentic tasks are most appropriate because of the innate connections between the authentic projects and conceptual learning from course materials.

In this regard, the main design strategy utilized in this course was to use authentic evaluation projects as the overarching learning task. However, the task relevance still needed to be clarified at the very beginning because although the connections were apparent to some students, some others with little or no work experience might not see the relevancy as easily. Another aspect associated with the use of authentic tasks was to design other course activities grounded in this central task to enhance students' conceptual learning and to encourage them to directly apply knowledge and skills in actual evaluation situations. One specific strategy was to synchronize course materials and activities to match project progress as much as possible, although complete coincidence was almost impossible since each group proceeded at a different pace. It should also be made clear to the students that taking risks and making mistakes are part of studying a subject like evaluation, and the students should be encouraged to learn proactively through trial and error.

*Design Principle 2: Create a strong online presence.* Online interactions are an essential part of online courses. Further, teacher presence is critical because there is a strong relationship between students' cognitive presence and instructor presence (Garrison, Anderson, & Archer, 2000). The instructor him or herself should sustain a high level of participation himself if he expects satisfactory participation and engagement on the learners' part. Moreover, recent research on online SRL indicated positive relationships among social interactions, teaching presence, learning presence, and self-regulatory strategy use (Baron, 2007; Ke, 2010; Shea & Bidjerano, 2010; Swan, 2004). Thus, online presence and social interactions of all class participants should be strengthened.

To this end, the instructor in this course made himself visible on the course website by making course announcements in course news forums, periodic responses on discussion boards,

and weekly updates summarizing group project progress and online discussions. He also responded very quickly to individual student's questions and requests via email, normally within 24 hours. Course deliverables were turned around in a timely manner so that the groups could quickly continue their projects with constructive feedback. The instructor also shared his pictures and activities during his travels for conferences and other business at the course website. In addition, the ice-breaking activity that involved sharing of pictures and interesting personal information in the first week was very efficacious in helping people to know each other. Maximizing use of Moodle-provided tools within the course instead of sending private emails also contributed to greater transparency as well as visibility of instructor and students. There was also a need to create a discussion board for socialization purposes, which was called the "student lounge".

*Design Principle 3: Enhance course structure and guidance.* Evaluation is a challenging subject. To learn it well requires not only book knowledge but more importantly flexibility and savvy in appropriate application of knowledge, skills, tools, and techniques. The authentic learning tasks provided the students an opportunity to start developing these through solving open-ended problems. However, since this type of problem requires a higher level of critical thinking and self-regulatory strategy use, not all learners benefit equally from such tasks (Lodewyk, Winne, & Jamieson-Noel, 2009). Considering the students' novice status in this field, more structure and guidance were necessary to scaffold the students through the authentic task completion. Additionally, the course structure was increased in some ways to reduce logistic concerns.

The specific strategies in this effort included: (1) communicate instructor commitment, outcomes, and work quality in course syllabus at beginning of semester as well as through online

discussions, course announcements and weekly updates during the semester, (2) provide clear due dates for both individual assignments (mainly online discussion postings and quizzes) and group evaluation projects, (3) provide advice from previous students on how to succeed in the course at the course website, (4) provide general guidelines for authentic evaluation projects to the whole class, and (5) provide specific guidelines for specific group projects as needed.

*Design Principle 4: Enrich course materials and resources and communicate expectations about resource use.* Conducting real-life evaluations requires many resources. A single textbook is far from enough to help students build the knowledge base and skills sets they need to do evaluation projects with quality. Except for the basic theoretical knowledge, the students also needed practical information on a range of topics about evaluation planning, data collection and analysis, and evaluation reporting. They also needed information related to their specific evaluation projects. Therefore, one important aspect of the course design involved providing enriched course materials and resources. On the other hand, the students would not be able to learn substantially and to conduct a trustworthy evaluation if they overly relied on existing resources and used them indiscriminately. Expectations about appropriate use of resources ought to be communicated early in the semester.

The course applied the following specific strategies regarding course materials and resources: (1) provide a variety of engaging study materials and resources that are relevant to the course evaluation project, (2) make all course materials readily available and print-friendly for ease of organization and transformation as well as for convenience of current use and future reference, (3) encourage students to think critically and use the resources adaptively, (4) provide work examples early on to allow students enough time to think about how to adapt examples for

their own use, and (5) encourage open resource sharing among students (for example, on class and group discussion boards).

*Design Principle 5: Improve communication and interactions at all levels.*

Communication is critical for distance courses due to student displacement and the amount of information to be exchanged. There could be more emphasis on effective communication as it was vital for successful completion of the collaborative, authentic evaluation projects.

Communication in this course occurred at several levels — between the instructor and the students, among the students as a whole class, among the students in a group, between the students and their clients, and between the instructor and the clients. Communication also partially affected online interactions, which in turn affected students' learning experience and self-regulation (Hill, Wiley, Nelson, & Han, 2004; Swan 2004). It was challenging to ensure effective communication at all these levels, but success of the course largely depended on it.

Many efforts were made in this aspect. First, at the time of course redesign, the instructor decided to limit enrollment to students located in North America to eliminate complications caused by excessive time zone differences. Second, the course design team provided immediate assistance when the students encountered technical issues. Third, the students were encouraged to use the Moodle course website as a centralized place for their course related activities to improve transparency and efficiency. The course offered an email feature, an online discussion subscription feature, group wikis, group discussion boards, and chat rooms. In particular, the students were encouraged to share their evaluation plans and reports on group wikis. This, on one hand, supported collaborative editing with available tools and on the other hand, cultivated a culture of sharing and co-monitoring. Similarly, the instructor modeled the expected communication mode by trying to use the Moodle tools as much as possible when he

communicated with the whole class. For evaluation project related communication, the instructor copied group members on most of his email correspondence with that group's client, demonstrating professional demeanor and quality in terms of communication. Additionally, he helped the groups sustain their communication with the clients when interventions were needed. Lastly, the students were encouraged to ask questions, share concerns, and seek help at all times (with the course instructor and facilitators/designers) via emails, drop-in visits, phone calls, Instant Messaging chat, etc. Furthermore, the instructor learned to go beyond verbal encouragement and reach out to students because it was just difficult for some students to initiate interactions with the instructor as an authority figure.

*Design Principle 6: Guide and moderate online discussions.* The findings indicated a need for the instructor to guide and moderate online discussions for several reasons. First, the instructor's presence on online discussion board was perceived as an indicator of student participation and insights being valued. Second, sometimes discussions went off topic. While some students enjoyed the extra information, some thought this was irrelevant and refrained from responding. In this situation, the discussion needed to be redirected and refocused. Third, occasionally there were "confrontational" moments when some students expressed disagreement inappropriately. At these times, instructor moderation helped to minimize the negative impact and restore student participation.

In terms of specific strategies for maintaining effective discussions, the instructor facilitated practical discussion topics that connect to the course evaluation projects. To allow time for continued and deeper discussion, the course should also set a deadline for initial postings. To assess discussion participation and quality, the instructor provided a rubric so that the students could learn how to be a better discussant. The discussion board should also cultivate

an open but safe culture where students feel free to disagree yet in a respectful manner. The instructor needed to moderate online discussion intermittently to see how students were doing and if there was anything needing intervention.

*Design Principle 7: Assist students in planning and time management.* Planning and time management, important aspects of self-regulated learning, involve considering specific steps towards learning goals and allocation of time resource (cf., Zimmerman & Schunk, 2001). Planning and time management strategies have also proven beneficial in online courses (Hu & Gramling, 2009; Hsu, Ching, Mathews, & Carr-Chellman, 2009). To learn academically in a semester university course demands planning regarding fulfilling course duties and time allocation during regular weeks. To do a practical project with quality requires careful planning as well. With the demands from both content learning and authentic evaluation projects in this course, students' planning at a personal and group level could not be more important.

To assist the students in better planning for their study in the course, the instructor facilitated this process by emphasizing deadlines. To scaffold students' planning for evaluation projects, the instructor shared planning tips for conducting real-life evaluations in narrated PowerPoint presentations. To avoid procrastination or workload buildup due to poor planning for the evaluation projects, he also guided the students to set interim deadlines within the groups according to specific group project situations. In addition, advice on how to pace important work for evaluation implementation and reporting were offered to the whole class and individual groups. Additionally, since the instructor travelled a lot during the semester, he listed all the travel dates and destinations on the course syllabus at the beginning of semester. The students were also informed of an estimation of the extra time in email correspondence during travel. By

doing so, he communicated his expectation for the students to handle absences and leaves in the same manner because of the interdependence within students groups.

*Design Principle 8: Assist students in monitoring.* Monitoring is another key aspect of self-regulated learning (cf., Zimmerman & Schunk, 2001). Students used monitoring strategies to succeed in online courses (Hsu et al., 2009). However, when the students failed to monitor their processes themselves, adoption of monitoring tools was really helpful to facilitate student learning in online environments (Park, 2003). The goal of the course was to help students successfully gain knowledge and skills related to evaluating instructional products. Thus, the instructor intended to assist them in every way he could no matter whether they needed assistance for active monitoring of learning process on their own part or if he needed to keep track of their progresses through external monitoring.

Therefore, the following specific strategies were applied to facilitate students' monitoring process: (1) encourage students to review course objectives and check their skills against the evaluation skills inventory towards the end of semester, (2) present weekly tasks in an outline format in Moodle, which served as a checklist for students to monitor weekly progress, (3) send email reminders containing weekly tasks in the middle of each week, (4) check-in frequently with groups about their projects so that questions, concerns, and issues could be addressed in time, (5) post weekly updates on group project status with a summary of online discussions in Moodle, (6) provide individualized and constructive feedback in a timely manner so that students could use it to regulate their learning accordingly, (7) turn on the online discussion subscription feature to help students follow new postings with ease, and (8) encourage student use of technology-enhanced monitoring tools, such as programs for project and task management as well as web-based calendars.

*Design Principle 9: Provide guidance for group work and facilitate group collaboration.*

Effective group work is usually difficult to achieve. The authentic projects added to this difficulty as the communication with clients and evaluation implementation on site required much more coordination and management. Moreover, not all the students understood how to build positive group dynamics. Considering these factors, the course provided specific guidance to assist group members in selecting a group leader, reconciling expectations about collaboration and the evaluation project, and organizing regular group meetings. In terms of technology, the students were encouraged to take advantage of various collaborative tools inside and outside of Moodle, especially collaborative editing tools with record tracking functionality. Whenever group or project issues occurred, the instructor assisted in their resolutions at an early stage. Since group members were dependent upon each other in their collective effort to complete the evaluation projects, it was also recommended that they monitor each other's progress and seek help and resources within the groups through co-regulation.

*Design Principle 10: Provide ample opportunities for individual students to assess learning processes and gains.* Traditional assessment of learning focuses on measurement of learning outcomes using tests, exams, and assignments (Reeves, 2000). It is cautioned, however, that solely relying on summative evaluation methods leads to neglect of many of the important aspects of online teaching and learning (Palloff & Pratt, 1999). Only assessing course deliverables, such as written exams and papers, undoubtedly gives an incomplete appraisal of learner's learning efforts and gains. On the other hand, self-evaluation is an integral part of the learning process of self-regulated learners. Formative assessment and feedback can help students take control of their learning (Nicol & MacFarlane-Dick, 2006). Thus, formative assessment of student performance was incorporated in this online course.

The inclusion of formative assessment was also meaningful in that it was conducive to maintaining a strong online presence of course participants. Because of the unique features of online education, the virtual classroom lacks presence and the kinds of interactions found in a physical classroom. Use of non-threatening assessment methods in the course, such as evaluating online discussions in terms of quantity and quality, providing feedback for student work in progress, and assessing students' contributions to group projects based on peer evaluation, helped students to participate in both individual and group learning activities continuously.

Authentic tasks as a pedagogical strategy emphasizes the meaningfulness of the assessment activities in their own right and their natural connections with what has been taught (Herrington, Reeves, & Oliver, 2010). The main assessment approach associated with the authentic tasks in this course was judging the final products' (the evaluation plan and final evaluation report) quality and usefulness. Actually, the students received direct feedback on how their evaluation plan worked when they implemented it on the evaluation site. Similarly, they had an estimate on their own in terms of how useful their evaluation recommendations made in the final report could be for their clients. In addition, the final feedback from the instructor provided a comparison of their self-evaluation and the teacher's evaluation of the eventual deliverables. In this sense, the assessment of the authentic tasks was conducive to student reflection and self-evaluation that are integral to self-regulated learning. Inclusion of grading rubrics was proven especially helpful for the students to assess their own performance before submitting their work to the instructor.

Last, the main evaluation projects that carried most of weight in terms of grading reflected the collaborative efforts of student groups. There was also a need for assessing individual student's learning. To this end, the course used three quizzes composed of scenario-

based long answer questions at different points of the semester to assist the students in connecting the concepts they acquired from course content. Instead of testing the students' memorization of facts and definitions, the quizzes prompted the students to synthesize their knowledge and use critical thinking. The instructor's individualized feedback on these quiz questions helped the students to identify their cognitive gaps. The student feedback suggested that these quizzes would be most helpful when administered at appropriate intervals and with consistent challenge levels.

### **Conclusion**

The challenging subject of evaluation can be taught online with success through an understanding of how the challenges can be overcome by optimizing adult learners' self-regulation. The case presented in this article shows how the design of an E-learning Evaluation course was improved to support various aspects of students' self-regulated learning experiences based on data collected from course participants. The designers hope that more efforts like this will be made in exploring innovative approaches to teach evaluation effectively in web-based environment so that more learners can benefit from increased opportunities.

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Table 3.1  
*Researchers and Their Suggested Design and Implementation Strategies*

Author(s)	Categories of Principles	Design and Implementation Principles
Lin, Hmelo, Kinzer & Secules (1999)	Supporting metacognition in technology supported learning environments	<ul style="list-style-type: none"> <li>• Provide multiple models of real performance</li> <li>• Prompt learners to investigate their own thinking while problem-solving</li> <li>• Provide visual displays of the processes students have utilized as they solve problems</li> <li>• Provide students with multiple perspectives on process through reflective social dialogue</li> <li>• Scaffold adoption of expert strategies by providing examples and a context for application</li> <li>• Develop a strong sense of self as learner and problem solver by enabling goal-setting</li> <li>• Create a social setting online with support for interaction and communication</li> </ul>
Mcloughlin (2002)	Scaffolding across different teaching contexts	<ul style="list-style-type: none"> <li>• Orientation: communication of expectation</li> <li>• Coaching</li> <li>• Eliciting articulation</li> <li>• Task support</li> <li>• Expert regulation</li> <li>• Conceptual scaffolding</li> <li>• Metacognitive scaffolding</li> <li>• Procedural scaffolding</li> <li>• Strategic scaffolding</li> </ul>
Ley & Young (2001)	Embedding self-regulation support in instruction	<ul style="list-style-type: none"> <li>• Guide learners to prepare and structure an effective learning environment</li> <li>• Organize instruction and activities to facilitate cognitive and metacognitive processes</li> <li>• Use instructional goals and feedback to present student monitoring opportunities</li> <li>• Provide learners with continuous evaluation information and occasions to self-evaluate</li> </ul>
Antino (2008)	Online design implications	<ul style="list-style-type: none"> <li>• Assess components of students' SRL and supply individualized feedback</li> <li>• Provide students with differential support</li> <li>• Develop and support students' self-efficacy</li> <li>• Clarify task relevance and design online activities that are grounded in authentic problems to generate interest</li> <li>• Scaffold online discussions</li> <li>• Utilize peer models and encourage collaboration and co-regulation</li> </ul>

Figure 3.1  
*The E-Learning Evaluation Course Design Version 1.0 (Spring 2008)*

The screenshot displays the 'E-Learning Evaluation' course interface. At the top, it shows the course title and the user's login status: 'You are logged in as Ying Liu: Student (Return to my normal role)'. Below this is a navigation bar with 'school' and 'Evaluation' tabs, and a 'Return to my normal role' button.

The main content area is titled 'Weekly outline' and shows the dates '11 February - 17 February'. A yellow 'WELCOME' box contains the text: 'to Week 1, everyone! Please complete the following activities:'. Below this, a numbered list of six activities is provided:

1. Review the course [syllabus](#)
2. Introduce yourself and participate in Ice-breaking activity in [Ice-Breaking Activity Forum](#)
3. Read [Chapter 1](#) from [Course Textbook](#)
4. Read Introduction and Section I from [2002 User-Friendly Handbook for Project Evaluation](#)
5. View this narrated PowerPoint presentation about "Paradigms"
6. Post your questions and reflections on readings in [Week 1 Readings Forum](#)

The interface also features several sidebars:

- People:** Participants
- Activities:** Chats, Forums, Resources, Wikis
- Search Forums:** Includes a search box and an 'Advanced search' link.
- Administration:** Grades, Unenrol me from Evaluation
- My courses:** EDIT 9990 Design Research in Education
- Latest News:** (Empty)
- Upcoming Events:** There are no upcoming events. Includes a 'Go to calendar...' link.
- Messages:** No messages waiting. Includes a 'Messages...' link.

Figure 3.2  
*The E-Learning Evaluation Course Design Version 2.0 (Fall 2008) (Printable Version)*

**EDIT 8350 E-Learning Evaluation Fall 08** You are logged in as [Ying Liu](#) (Logout)

school ▶ EvalFall08 Switch role to... Turn editing on

**People**

Participants

---

**Activities**

Chats  
Forums  
Quizzes  
Resources  
Wikis

---

**Search Forums**

Go

[Advanced search](#)

---

**Administration**

Turn editing on  
Settings  
Assign roles  
Grades  
Groups  
Backup  
Restore  
Import  
Reset  
Reports  
Questions  
Files  
Profile

**Weekly outline**

- Course news forum
- Moodle Survival Guide
- Chat-space
- [Evaluation Groupwork Forum] Group 1
- [Evaluation Groupwork Forum] Group 2
- [Evaluation Groupwork Forum] Group 3
- [Evaluation Groupwork Forum] Group 4
- [Evaluation Groupwork Forum] Group 5
- Group 1 Wiki
- Group 2 Wiki
- Group 3 Wiki
- Group 4 Wiki
- Group 5 Wiki

---

18 August - 24 August

**WELCOME**

to Week 1, everyone!

Please complete the following activities:

1. Review the [Course Syllabus](#)
2. View this narrated PowerPoint presentation [Welcome to the Course](#)
3. Introduce yourself and participate in ice-breaking activity in [Ice-Breaking Activity Forum](#)
4. Read [Chapter 1](#) from [Course Textbook](#)

**Latest News**

[Add a new topic...](#)

14 Dec, 12:57  
Thomas Reeves  
[Final Weekly Update more...](#)

1 Dec, 21:01  
Thomas Reeves  
[Week 16 Update more...](#)

24 Nov, 18:30  
Thomas Reeves  
[Week 15 Update more...](#)

17 Nov, 10:09  
Thomas Reeves  
[Week 14 Update more...](#)

11 Nov, 12:28  
Thomas Reeves  
[Week 13 Update more...](#)

[Older topics ...](#)

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**My Course Mail**

[Check Mail](#)

---

**Calendar**

June 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18

Table 3.2  
*Design Principles and Strategies in the Course*

Principles	Design and implementation strategies
1. Engage students with relevant and meaningful learning tasks	<ul style="list-style-type: none"> <li>• Use authentic evaluation tasks</li> <li>• Clarify task relevance</li> <li>• Design online activities that are grounded in authentic problems to generate interest</li> <li>• Sequence materials and activities to match project progress</li> <li>• Encourage risk taking, trial-and-error</li> </ul>
2. Create a strong online presence	<ul style="list-style-type: none"> <li>• Help students to go to know each other through ice-breaking activities</li> <li>• Ask each class member to upload a picture</li> <li>• Create an discussion board for socialization purpose (“student lounge”)</li> <li>• Use tools in CMS instead of email for whole class interactions</li> <li>• Sustain a high participation level of both instructor and students</li> </ul>
3. Enhance course structure and guidance	<ul style="list-style-type: none"> <li>• Communicate instructor expectations about commitment, outcomes, and work quality at beginning of semester</li> <li>• Provide clear due dates</li> <li>• Provide advice from previous students on how to succeed in the course</li> <li>• Provide general guidelines for authentic evaluation projects to the whole class</li> <li>• Provide specific guidance for specific group projects as needed</li> </ul>
4. Enrich course materials and resources and communicate expectations about resource use	<ul style="list-style-type: none"> <li>• Provide a variety of engaging study materials and resources relevant to course project</li> <li>• Make all course materials readily available and print-friendly</li> <li>• Encourage critical thinking and adaptive resource use</li> <li>• Offer work examples early on</li> <li>• Encourage open resources sharing among students</li> </ul>
5. Improve communication and interactions at all levels	<ul style="list-style-type: none"> <li>• Take time zone differences into consideration when designing course activities.</li> <li>• Assisting students in troubleshooting at times of technology break-down</li> <li>• Encourage use of tools provided at the course site as much as possible</li> <li>• Model expected communication mode by maximizing use the Moodle tools for communicating with the whole class</li> <li>• Model professional communication manners by copying group members on most of the instructor’s email correspondence with that group’s client</li> <li>• Help students sustain communication with clients</li> <li>• Encourage help-seeking at all times (with the course instructor and facilitators/designers) via emails, drop-in visits, phone calls, Instant Messaging chat, etc.</li> <li>• Reach out to individual students</li> </ul>

Table 3.2  
*Design Principles and Strategies in the Course (continued.)*

6. Guide and moderate online discussions	<ul style="list-style-type: none"> <li>• Use practical discussion topics that connect to the course evaluation projects</li> <li>• Set a deadline for initial postings</li> <li>• Provide a rubric for grading discussions</li> <li>• Build an open but safe a culture so that students feel free to disagree yet in a respectful manner</li> <li>• Moderate online discussions intermittently and when interventions are needed</li> </ul>
7. Assist students in planning and time management	<ul style="list-style-type: none"> <li>• Scaffold planning for evaluation project</li> <li>• Emphasize deadlines</li> <li>• Introduce project interim deadlines</li> <li>• Advise how to pace important work</li> <li>• Model planning by sharing travel arrangement at the beginning of semester</li> </ul>
8. Assist students in monitoring	<ul style="list-style-type: none"> <li>• Encourage students to review course objectives and check their skills against the Evaluation Skills Inventory towards the end of semester</li> <li>• Present weekly tasks in an outline format in Moodle</li> <li>• Send email reminders containing weekly tasks in the middle of each week</li> <li>• Use frequent check-ins for group projects</li> <li>• Post weekly updates in Moodle</li> <li>• Provided individualized and constructive feedback in a timely manner</li> <li>• Turn on online discussion subscription feature to help students follow new postings</li> <li>• Encourage use of technology-enhanced monitoring tools</li> </ul>
9. Provide guidance for group work and facilitate group collaboration	<ul style="list-style-type: none"> <li>• Guide students to select a group leader</li> <li>• Guide group members to reconcile expectations about collaboration and the group project</li> <li>• Encourage co-regulation of self and peer</li> <li>• Encourage regular group meetings and minutes keeping</li> <li>• Encourage use of collaborative tools, especially collaborative editing tools with record tracking functionality</li> <li>• Assist in resolving group and project issues at an early stage</li> </ul>
10. Provide ample opportunities for individual students to assess learning processes and gains	<ul style="list-style-type: none"> <li>• Encourage use of evaluation rubrics for course projects and other assignments</li> <li>• Use non-threatening assessment such as low-stake quizzes</li> <li>• Make sure the assessments are provided at appropriate intervals and with a consistent challenge level</li> <li>• Use mid-term evaluation, peer and self-evaluation, and final course evaluation to improve individual and group performance as well as course design</li> </ul>

## CHAPTER 4

### METHODOLOGY, FINDINGS, AND DISCUSSION

#### Overview

The purpose of this educational design research (McKenney & Reeves, 2012) study was to design an optimal online learning environment that supports effective self-regulated learning (SRL) and to identify reusable design principles for the development of future online learning environments that maximize SRL. Specifically, this study investigated graduate students' self-regulatory processes and looked into how course design and contextual support influence students' motivational, behavioral and metacognitive aspects of self-regulation based on Zimmerman's (1989, 2001) social cognitive SRL model. The study was guided by the following research questions:

1. How is the motivational aspect of the students' self-regulated learning evident in this course?
2. How does the environment affect students' self-regulated learning and what challenges do students encounter?
3. How do students use self-regulated processes and strategies in the course?
4. What support can be built in this learning environment to promote students' self-regulated learning?

This chapter is devoted to discussing the research design, research context and procedures, data collection and analysis methods for the study as well as the findings. It also addresses issues of validity and reliability, limitations, and implications of the study.

## **Design of the Study**

### *Identifying the Research Goal*

Overall, I have sought to support students' SRL processes in an online course environment. To this end, it was imperative to understand how individual students' self-regulate their learning process and to identify the most influential factors for student self-regulation in this learning environment. Thus, according to Reeves's (2000) classification of research goals, my study primarily has a development goal, which is based on the attainment of a secondary interpretative goal. Educational design research, which aims to create viable solutions in practice through contextualized investigation as well as to identify and refine reusable design principles, was deemed as the approach most appropriate to achieve my research goals.

### *Defining Design Research*

Design research (Cobb, 2001; Collins, Joseph, & Bielaczyc, 2004; Edelson, 2002), also labeled as design-based research (Design-Based Research Collective [DBRC], 2003), design experiments (Brown, 1992; Collins, 1992), development research (Van den Akker, 1999), formative research (Reigeluth, 1989), and educational design research (McKenney & Reeves, 2012) is a research genre developed by and for educational researchers that encompasses "a series of approaches, with the intent for producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings" (Barab & Squire, 2004, p. 2). Wang and Hannafin (2005) define this term more specifically as "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (p. 6). These definitions reveal the dual purposes of educational design research as

(1) to develop innovative and viable interventions to solve practical problems in a realistic context, and (2) to develop theoretical and applicable design principles that are grounded in systematic inquiry into the complex processes of teaching and learning.

As a unique approach to educational inquiry, educational design research is characterized as: pragmatic and theory-oriented, participatory, interventionist, grounded, integrative, interactive, iterative, and flexible (Wang & Hannafin, 2005; Van den Akker, Gravemeijer, McKenney, & Nieveen, 2006). These characteristics distinguish design research from other educational research genres, methods, and processes. Specifically, design research is different from traditional experimental research in that it begins with a real-world problem, involves practitioners as important stakeholders in the design and research process, develops and tests interventions in naturalistic learning settings, and eventually generates both theoretical principles and practical products. Educational design research is different from action research because (1) both researchers and practitioners (as opposed to practitioners alone) are the major players in the process, and (2) it is theory-driven and aims to advance new postulations (Wang & Hannafin, 2005). Additionally, design research is different from formative evaluation in that (1) the former is a research paradigm while the latter is one of the methods employed in the overall research process (Van den Akker, 1999), and (2) the former entails a theory-generation goal that is absent from the latter (Barab & Squire, 2004; Wang & Hannafin, 2005). Lastly, the detailed documentation of the design process in educational design research and, again, its theory-oriented features, further distinguish it from design alone (Edleson, 2002).

#### *Rationale for Research Approach Selection*

Existing research on SRL, especially the studies found in the educational psychology literature, is mostly analytical in nature (Corno, 1995) and predominantly employs experimental

or quasi-experimental designs that heavily rely on examination of intervention effects under controlled conditions. While this type of research has led to identification of many correlational and even a few causal relationships related to SRL, the utility of the findings is limited in two ways. First, such research falls short of both detailing the processes that learners use to regulate their learning and revealing the nature of the complex interactions between learners and learning environments. Second, conducting SRL research in controlled settings leads to laboratory-tested results that may be seriously flawed when extended to practical contexts, and the responsibility of viability testing has been shifted from the researchers to the practitioners. For these reasons, this research approach may not achieve the expected impact in confronting the realities of teaching and learning.

With the publication of several exemplary studies employing qualitative methodologies in this area (Reed, Schallert, & Deithloff, 2002; Meyer & Turner, 2002; Patrick & Middleton, 2002), Butler (2002) strongly advocated that qualitative, descriptive, and interpretive approaches should be more widely adopted to investigate SRL in order to understand “SRL in context and documentation of intervention-outcome linkages” (p.59). Corno (1995) also used Xu’s (1994) study as an example of “systemic research” that uses alternative, pragmatic approaches to investigate SRL in practice. While these approaches have greater practical relevance and thus more potential to serve my research goals (identified in previous section) than traditional experimental approaches, they are nonetheless limited in guiding me and others in the development of interventions to promote SRL in online learning contexts.

With these considerations, educational design research was judged to represent the most viable approach for tracing linkages between design, intervention, and learning in online learning environments. It has enabled me to develop the study into a socially responsible research

initiative (Reeves, Herrington, & Oliver, 2005); by use of flexible methods and interactive process, my research has enjoyed a greater chance to culminate in the creation of both practical and theoretical outcomes for enhancing learners' SRL.

## **Research Context**

### *Context of the Study*

The context for my study has been the design and development of a new online version of an Instructional Product Evaluation, a course that has been taught for 15 years by the same instructor in a face-to-face format. A needs assessment revealed that there is a paucity of online evaluation courses with a focus on evaluating instructional technologies. This motivated the instructor to put together an educational design research team to develop a course that not only retains the essence of the face-to-face evaluation course but also is viable online so that a larger number of interested audiences can access the course and benefit at a distance. As part of this research team, I investigated SRL, and another doctoral student member of the team investigated group work in the same course (Oh, 2011).

Created based on a constructivist view of learning (Jonassen, 1991), the course adopts a primary pedagogy that uses authentic learning tasks (Herrington, Reeves, & Oliver, 2010) to enhance conceptual learning of evaluation and practical applications of related skills. It also features the use of collaborative groups to mimic the way that this type of evaluation usually takes place in real life and to foster learning through social interactions. Typically, students work in groups of 2-4 people with real clients to plan, implement, and report an evaluation of a given e-learning product (e.g., a web-based course or an interactive multimedia training module). As students must study the course materials on their own while working with their teams on a real

project, SRL is crucial for them in order to achieve the course objectives. Thus, this course provided an appropriate environment for my study.

The online course was delivered asynchronously through Moodle, an open-source course management system available at no cost for every learner with Internet access. The system allowed structuring the course in the form of a weekly outline as illustrated by the screen capture in Figure 4.1.

Figure 4.1

The instructor used various learning activities to facilitate learning: readings, case studies, narrated presentations, online discussions, quizzes, and group projects. A number of functions of Moodle were also used to facilitate both individual learning and group work. For example, students could discuss group projects in their group discussion forums or chat rooms and edit their evaluation documents through group wikis; the instructor sent out weekly or general announcements through a general course news forum, which went to students' email automatically; the current week of the schedule was usually marked by two colored vertical bars; and a calendar at the right side of the course site reminded students of the date and allowed them to add their own events. The course was operated based on a U.S. university semester schedule and had a 16-week plan. It was offered over three semesters between 2008 and 2009.

### *Research Participants*

To accomplish the purpose of developing this online version of the E-Learning evaluation course, the instructor recruited students not only from his own university but also from other institutions in and outside the U.S. Prior to the beginning of the semester, the instructor sent out the course description shown in Appendix A to faculty members at a number of institutions, who in turn spread the information to their students and helped those interested enroll in this course.

At the beginning of the semester, the researchers recruited research participants by sending out research participation invitations (see Appendix A) via email, making it clear to students that participation was completely voluntary and no incentives or penalties were involved. The invitation also communicated the purpose of this study and expectations for participants.

Typically, students enrolled in the course were graduate students of Instructional Technology or similar majors. They generally entered the course with fairly proficient computer skills, but some were new to this type of online learning environment. Though student composition varied from semester to semester, the students usually represented a wide range of ages, jobs, and cultural backgrounds. For the first iteration of the course in the spring of 2008, the research participants were five of the eight graduate students enrolled in the course. These students came from different universities in Australia, South Africa, and the USA. They were part-time or full-time graduate students with very diverse ethnic, cultural, and professional backgrounds and ranged in age from their 30s to their 50s. For the second iteration of the course in the fall of 2008, the research participants were eleven of the sixteen graduate students in the course who were from four different universities in Canada and the USA. Except one graduate student working full time as an instructional designer, the other students were all full time graduate students in Instructional Technology. A third iteration of the course was offered, but it was not included in my study because there were little differences in SRL detected between the second and third iterations.

### **Design Research Procedures**

As the concept of educational design research is relatively new, its research methods and techniques are still developing. Consequently, the research procedures are left to design researchers' discretion and should be guided by the research questions and context of specific

studies. In general, the design research approach requires close collaboration between practitioners and researchers in the iterative processes of identifying practical problems in real educational settings, creating tested solutions based on existing design principles, and generating new design principles applicable to other situations (McKenney & Reeves, 2012; Reeves, 2006). Therefore, design and research interplay with each other. To begin my study, I worked with the course instructor and another graduate student researcher to design a prototype online course environment and integrate elements for promoting effective SRL. The design and research process was conducted on the basis of Reeves' model for development research which entails four stages, i.e., analysis of practical problems, development of solutions, evaluation and testing of solutions, and generation of design principles (Reeves, 2000a). This study consisted of five phases that include three cycles of course implementation and data collection. Figure 4.2 illustrates how these phases correspond to the development research stages in Reeves' model. Although the general processes and methods for each implementation cycle stayed consistent, there were small variations in specific strategies and techniques based on the research needs. The following section describes the design research procedures in more specific terms.

#### *Preliminary Phase* (Phase 0 as shown in Figure 4.2)

The preliminary phase corresponded to the first stage in Reeves' development research model. In this phase, the main activities took place from summer 2007 to fall 2007 and focused on identification of the need for the design project and the appropriate approach for the research study. In summer 2007, I worked with another researcher on a needs analysis about existing online evaluation courses (i.e. their availability, delivery, purpose, pedagogical elements, and study materials). The results confirmed a need for an internationally accessible "E-Learning Evaluation" course. This need was also verified by the number of requests the instructor received

over the years to offer the course to a broader audience. The other primary activities included (1) a literature review that justified the importance of self-regulation for effective online learning and identified a theoretical framework that served as a lens to examine SRL in the chosen learning environment; (2) discussions with the research team about the online course structure and issues, and initial preparation work to create an online learning environment; and (3) in-depth interviews with students from the face-to-face E-Learning Evaluation class to examine the appropriateness of the chosen theoretical framework for developing interview instruments.

### *Phase 1*

Phase 1 addressed the second through fourth stages in Reeves' model and involved a series of activities from spring 2008 to summer 2008. In the process of developing the prototype version of the online evaluation course, the team first made a final decision on the course management system (Moodle) to host the course and the design specifications based on the functions and structure of the online platform. The research team then incorporated into the course the design principles and strategies identified through literature reviews and through interviews with students in the face-to-face version of the course conducted in fall 2007. Design principles to specify how to support self-regulated learning and enact the design of the course were also synthesized during this process. The five principles guiding the initial design were: 1) Engage students with authentic learning tasks, 2) Enhance individual motivation and engagement, 3) Maximize the benefits of collaboration, 4) Facilitate students' self-regulatory processes and strategy use, and 5) Provide a variety of technology that everyone can use. At the same time, the research team members continuously modified the prototype as the semester progressed based on feedback from current students. The course prototype included a range of learning activities and assessment methods. The researchers served as the course facilitators to

help maintain smooth delivery of course contents, effective communication between students and the project team, and a positive learning atmosphere. The researchers and the course instructor also met frequently to discuss problems and issues as they arose and resolved them as promptly as they could.

Concurrently, the research team collected a variety of data to evaluate and test the prototype course and to inform their research studies. As part of the overall project, I investigated students' self-regulated learning in this online environment by conducting multiple interviews at several points of time in the semester. Early in the semester, data collection was focused on students' profiles, entry evaluation skills, motivational beliefs, previous online learning experience and typical learning processes in the course. As the group evaluation projects moved forward, changes in students' motivation and learning processes and some important self-regulatory strategies/processes, such as monitoring, self-evaluation, and help-seeking, became the focus of examination. At the end of the semester, the research team gathered data about students' final projects, peer and self-evaluations, and course evaluations. Additionally, my own interviews aimed at helping students reflect on their overall learning experience and outcomes in this course, on their self-regulatory learning processes, and on the factors mediating their learning. The instructor also shared his opinions about students' performances, their learning results and the course outcomes.

Subsequent educational design research activities involved preliminary data analysis and reflection of the researchers, leading to refinement of the course design and design principles for the following iteration. Meanwhile, I also revised the data collection instruments and refined the SRL theory in-situ based on the findings of the ongoing analysis. It should be noted that the activities described in this section did not happen in a linear fashion. Instead, they were

interwoven, influencing and informing each other at different points of time in the overall process.

### *Phases 2 and 3*

Phases 2 and 3 took place in fall 2008 and spring 2009 respectively, and each consisted of the same processes and activities as in phase 1. In Figure 4.2, phase 3.3 where I analyzed data from iteration 3 converged with the fourth phase of the overall research process and was also labeled as phase 4 as I considered everything together at the end of all three cycles.

### *Phase 4*

Phase 4, the summative evaluation stage of the overall project, started from the end of spring 2009 when I engaged in the final reflection on the three iterations of the course: development (refinement), implementation, and evaluation. I focused on the evolution process of the course, the final refinement of design principles, and the courses' impact on students' SRL over the three semesters.

### *The Researcher's Role*

Design researchers often play dual roles as both designers and researchers (Bannan-Ritland, 2003). In this research project, I took on a third role as a course facilitator as I collaborated intensively with the course instructor and a peer researcher in designing the online course and in collecting data to improve the learning environment. In my capacity as a designer, I worked with the project team to decide the design specifications, adopt specific instructional and assessment strategies, and develop and deliver course materials. In my capacity as a course facilitator, I also actively interacted with students via email or voice chat, monitored their learning activities, and resolved emerging problems to support their learning. In my capacity as a researcher, my major responsibilities were to develop a research plan, collect data from the

course and the students, analyze those data, derive the results and disseminate them in order to benefit more researchers and practitioners.

## **Data Collection**

### *Data Collection Methods*

Design-based research is not limited to specific research methods, such as only quantitative or only qualitative methods. Further, educational design research allows for and justifies the use of flexible methods at different stages (Hoadley, 2004). Primarily, my focus was to understand students' learning experiences and self-regulatory processes. Qualitative data collection methods most appropriately allowed me to gather information about student perceptions of the learning processes and students' roles in the learning experience. Meanwhile, a complementary quantitative method, surveys, was used to collect information regarding students' profile, their evaluation skills, and the effectiveness of the course. Archival documents and online observations assisted me in understanding SRL processes as secondary data sources. The following section explains the data collection methods used in this design research study.

*Interviews.* Interviews allow researchers to look into the other persons' lived experiences from their own perspectives and gather meaningful information from their accounts (Patton, 2002). To understand SRL, learners' awareness of their own thoughts and behaviors while learning content and skills was a challenging, complex, and crucial task. It was thus natural for me to go to learners for firsthand data about their self-regulatory processes. Therefore, in-depth interviews with learners were the primary data source to inform this study. Secondly, the course instructor was another important data source as he was able to provide information about the course design considerations and student performance. Interviews with the instructor helped to collect information in this regard.

Patton (2002) proposed three alternatives for conducting interviews, namely, the informal conversational interview, the general interview guide approach, and the standardized open-ended interview. I adopted different approaches for student and instructor interviews to accommodate my research needs. The student interviews were semi-structured (Esterberg, 2002) with a general interview guide so that “the same basic lines of inquiry are pursued” (Patton, 2002, p.343). At the same time, I had a certain level of liberty to ask follow-up or other related questions to expand the exploration. Information from the instructor was collected through informal conversational interviews and through semi-structured interviews at the end of each semester.

Regarding the student interviews, I interviewed each student three times on a one-on-one basis—in the early part of, in the middle of, and at the end of the semester respectively. The interviews were conducted via online voice chat or phone and lasted 30-60 minutes, depending on how much the interviewees desired to share regarding their motivational states, how they self-regulate their learning of the course content, and what their perceptions were about the course at the time. Appendix C shows examples of the interview protocols. All the interviews were digitally recorded and transcribed. Results from student interview data were used to understand their SRL and to further refine the course design.

The instructor interviews, when conducted informally, happened flexibly when I spoke with the course instructor individually or together with the research team about course design and implementation. The informal instructor interviews were not recorded. The formal instructor interviews, on the other hand, were arranged at the end of each semester after students had submitted final evaluation reports, conducted using an interview guide, and recorded digitally and transcribed. Table 4.1 demonstrates the specific schedule and focus for all interviews.

Table 4.1

*Surveys.* For this study, I used several surveys to collect course- and student-related information. The surveys were administered at the beginning of each semester include a student profile survey and an evaluation inventory. An Evaluation Planning Process Assessment (renamed as Mid-term Evaluation in second iteration) survey was conducted in the middle of the semester. At the end of semester, course evaluations, peer evaluations and self-evaluations were conducted in the form of questionnaires. The schedule and focus of each survey can be found in Table 4.2. The survey instruments as presented in Appendix D contain multiple choice questions, rating questions, and open-ended questions that require only brief answers.

Table 4.2

*Archival Data.* Merriam (2002) pointed out that artifacts are important as they open up opportunities to go beyond what can be learned from direct observation and interviewing. Archived documents and other data can be particularly useful for studying online learning in the absence of face-to-face interactions. In this study, archival data including the instructor's course materials and messages, students' online activity log, their submitted documents, postings in online discussion, and their emails were examined to illuminate the interactions in online courses as well as students' learning processes and outcomes. The instructor's written feedback was considered to be an integral part of these data and an important indicator of the quality of student performance and submitted work. However, because self-regulation mostly involves covert rather than overt processes (Zimmerman, 2000, 2001), archival documents contributed to the research in somewhat limited ways. Table 4.3 shows specific types and foci of archival data.

Table 4.3

*Observations.* It is very challenging to observe students' self-regulated learning because of the difficulty of discovering what is happening in their minds. Observable behaviors are

especially hard to detect in a virtual learning environment. The archival documents help to partially resolve this problem by providing records of virtual interactions (e.g., email communication, online discussion). However, judgments about students' self-regulation still have to be made through inference. Nevertheless, observations were useful for me as the researcher to gain a sense of the overall learning atmosphere in the online course and of individual students' engagement, effort, and motivation. Developing this sense assisted me greatly in data analysis and interpretation. In terms of observation procedures, I did not use any observation protocol but recorded important events in my research journal. In relation to students learning about evaluation, I took the role of an "onlooker" (Patton, 2002, p.265) as I did not personally engage in the learning activities as the students did during my observations.

In summary, Table 4.4 presents the data collected methods and sources for the three iterations. Table 4.5 illustrates how these data collection methods are aligned with the research questions of the study.

Table 4.4

Table 4.5

## **Data Analysis**

### *Data Analysis Procedures*

I used both individual case and cross-case analytic techniques (Stake, 1995; Yin, 1994) to analyze data in depth from a total number of 16 students across two semesters. I did a preliminary analysis of the data from the third semester but decided to only report the results from the first two semesters due to the many similarities between the second and third semester findings. Using a constant comparative method (Glaser & Strauss, 1967), I first began a search for patterns within the data of each student individually and then expanded this search across the

data for all of the students. I used an inductive analysis approach to examine the primary qualitative data, as this approach allows for the identification of meaningful themes and patterns in people's experiences (Patton, 2002).

In-depth data analysis followed the procedures recommended by LeCompte (2000) and her colleague (LeCompte, Preissle, & Tesch, 1993), i.e. tidying up data, scanning, taking notes, finding items, creating sets of items, and assembling patterns. Overall, the data analysis activities were focused on three steps: data reduction, data display, and conclusion drawing and verification (Miles & Huberman, 1994).

My general strategy was to base the qualitative data analysis on categories determined by the research questions. For example, when coding student interviews, I took notes to capture the main ideas of various chunks of students' statements, compared the notes across participants, and sketched a general picture regarding each question. Additionally, I utilized Zimmerman's key SRL constructs (Zimmerman, 1986, 1996, 2000, 2002) as a framework to guide my coding of data related to students' SRL processes and strategies. A version of the initial coding framework for this research project is illustrated below in Table 4.6.

Table 4.6

In organizing the massive amount of data from multiple sources, I used three tools including MS Word, MS Excel, and Survey Monkey (<http://www.surveymonkey.com>). All the student interviews and the instructor interviews were transcribed in Word. The data analysis function in Survey Monkey allowed me to download the survey results as Excel files. The management of archival data were mainly done through the use of Word. Specifically, I summarized the students' quiz results in Word documents. I also took notes about their online discussion participation in terms of frequency and substance instead of doing an in-depth

discourse analysis because this data source served as a secondary source to confirm or refute findings from student and instructor interviews. The same applied to other archival data, including group project deliverables and group wikis. The course weekly outlines, discussion postings and wikis as they were presented on the Moodle site were saved as PDF files. The course materials, such as course syllabus and rubrics were also saved in their original forms.

The specific data analysis I followed to analyze data from the first two iterations were as follows:

*Chunking.* I created a document for each interviewee, comprising interview transcripts from all three interviews, a summary of various survey results, and my observation notes for that particular student. I read each document a minimum of two times to develop a general understanding of each interviewee. Then, I divided the overall document for each interviewee into four different documents (by research question)—one for the participant profile and motivation, one for self-regulated processes and strategies, one for environmental influence and challenges, and one for support. Then the data related to different research questions was organized a little differently. Taking the file for profile and motivation part as an example, it was further organized by profile, goals, task value, self-efficacy, motivational change, and motivational strategies based on the questions posed during the interview. Contents related to these different parts were copied and pasted accordingly. Similarly, SRL process and strategy document was further organized into different parts (planning, time management, environmental structuring, monitoring, etc.). The organization of environmental influences files and support files was less complicated.

- *Coding.* The motivation and SRL process documents were coded for each interviewee. I broke down the data into the smallest information units (i.e., words, phrases, sentences,

or paragraphs) and labeled them according to starting list codes. Data on emerging constructs that were not readily classifiable were temporarily assigned an “Others” code for further analysis. For the coding for environmental influences and support, all the contents on each interviewee’s document were put together, resulting in two overall documents named “environmental influences” and “support.” I then began open coding for these two research questions directly.

- *Grouping.* After the coding was completed, the coded units for all the interviewees were included in a number of final reports for initial codes.
- *Pattern Identification.* All units in each group (for research questions on motivation and SRL) were further analyzed using open-coding procedures. I used interviewees’ words, my own words, or theoretical constructs of this study to capture the patterns in each group. Some units, especially those temporarily coded as “others” were moved to another group where they fit better. I revised, added, combined and deleted patterns until they covered as much data as possible.

I then continued to compare and contrast patterns in order to identify themes and regularities and finally drew conclusions. During the whole process, to confirm or disconfirm what each student shared in their interviews, I also carefully examined the instructor interview transcript, their peer’s ratings and comments in peer and self-evaluation surveys, which sometimes led to very interesting findings. For example, Irvin reported a clear learning-oriented goal in his initial interview. However, his comments in the following two interviews indicated his strong concern to get the project done in time and less emphasis of doing the “right” thing. This observation was confirmed by the complaints from his teammate, Laura, in both interviews and the peer and self-evaluation survey, indicated that she thought Irvin was a good project

manager but had not contributed much to the team cognitively. These types of revelations helped me to better understand the students' SRL with more accuracy.

### *Validity and Reliability*

As with all other research studies, this design study must provide evidence of its trustworthiness by addressing internal validity, external validity, and reliability. According to Merriam (1998, 2002), internal validity concerns how results match reality while external validity deals with the applicability of the findings from a study. In a study primarily using qualitative data collection methods, reliability is more about "whether the results are consistent with the data collected" (Merriam, 1998, p. 206). Therefore, I have approached these issues by applying several strategies as follows:

- *Triangulation* at both data and investigator levels (Denzin, 1978; Patton, 2002): As specified previously, I collected data from a number of sources and examined what materializes from the convergence of the data. Additionally, I worked with a team of researchers, which helped to improve the validity and reliability of the data analysis and interpretation by ensuring inter-rater consistency.
- *Field test*: Design research's inherent advantage of enhancing validity stems from its integration of learning environment design with empirical exploration of environment and how individuals interact with the environment (Hoadley, 2004). In this sense, the ultimate test of the reliability and validity of my study has been the creation of a refined online learning environment that supports effective SRL as well as a set of design principles applicable to other instructional situations.
- *Documentation*: As Hoadley (2004) suggested, I sought to establish the rigor of the study by documenting my (the researcher's) subjectivity as well as the circumstances and

processes involved in decision making during not only course design and implementation but also data collection, analysis, and interpretation. Here I used rich, thick descriptions to help readers understand what actually happened and to what extent they can apply the findings to their own situations. Moreover, all research instruments and procedures were tested in a pilot study and revisions were made to ensure their reliability and ability to extract salient data.

### *Researcher's Perspective*

As both a previous student of and a teaching assistant for the E-Learning Evaluation course, I was quite familiar with the course. This, on one hand, enabled me to better understand the learning process from the learner's view and the course design from the instructor's view. On the other hand, my previous experience afforded me insights into the ways design interacts with research needs in my own research context. Meanwhile, I had also been exposed to different types of online learning environments in various capacities, which helped me understand the benefits and pitfalls of online learning as well as how students' learning could be affected by technological, pedagogical, and social elements. I believe that online learning has provided an important alternative platform for learning to take place in this information age, but its potential cannot be fully tackled until it is thoughtfully designed and implemented.

As both a learner and an educator, I subscribe to constructivist learning theories, believing the individual learner has a role in knowledge construction as meaning making through interpretation of personal experience (Crotty, 2003). I also believe in the agency of the learner and the importance of the learner's interactions with cognitive and social contexts during the learning experience. My own teaching and learning experiences have convinced me of the great impact of self-regulated processes on one's learning outcomes. As an international student, I

inevitably approached the pedagogical considerations in American universities from my own perspective, influenced as well by my personal experience in how the design of learning environments influence foreign students' learning and self-regulatory processes in various ways. As a researcher, I adopted a pragmatic view on the selection of research methods and tools, focusing on utility, action, and the fit between theory and practice. As a doctoral student, I was clearly aware of my limitations due to my perspective and experience and I strove to learn as much as possible through this research endeavor.

### **The Process and Results of the First Iteration (Spring 2008)**

#### *Process of the First Iteration*

The E-Learning Evaluation course that was the focus of the educational design research study was offered as an elective graduate level course for both doctoral and masters students in the Instructional Technology program at the researcher's university. The course was designed to help students develop an understanding of the theory as well as specific skills related to evaluating technology-based instructional products. Over the past 15 years, the course, originally titled "Instructional Product Evaluation," was delivered in a traditional classroom setting where students met each week during a 16 week semester for presentations by the instructor, various learning activities, and group work related to the product evaluation that students planned, conducted, and reported in small teams. When offering the course online for the first time, the central pedagogy remained the same as in the previous face-to-face offerings in terms of the use of authentic learning tasks (Herrington, Reeves, & Oliver, 2010) (see sample syllabus in Appendix B). Working in teams of 2-4, enrolled students were expected to plan an evaluation for a real world client, implement the plan, and write up a final evaluation report with

recommendations. Planning, conducting and reporting this evaluation was the primary course assignment, worth about 70 percent of the final course grade.

After the instructor sent out course information via email to multiple domestic and international universities, a total of eleven students from six institutions in four countries (Australia, New Zealand, South Africa, and U.S.A.) enrolled in the first iteration of this online course. Except for one student who was not enrolled in any degree program, the other students were all graduate students in an Instructional Technology related major and took this class as independent study at their universities. In order to accommodate the students outside of the U.S.A. with different university schedules, the first course offering ran from February to May 2008.

In designing, implementing, and investigating the first online version of the course, the main focus was to test its viability and gather formative data for future improvements. Course structure, activities, resources and tools were crafted based on the design principles collected from the literature to facilitate students' learning about the topic of evaluation as well as their self-regulated learning actions. The instructor and two doctoral students serving as instructional designers and co-researchers developed and set up weekly study modules in Moodle (as shown in Appendix E), a free Course Management System. I was one of the doctoral student co-researchers, and my focus was on self-regulated learning. The other doctoral student co-researcher focused her research on optimizing group work and collaboration within this online learning environment (Oh, 2010).

The course was delivered asynchronously and originally planned to last twelve weeks, but it was extended to 16 weeks due to various circumstances later in the semester. Each week, the students accessed the course readings and narrated PowerPoint presentations from the

instructor to learn concepts and theories of evaluation as well as practical guidelines for conducting an actual evaluation project. They then participated in weekly discussions in Moodle course forums to share thoughts and questions about the readings, lectures, and their projects. The course also provided Moodle-based collaboration tools for groups, including group discussion forums, group chatting rooms, and group wikis for asynchronous discussion, synchronous discussion, and collaborative writing and information sharing, respectively. For this first iteration, the instructor assigned students to heterogeneous groups in terms of cultural and professional experience. The students were assessed based on the evaluation plans, final evaluation reports, as well as their participation in online discussions. The instructor interacted with the students via private, group, and class email, course news forums, and weekly discussion forums. The instructor also played a role in the students' evaluation projects by introducing them to their clients, facilitating the communication between the students and the clients when deemed necessary, and mentoring the students during the evaluation project period. In the middle of the semester, the students filled out an online survey about their evaluation planning process so that the instructor and co-facilitators could provide necessary assistance or intervention. After completing the group projects, they participated in an online peer and self-evaluation survey to reflect on the collaboration process and to provide a basis for the instructor's overall assessment.

#### Findings of the First Iteration

*Participant Profiles.* Three students who had not actively participated in the course activities after a couple of weeks into the semester were advised to drop the course. Among the remaining eight students, five gave consent to participate in this study. The Student Profile Survey (Appendix D), administered at the beginning of the course, provided background information on the participants, such as location, major and program level (if enrolled in any),

job (if any), previous online course experience, technology skills, motivation to take the course, and confidence level. As shown in Table 4.7, two of the three older female students who held full-time jobs were enrolled in a Masters of Instructional Technology program. Two other students aged between 26 and 45 were international students working on their doctoral degree in Instructional Technology full time at the time of the research. All students were fairly skilled with technology and reported high levels of confidence in their performance in the course. With only one student reporting knowledge learning as the primary motive for taking the course, the other four students indicated job application related motivation or a combination of the two. In terms of previous online learning experience, three had taken a few online courses, one had taught online, and one had both taken and taught online courses. The only non-degree seeking student worked full time leading online programs in a U.S. university.

Table 4.7

The participants' opinions of the positive and negative aspects of online learning revealed some different perspectives. In all, convenience and flexibility were most frequently identified as favorable aspect of online learning whereas communication and administrative issues were a common concern (see Table 4.8). Noticeably, these five students from three institutions and representing two groups worked in three different countries, which had greatly contributed to their unique learning experience in this course. All the names used in this research are pseudonyms.

Table 4.8

*Research Question 1. How is the motivational aspect of the students' self-regulated learning evident in this course?*

Analysis of interview transcripts and a series of surveys discovered fairly positive motivational beliefs among the research participants. In terms of goals, students participated in the course activities with first specific objectives that focused on learning, second, application of knowledge and skills on projects/jobs, or a combination of both. They perceived the course tasks as very relevant and helpful to achieving their goals. With one exception, most of the students expressed high levels of self-efficacy in performing well in the course and reaching their goals. These positive beliefs became a strong drive for them to work hard to meet course requirements despite all kinds of difficulties that arose during the duration of the course such as illnesses or the death of a loved one. However, the students did experience changes in motivational states throughout the semester, which inevitably influenced their learning experiences to a certain degree. Students responded to these changes by using a variety of strategies to regulate their motivation. Table 4.9 presents a summary of findings about students' motivation aspect of SRL in the course.

Table 4.9

### *Goals*

Overall, the students had learning-oriented goals, which are seen as a manifestation of intrinsic motivation. Even though quite a few students aimed to apply what they gained in specific job related activities, learning as best they could in the course was instrumental for attaining their more specific objectives. The reported goals were all related to gaining knowledge and skills in evaluation and explained how such knowledge and skills could contribute to their professional development and readiness for jobs.

When the course tasks and assessment were originally designed, the course instructor and co-researchers had assumed that graduate level students tend to put more attention on the actual learning gains than on performance indicators such as grades. May verified this assumption when she was asked about her thought towards final grades:

It's always nice to get a good mark but I think oh I wouldn't consider that as that high a motivator. You know especially at this level of study. I think there are a lot of students motivated for other reasons.

“The other reasons” as revealed in this study were either acquisition of evaluation knowledge and skills or direct application of such knowledge and skills to meet demands in their actual jobs. Quite obviously, the two doctoral students focused more on academic learning of evaluation knowledge and skills. Irvin became interested in this course because he was working on a thesis also related to online learning:

[The goal is] to deal with my evaluation skills further. During my MA it was on evaluation and [inaudible]. I thought it would be much better for my thesis as well because my thesis is about developing an online environment for language learners. So I took this course would be beneficial for my studies as well.

Laura's participation was more of an exploratory effort out of curiosity. Since she was studying in a program which she did not feel 100% satisfied with, she took this opportunity as an adventure to see and try something outside her doctoral program. A professor's recommendation and the reputation of the course instructor also played a role in Laura's enrollment decision as she aspired to prepare herself as much as possible for the fast-changing world of instructional design.

But I was a little bit mixed about the course ....I am in the doctoral program here at [university name]. And the program sort of...me. I felt that I have more ambitious I don't know how to tell that just I am more curious and maybe have like more study. I know at my university and my expectations and I really want to try something different at another university and I think evaluation and instructional design it goes together and it just confidence for me too.

.....it may be several things if was offered from another university and my professor thought it was a good one....that I need to know how to emulate learning to be an instructional designer or professor and I was very curious it is a new field for me and I think it is good to have confidences quite quiet even though scattered because you never know in the world what you will be doing and what will be ..... because everything changes that fast.

Because it was an adventure to get different from better university and with somebody who's mature to his field.

The other three students' goals for taking this course were more or less related to their job activities. Amy was a full-time high school computing teacher with a personal interest "to make an online course for my students to help them with their study." This project would involve converting a face-to-face course (with some online learning) she was teaching to a completely online one using Moodle. In order to make a really good online course, she thought it necessary her to understand evaluation and this course arose as a perfect opportunity. Amy clearly stated that her goal was to "putting what you learn into practice---what is the point in learning it if you don't?"

Judy worked as an Associate Director for Evaluation at a public U.S. university. The reason for taking this course was self-explanatory and she hoped for direct application of what she learned to her work. May worked as an Educational Designer at an Australian university while finishing off her Master's program at another Australian university. The subject of evaluation was very in line with what she was already doing at work and was thus "very authentic." As a result, she saw the course as "an opportunity" and was expecting "a chance to practice these ideas within my own work."

### *Task Value*

Without any hesitation, four students commented that the course tasks were relevant to and helpful for achieving their goals whereas Laura gradually felt the relevance of those tasks as

she got more into the course. With specific projects for application in mind, Amy and Irvin knew clearly how the specific tasks could be helpful for their own areas of application. Amy described the course tasks as “incredibly helpful” and explained how her course experience had assisted her to better understand what she asked her students to do:

The first task for one of my courses is for the students to make a survey and analyze the results. And I hadn't realized what I was actually asking them to do. Now that I have had to go through the process myself I understand that it is a lot more intricate. And I have begun making an online course for my students using a lot of the things that I had gleamed from the other students who are also doing this course.

She also added:

It [The course] has been incredibly useful... by from what [instructor's name] has been showing us giving us whatever and also what I have learned from being in an internet based course and in the content of the course. So I have learned from many aspects not just the content.

Irvin related the course work to the development of authentic learning environments he was going to design for his students and thought this course would help regarding the evaluation of these environments, although it would not be as helpful for the design part. May reported in the Self and Peer Evaluation Survey that she had learned a lot and applied the course learning when she surveyed three student cohorts and interviewed/surveyed twenty one lecturers as part of a formative evaluation for a new program at her work place. In the final interview she also mentioned she had gained a better sense of how to put together a strong evaluation plan. In addition, she believed that her experience working with clients in this course was transferrable when she worked with different kinds of clients on her job. May concluded that “it was nice to see how the theory helped sort of meet the road.”

Laura was the only one who answered the task value question with reservation. When she was interviewed for the first time half way into the semester, she had started to perceive the tasks as “a bit more useful.” She attributed this to her beginner status on this subject and admitted that

the course was different from what she expected. Unlike the other four students who either had job-related activities or personally-initiated projects that involve evaluation, Laura seemed to be more used to academic learning, which might have led to her differing perception of the authentic tasks mentioned above.

### *Self-efficacy*

The five participants were asked at three different points of time during the semester about their self-efficacy belief, namely, their confidence in doing well in the course and achieving their goals. The participant profile survey which was administered at the beginning of the course offered students' responses in the form of ratings. All rated their confidence level at 7 out of 10 or above. Although the same scale was used, this self-report numeric measure without any explanations from respondents did not reveal which students were more or less confident than the others. It was only safe to say that the participants were fairly confident at the very beginning. The interviews, however, gave a "chronological" view of the students' self-efficacy and provided a better understanding of how confident they were at various times and how their confidence had changed along the way. Overall, all students started off the semester with much confidence. Their confidence dropped, to various extents, in the middle of semester and then increased again later, especially towards the end when they got close to completion of the evaluation projects. Affirmative and positive feedback or outcomes was identified as an important confidence builder.

May seemed the most confident one throughout the process and experienced the least fluctuation in self-efficacy. The practical side of the course made May feel confident and excited from the beginning. During the semester she got "slightly anxious because there were a few weeks there where there wasn't much happening online," but soon "the sort of momentum has

come back and everything is ok again.” Her confidence mainly came from applying ideas from the course to her work place and receiving positive feedback. May thought it was fair to describe her confidence over the whole period as stable.

Although she only rated her confidence as 7 out of 10 in the profile survey, Amy showed much more confidence in the interviews. Her confidence came from past course experience and the prospect of finishing her degree program as she claimed “100%” confident about achieving her goal because this course was her “last subject” in her master’s degree. At the end of semester, Amy felt very satisfied with herself as she either achieved the things she initially wanted to achieve or “could see the possibility of achieving them.” Nevertheless, there was still a moment in the middle of the course when she thought she “wouldn’t be able to do it because there was so much to learn.” Then as Amy got more into the course her confidence picked up:

I think I didn’t really understand the whole course until when I was working in the middle and then uh it became more obvious that as a team we could get it together. I don’t think it would be a good course on your own.

In Amy’s case, working in a team bolstered her confidence to complete the final large course project and meet course requirements.

Judy had to suspend her course activity for two months in order to take care of her sick mother. Due to availability reasons, she was only interviewed once at the end of semester. Her very firm and positive response in the final interview echoed the 9 out of 10 rating she gave herself about confidence level at the beginning, which means she did eventually achieve her goals in the end regardless of her circumstances. However, Judy admitted that she was not confident that she had contributed to the group work “to the extent that I should” and could have done better if her family situation were different.

You know I had that I wasn’t a strong participant for a couple of months with the class because of my mom’s illness. And I, I made five trips up to Buffalo in the past two

months and I didn't have access to internet for those times and it was distracting because my mom was so sick. So that hindered my being able to meet my personal goals in the course. You know in a different time I would have been in stronger participant and I wouldn't have been distracted and I would have had more time to put in the course.

While Irvin gave himself the highest confidence rating (10 out of 10) in the student profile survey, he commented in the first interview that achieving his goals was much more difficult than expected because of all kinds of complications including time difference, communication breakdowns, and people's personal issues:

I think I'm going to achieve my goals but it is much more difficult than I expected. Because of the time difference and people have some private issues if you remember from the green team. One of our teammates got married and the other one had some funerals and also I had some problems as well I had some breakdowns in the communication with the team. So that made it really difficult. I mean more difficult than I expected. But I am achieving my goals I mean the course is really useful.

By the time of the second interview, Irvin felt more confident as he already understood the steps to follow, identified the issues in work process and tried to deal with them. He further pointed out that the enhanced self-efficacy and experience would help him do a better job on future projects of a similar nature since he would be able to "predict some possible problems and some possible stages I will have to go through, and get myself prepared much better."

Among all the participants, Laura presented herself as the least confident student with a lot of anxiety. She was worried about inadequate knowledge and skills at the beginning of the semester and constantly thought her peers "more competent." In addition to lack of prior knowledge, as an international student with a mother tongue other than English, Laura was also concerned about her language skills when she communicated with the client and worked on the project deliverables. The course activities were "challenging" to Laura. With self-set high standards, she expected herself to "work far better" and felt disappointment when she self-assessed herself as "not as good". A few weeks later, the instructor's positive feedback on

assignments that Laura's group submitted obviously encouraged Laura, making her think "maybe I expected much more difference in the beginning" and "when we got assignment I felt that I'm not too bad". Laura also sometimes used a strategy to enhance her own confidence by keeping working on the task:

When you have no help, no one there, and you need to solve by yourself and you feel that you just need solve by yourself and get the answer.

At other times, she chose to move on after having done everything she could:

Another thing, you know that you need to move on and you make easier when you .....find your sources your reading and you do what you can do, and you feel that you did something. Maybe you are not satisfied, but then you get feedback from team members or from professor, which is not too bad. Then you think that maybe it's not too bad.

In retrospect, Laura realized that excessive anxiety hindered her learning. Trying to be more open and focusing more on things she could do helps her confidence grow. As she acquired more knowledge on the subject and getting affirmative feedback from people in the course, her self-efficacy developed naturally.

When you are reflecting back you know you see that it , it, it uh that you didn't have confidence and how impeded you at the beginning, how it's didn't bring anything good...confidence changed because I realize that, you know, if you are not confident too much it impedes your learning. It takes time. It have changed interacting with client and [instructor name]. It have changed interaction with group too.

Then I am more confident uh that I can do that. In the future I will be doing that I will be more organized and will have less fear.

When you take the course and you was doing things, and you know the confidence is building and the knowledge are coming.

You can do that. You can do authentic project even if hard one. You just need to organize well, and you know, be open and be not afraid to interact with... you know, ask questions .... Be more open and determined and interact with client, and seek for help if you feel that you don't have this competence. I get confident that you can do many things You just need to. You need to be in group work, have mentors ... that's my finding for this course.

### *Motivation Change*

Other than changes in self-efficacy discussed above, Irvin, Amy, Laura, and Judy also reported changes in their general motivation. Again May was the one who reported very stable motivation for the same reason she mentioned—“finishing up the Masters program” and “had enough motivation anyway.” For those who did experience motivation change, personal issues, course or learning-related issues, and technology issues were all demotivating factors.

*Personal Issues.* Personal life situations negatively impacted this cohort of students as the number one factor. Many have gotten used to the reality that adult learners all have many roles to play in work, family and social life. However, tough situations that don't always happen happened to quite a few students and even the instructor during this course iteration. Irvin had some family health problems and had to move from Australia to Cyprus in the middle of the semester; Amy had three deaths among her family and friends, which forced her to leave the course for several weeks; Judy's mom's illness prevented her from participating actively in the course activities for the majority of the semester; another student who didn't participate in this study had a wedding during the semester and was “absent” for an one-month honeymoon; the instructor also lost a family member on top of a demanding international travel schedule. Since the collaborative evaluation project was the essential activity of the course, virtually everyone was affected by these circumstances, although some did not have to deal with the actual matters or handle the emotional stress themselves. The loss of time and focus and the ensuing anxiety and stress were shared among all the class participants. Needless to say, the students who directly experienced these issues struggled to keep up with the rest of the class.

The personal situation definitely overwhelmed everything. Cause at the end of the course as well as having to deal with two deaths at the end of the course I had a friend who died on top of the deaths I already had to go through. (Amy)

As I said there were some personal issues which prevented me from keeping my motivation really high. (Irvin)

That's really influenced by my family situation. It was just real hard to be as motivated as I normally would be. (Judy)

When I was up in Buffalo I actually could not get online. My system wasn't on the computer and I would take my laptop with me but I was trying to do it through a phone modem which just simply wouldn't work. And I was very frustrated at that point. And I didn't feel like I could go to a coffee shop and connect because I was there to help out with my mom. So for me to take off wouldn't have been accomplishing my whole reason to be there. I really needed to be present. (Judy)

*Course or learning related issues.* Irvin, Laura, and Amy reported that their motivation was affected by course activity related reasons. Beside personal problems he had to deal with, Irvin was not very satisfied with how his group worked together. The difficulty of the course task also made him sometimes doubt whether he would be able to do it. But overall, Irvin described his motivational change as "not too big." Amy concurred with Irvin on the unsmooth nature of her group work as a demotivating factor. She got very upset when she discovered that she and Irvin had worked on the same section of the evaluation report due to ineffective communication or coordination. Amy also shared that there were moments when she felt "unable to move ahead because I couldn't get my head around what it was we were trying to achieve." Fortunately, "a breakthrough" thereafter motivated her again. Laura's motivation change was reflected by her shift in how she approached the work:

At the beginning I was more motivated to do by myself as much as I can and then I was less motivated and I wanted them to do.

Although Laura's confidence gradually grew as she gained more knowledge and the project moved along, she felt very rushed in preparing the final project report, and thus she left the course with much disappointment with the quality of her work.

*Technology Issues.* One additional demotivating element for some students was technology breakdowns. Living in countries with limited Internet access, Irvin and another student (non-participant in the study) struggled throughout the semester to get on the Internet for course participation. Sometimes spending a whole night trying to open an email message and download a file, Irvin constantly fought with a troublesome Internet connection, which considerably hampered his motivation and learning. Lack of contribution from another student limited by inadequate technology access, as a result, made it even more challenging for the rest of his team to progress.

### *Motivational Strategies*

When the students experienced motivation drops, they all used various strategies to encourage themselves in an effort to meet challenging course work enthusiastically again. The strategies that the students used fell into four categories: using commitment as a motivator, self-talk, engaging in conversation, and striving for quality.

*Using commitment as a motivator.* All five students emphasized their responsibilities to contribute to their group and felt they were obligated to do their best to avoid disappointing any stakeholders. In her interviews, Laura repeatedly mentioned “responsibility” and “I cannot leave them” even when she did not feel quite motivated. She further explained that her care for “the group” and others was not limited to this course and she would do the same for her friends in life. According to Laura, being “empathetic” was part of her personality, implying a tendency to be helpful in many situations. Amy and Judy had very similar comments on responsibility:

And the thing that I do is (that) I feel an obligation to the client, an obligation to the team members and when I am able to join back in I feel that they are quite important so therefore I get motivated again. (Amy)

Telling myself that you know I’m not doing something just for me but it’s for a team. And we can’t let the team down. (Judy)

With all other members having something going on in their life, May's group work was virtually her one-person show. She managed to complete most of the work with fairly good quality without too much help from her peers. Regardless, May showed understanding to her teammates and explained her motive for being persistent and hardworking:

I mean it's a little challenging for them to finish the project on time...I don't know that I had any strategy as such other than working to the deadline. But I just... yea... what can you do under the other team members had reasons? They entered it with good faith and then they just couldn't sort of finish it. So uh that's just how it had to be.

On the other hand, her dedication to serve the client and her drive to prove the value of their group project helped too:

[Client's name] sent an email saying he was going to a meeting. So you know he really wanted to present our report I thought that is just too good an option for me to miss, so I just worked towards that deadline.

Different from other students, Irvin had a special reason to do a good job; that is, he would meet the course instructor in person at an international conference soon. Since he enrolled in the course through the help of his advisor in Australia, he also felt the pressure to complete the course successfully. To Irvin, to avoid embarrassment or disappointment seemed a big part of his motivation.

*Self-talk or self-encouragement.* Four out of five participants reported telling themselves things they thought important to improve motivation and to better engage in the course work. At times of distraction, Amy and July both reminded themselves of their original intention or goals for taking the course:

My focus has been a bit distracted because I had to deal with two deaths one in my family and one a very close friend. That made it even more difficult to become part of the group. But I just kept perceiving- because I was interested in the content and I wanted to learn more about how to do it for myself at work...I was interested to learn about online evaluation online learning and how to apply it to my schooling. And when I could gather

my emotions sufficiently then I would just learn it again. Cause that was the point of doing the course in the first place. (Amy)

You know I think...pep talks to myself. I don't know how people would how other people respond to that question. Uh I think by just reminding myself why I was taking the course. You know things like that. Also remind myself that it you know there is an end to it. There is an end in sight. And then I can go back to having more time on the weekend. Cause that was very important for me to take the course. So it just like my own pep talk. (Judy)

Irvin's pep talk, however, was that "this is the last course for me," which can also be classified as working towards goals.

Another type of self-talk is presented in the form of self-encouragement when the participants told themselves to persist. Laura and Irvin both shared instances when they simply ploughed through.

If you didn't do well that and that I think try not ever, ever lose that hope and try to work...I will just do my best until that point, because it is part of learning. How much I will do, that much I will learn. Another like grade... what the grade will be just not doing that? I think just doing (until) the last moment as much as you can. It tells me not to give up. Just so the challenge to meet, just do it. (Laura)

Probably I used my timeline, and I try to give myself some time to read and continue. And when my motivation level changed because of the task difficulty, I try to sit back take a deep breath, read the task again, read the sources again and keep going. (Irvin)

*Engaging in conversation.* The third type of motivator is engaging in conversation with people in the course and the encouragement thereafter. Laura reported that feedback and support from the instructor kept her motivated and optimistic. May reflected that staying in touch with people kept her moving forward. Other than the "communicative" instructor, the "fantastic" client for May's group was another factor that encouraged her to continue her efforts. Lastly, frequently checking the Moodle course site to interact with course content and activities helped May stay active the whole semester.

*Striving for quality.* Striving for quality work was the fourth reason that kept Laura motivated when working on the project. When she thought their work “wasn’t perfect and was so far from being perfect,” Laura looked for mistakes diligently with her mind constantly analyzing and thinking about ways to improve. While this might have helped her to remain engaged in her course work during the semester, her drive for high quality also made her disappointed in the end because of very limited time to complete and improve their final project report.

*Research Question 2: How does the environment affect students’ self-regulated learning and what challenges do students encounter?*

The environmental influences on students’ SRL were examined from three aspects: the group work, the authentic task, and other aspects of course design and activities. As the most salient features of this online evaluation course, group work and the authentic task presumably impacted the students’ learning in ways that other courses haven’t. The other aspects of course design and activities also constitute the overall learning environment where the students engage in interactions with the course materials, the instructor, and each other. A summary of environmental influences on the students’ SRL and the challenges they encountered can be found in Table 4.10.

Table 4.10

### *Group Work*

Students in the course were assigned to one of two groups, each working on a separate evaluation project for a client. The assignment was arranged based on gender, location, program level, etc., to achieve a balanced group composition. In the first few weeks, the students mainly read course chapters and supplemental readings and posted to course discussion forums. After being introduced to the clients, they started to collaborate with group members in obtaining

project-related information from the clients, drafting an evaluation plan based on the clients' goals, implementing the plan by collecting and analyzing on-site data, and finally creating a final report with recommendations for the clients. In addition to the usual weekly reading and discussion activities, the students spent more time interacting with peers and collectively building their final project by applying what they learned in theory. The communication venues included group or private emails, team wikis inside the course web site, and phone calls. Although they were strongly encouraged to use the Moodle email within the course for team communication, the students still opted to use their personal emails for this purpose. How the group work has influenced students' self-regulated learning is discussed from its impact and students' group work strategies.

*Impact of group work.* Analysis of interviews led to the following findings about the impact of group work in terms of knowledge construction, mutual support, accountability, and negative aspects:

First, group work was conducive to knowledge construction. Overall, group work was conducive to knowledge construction among students. Amy, Judy, and Laura all reported benefiting from working in a group. Amy claimed her teammates had a bigger impact than the instructor on her learning and on her opinion of what she had learned. The reason was simple — “Because we were like learning together.” In her group, Amy felt comfortable saying that she didn't know how to do something, and she would then blend suggestions from different group members and apply it to what she was doing. Amy also used information sharing with other students as a way to verify her own learning or to look for remediation. To Judy and Laura, the benefit of working in a group helped in that it allowed them to better grasp and digest the content.

In addition, Laura indicated that she learned more than just about the subject. Although she reported moments when she wanted her group members to do more work when she was low in motivation, she nonetheless realized that in group work the responsibility should fall on every member instead of any individual alone. Laura also vicariously studied leadership by closely observing how Irvin played his role as a team leader and manager. Working in a group for such a project for the first time, Laura started to reflect on how what she had done had impacted the overall work. Due to her inquisitive nature, Laura even learned about grammar from team members who proofread project deliverables. In all, this experience helped her not only to gain exposure to both the idea and practice of group work, but to also understand the nature of evaluation from many different perspectives, which she said “I wouldn’t have learned by myself.”

Second, all participants reported being supported by one or more members from their groups. For example, Judy was particularly appreciative of May’s contribution and support without which her group would not have succeeded. She mentioned twice in her interview that May did a good job motivating the whole team. According to Judy, May not only “did way more than her share of the work on that project, but also was real supportive of the contributions she was trying to make herself. For Judy, the thought that everyone is doing some work itself brought her a feeling of support.

While Amy had to take a long absence from the learning portion of the course due to her unfortunate family/friend situations, the team continued to send her emails, which made her feel part of the group and later returned to the course with a high motivation. With so much to learn and do for the project, Amy admitted that she wouldn’t have been able to finish if it were not for

individual students. Even May, the one who was there the entire semester and did the bulk of her group's work, felt supported when someone else worked in her area of weakness:

I know like very early on in the report Judy went and did all the numbers, which is like my least favorite thing to do, anything with numbers. So that was really good. I think you, you know, you can pick up on each others' weaknesses and strengths so uh that was good.

Even Irvin, who thought he had not got too much support from other members of his group, didn't forget to mention Laura's strong support— whenever he needed anything, Laura was always there to give a hand.

If I had a question in my mind from the information can be gathered from our client Laura provided that support. So she was always in touch with our client and getting the answers of the questions that we had in our mind.

Third, working in a group makes every student accountable. Such accountability is reflected by an enhanced sense of responsibility as discussed in previous motivational strategies section, serving as a motivator among this group of students and helping them meet course requirements. Judy thought she tended to be more "disciplined" because she was responsible to other people, not just to herself. Laura realized that she needed to better meet deadlines when working with people. May said group work kept things moving along because "if you don't do it, you are not just letting yourself down. You are letting your team down."

*Negative impacts of group work.* Several participants also discussed the negative aspects they experienced during the work process. The first inconvenience was about the extra time group work takes, especially the time needed for communication. In this particular case, the fact that group members were geographically dispersed on three continents made effective communication even more challenging. In order to make the group function, the participants had to be more flexible in accommodating each other's schedules. Judy had a regular schedule to work on the course for the first half of the semester but not for the second half, since the project

that involves group communication was more time-consuming than just doing readings. She believed that synchronous meetings would be helpful for make their group work more effective and more efficient. However, this was very difficult to do with one student located in Sub-Saharan Africa and considerably limited by time difference and Internet accessibility.

Amy reported two instances of communication breakdown due to email address change and email inbox overflow. In both situations, her group had to wait for extra days to get the messages across. Irvin did not report similar circumstances but still got impatient about waiting for other members to write, respond, edit, and revise when his team worked on the report. “This has taken us a lot of time”, he said, “I would have completed tasks in a more timely manner.” He also thought working in groups made him focus more on getting the group to function and less on the quality of their product. Therefore, he preferred working in pairs even though that meant more work for each person. Nevertheless, he thought that by working in pairs the quality of the final project would most likely still stay the same or be similar to what they did as a group this time.

Secondly, Laura was not used to the feeling that she had to rely on others when working in a group. She thought group work might have impeded her learning as her members divided the task and she only got to experience some parts of the project. As a result, she missed the chance to get first-hand experience of every element of evaluation.

The third problem as reflected in ineffective group work was unbalanced work across the team and the associated stress, anxiety, and other negative feelings it caused. The numerous personal issues that members of both groups experienced along with communication breakdown affected the overall group process very negatively. Consequently, May, Irvin, and Laura became the backbone of their groups and took up more than their fair share of the work. May did not

complain about the extra work she had to do, although she would like to see more contribution from her group members. What bothered May was her feeling of being “a real bully”.

I'm not feeling overworked or stressed at all. I'm just quite happily working along and like I said, I do believe [team member's name] had some problems with the technical things. But I thought” well I'm not going to stress it I'll just keep uh working toward the end and finally we have a great client. Our client is really supportive. And that makes a lot of difference.

I have this fear as being seen as someone who has taken over and hijacked the project, and I don't want that to happen. So that's why I sort of keep reinforcing with the email saying “.....get in there; this is for all of us and if I've done something wrong, tell me”.

But I'm a little disappointed. I don't want to take over and dominate this process, but the activity (see history) in the wiki is getting me down. I feel as if I'm almost on my own at the moment. (Response in the Assessment of Evaluation Planning Process survey)

Judy, May's teammate, also acknowledged in the Assessment of Evaluation Planning Process that “As in much team work, the contributions are not balanced.” The same issue occurred in the other group, resulting in an increased stress level for Laura and Irvin.

*Group work strategies.* In an effort to learn about the subject and meeting course requirements, the participants used several types of strategies to collaborate with peer students: asking questions and listening to others, doing their best when participating with others, interacting more with people of similar background/culture, establishing a personal relationship with group members, and implying a point instead of speaking explicitly.

First, the group members used asking questions and listening to others an important strategy for collaboration. When working with others, mutual respect is the key. Amy, Irvin, and May provided specific examples when they asked questions or made suggestions during group work. They also paid close attention to what other people had to say. It was very natural for Irvin to ask whoever he worked with (instructor, fellow students, friends) questions to start the

interactions. Amy always checked with group members about their opinions when she tried to propose any ideas or make suggestions:

I would say I had an idea, I'd make a suggestion and say what you think. And I wouldn't act on the suggestion until I had a response back. I was always talking to my peers. I would ask their opinion and then perhaps modify it to suit what my team members were saying or what the task required of me.

May made sure to ask for team members' preferences before delegating tasks. She was also very attentive to the client's needs. In one instance, May's team administered a survey for their project using the survey tool provided at the client's institution rather than using the instructor-provided tool as originally planned. To deal with time constraints when working on the project deliverables, Irvin took the listening strategy further by going with whatever other people proposed to expedite the asynchronous discussion and move the project forward.

It was going to take us too much time and probably we wouldn't be able to meet the deadline of the course. So sometimes in order to be time efficient, my strategy is to keep silent and keep going. Rather than let's change this and let's change that... because when you are four people working on a project, there should be so many opinions and if you wait... because of the time difference if you had to wait a day to get the others' opinions, you need too much time for that.

Second, another identified strategy was to do their best while inviting others for participation. As discussed earlier, the workload was distributed among group members unevenly, so that members in both groups participated in the projects but to various extents. What the more active students did in these situations was to keep applying their best efforts to the project while simultaneously inviting or waiting for peers' contributions. For example, May explained how she persisted by working on the group wiki, indicating that knowing the client would be reading it was a motivator for her.

I just kept working in the wiki. Cause I thought, well, maybe they will come back or maybe...Especially [a member's name] I wasn't quite sure. I know he had problem with Internet connection in South Africa, so I wasn't quite sure. And Judy started in the

project and in the evaluation. But I just kept working the wiki. And I know Chuck was reading it as we were building it as well.

In general, May did her best in working to the deadline throughout the semester and showed understanding to peers whose studies were interrupted by various circumstances. Similarly, when working on the final project report, Laura took the initiative to “put everything together” so as to present an opportunity for others to “jump in.” Amy sought input several times before making changes on the wiki or project deliverables. If there were still no responses, she made the necessary changes, notified group members of what she had done, and encouraged others to make their own edits.

Laura recalled utilizing most of the group work strategies; however, the following three were used by her exclusively: interacting more with people with similar culture or background, establishing a personal relationship with group members, and implying a point instead of speaking explicitly.

Third, some students tended to interact more with people of similar culture/background. Laura and Irvin, the two international students and non-native English speakers in this course, worked with two older students whose spoke English as their mother language. It happened that the two international students collaborated closely and took the bulk of the workload. Without an appointed leader, Irvin rose to the occasion and managed the group process fairly successfully. To make the group work functional, Laura went all out to support Irvin not only by doing her part the best she could but also by being understanding and “humble” while serving as a bridge between Irvin and other members at times of conflict.

Another strategy would be that I would interact more with Irvin sort of because we have more similar cultural background. I can understand his culture better, and sometimes support him. In emails because I felt that sometimes he, he would ...was going on and sometimes he would get angry about nothing and can jump up on others peoples

somebody...I just would try to email logically and optimistically...sometimes I tell that I emailing them that I will do that and we need Irvin to know that everything is ok.

Irvin got angry, you know, and he not read personal emails. I mean I hurt... I guess he is from that country of [country name] and men are different than in our countries. I felt that I hurt but he email me that he knows everything and I not supposed to teach him. You know because he told me that many times that he understands. Then I email him I would started sometimes, I would manage the situation and I would, I wouldn't be angry and I can be small and lower. I would email him and say that I would email that for Amy, you know, implied and then he again was very optimistic.

Laura's substantial contribution was recognized by Irvin when he commented her as "the team mate to provide help and collaborate." According to Irvin, Laura was "really, really good," "useful," and "motivating to my development." Irvin also added that they contacted each other via email or Skype in order to understand the course requirements better and decide how the group should proceed.

Fourth, Laura also tried to establish a relationship with every group member by interacting via personal email. The motive for her to do so was to express her appreciation for their contribution and to know them better as individuals. When she got a sense of her peers' personality, it seemed more natural for her to collaborate or seek help:

[Team member's name] emailed me about the second language. We exchange those emails and it was much easier for me to ask her to proofread what I write. Because I felt that we had that interaction...and she wouldn't be feeling that I am making her doing things.

Fifth, Laura was inclined to imply a point instead of speaking explicitly. Probably influenced by her culture, Laura sometimes chose to share her point of view indirectly by implying what she wanted to say to avoid being impolite. In one example she shared, Laura intentionally mentioned her own family situation and responsibilities to subtly encourage another member to work as hard as she did.

At the beginning Amy would you know she is working full time and she implied she didn't have much time to work on the project. And then I would email and would write

that I am working half time and I have two kids. I emailed that I am now happy to do everything that I can. I try to politely give another example. You know, maybe she work full time but she is older and she already have her kids grown. And in this case she has, has more time. So I imply that.

Whether the other student understood her message remains unknown. However, this example reflected Laura's style of handling group communication—active yet in a subdued manner.

### *Authentic Tasks*

The main pedagogy of using authentic learning tasks proved the success factor for the course. Compared to their more traditional courses that primarily used academic learning tasks, all the students reported a more successful learning experience in this course. The fact that they were dealing with something “real” added value to the experience and highly motivated the students. The authenticity of the learning tasks impacted the learners in three specific ways, as discussed below.

Firstly, the course assignments required students to apply what they learned from the course content to the real-life projects right away. This immediacy of knowledge application and the real impact on the client's end took the students' learning experience to another level. Amy found herself more responsible because she was doing the course to “assist somebody else,” whereas in a different kind of course only she herself would feel the impact. Irvin got excited that their client would implement their evaluation recommendations to make desired changes. Moreover, May and Amy both applied the knowledge and skills they gained to their work almost concurrently. Specifically, May conducted a formative evaluation at her university by surveying and interviewing students and lectures. Amy, while the course was still ongoing, designed and taught two high school computing courses using authentic learning activities. She happily noted that her students “are not forced any more, do it for themselves and get a much broader perspective on how their learning fits into the real world.”

Secondly, the authenticity of the course impacted the learners by making them play roles that were much different from what they normally did for the “regular” courses. In addition to researching and learning, they had to do all the additional things as real evaluators do, including organizing and managing the group process, interacting with clients for information they need, doing the actual work for planning an evaluation, collecting and analyzing data, and finally reporting recommendations. Irvin and May noted that these roles involved more knowledge sharing and administrative tasks. Laura elaborated on the multiple roles she played in detail:

When you contact the client, you have that role and you need to sit and think and what you will be writing and how you will be writing. In the group, you have many roles. You need to listen to others and guess what is best for them. You need to sometimes be sort of a leader. Another role is that you need to do your work, and yet another role — you need to interact with others, and think how it will help engage somebody. Even if you are not confident and you don’t read it in the book, you cannot avoid that. You just need to find a way to do.

As Laura concluded, authentic learning tasks encouraged students to be more accountable and to thus engage more actively and think more critically.

Thirdly, the clients involved in the evaluation projects made a difference in the participant’s course experience. May’s group was very lucky to work with a very cooperative and supportive client who always responded to emails, made suggestions, and provided information and assistance in a timely fashion. May explained how this client had been helpful in specific terms:

[The client’s name] has been really good about sharing information. So he sent us past surveys and information about [the client’s university name] as well. He stayed in touch the whole way through. And he was on the wiki, he would respond to emails within a day so.

He was very, very constructive. And I suppose he had all those tools at his access and he said well he wanted to send it out via [the client’s university name] and I suppose that gave the survey that much more creditability as well. So that was I’m sure that was a good thing in the end.

He was really quick about it actually. We emailed him the questions and I think in like two days later he said right it's up. I think within a week he sent us the results. He was very quick. He sent an email saying he was going to a meeting so he really wanted to present our report. I thought that is just too good an option for me to miss so I just worked towards that deadline.

Even such a communicative client had some personal issues during the semester, which slightly delayed the evaluation project as the group struggled to get critical information for two weeks. But overall, this client successfully facilitated May's group project progress not only by providing all the assistance they needed but also by motivating the group with his interest and dedication. The other group, however, often experienced difficulty communicating with their client or obtaining information for the project. Laura and Irvin both complained about their project progress slowing down due to long delays in work turnaround and information provision on the client's part.

#### *Other Aspects of Course Design*

The student and instructor interviews as well as survey results also identified several other aspects of the course that impacted the students' learning, including the group wiki, course structure, course layout and materials, and instructor feedback.

*Group wiki.* It was the instructor and the researchers' intention to use the wiki tool on the course website for groups as a place to build evaluation plans and reports collaboratively. It turned out that the wikis had some advantage in terms of facilitating group work but were apparently under-utilized due to usability issues and technical glitches. Conversely, some students like May felt heartened when trying to build on the wiki each time, and it at times seemed like a motivating factor for her. The down side, however, was that this particular wiki tool did not happen to be very user-friendly or stable. Laura said frankly:

I wasn't excited with the wiki because other wikis outside of Moodle are more flexible and more sophisticated. This wiki is a little bit cumbersome, not cumbersome...clumsy. It requires more effort than you are used to.

This probably explains why the students updated the wikis far less frequently than expected. To make things even worse, because of some technical problems, the wiki content was deleted at one point. Although the content was restored after a period of time, this created a lot of anxiety among students and negatively affected their motivation. As Judy commented in the Assessment of Evaluation Planning Process survey, "things were going well until the wiki was erased. It has been restored, but it took the steam out of the process."

*Course layout and materials.* The participants identified the instructor's narrated PowerPoint presentations and examples of course deliverables as most helpful for them to grasp the evaluation concepts and process. The narrated lectures impressed the students not only with their content but also with the innovative way of presentation. Amy clearly indicated that she was motivated by the instructor's "clever" way of doing lectures because "he was showing that online you could do anything, according to your limitations or your creativity." May considered the online presentations her "best learning experience in the course." She even named her favorite one and explained how she could use the content for herself. May really "missed" it when the weekly lectures stopped for a few weeks because the instructor was away for travel. Another component that May thought particularly useful was examples from past students, which worked well with the readings in providing the kind of guidance that the students most needed:

Like last night I read through the evaluation plan. There is a chapter on the evaluation plan and also the example that [instructor name] provided. Because the sections are clearly identified, I think that we can map against that easily as well. (May in the 2<sup>nd</sup> interview)

May also pointed out that way the course was mapped out in Moodle was very helpful for her to organize the course activities. The chronological order to the course site made it easy to “find things,” reduced the amount of organization work she had to do and thus facilitated her study.

*Instructor Feedback.* Amy and Laura both mentioned the importance of instructor feedback. To Laura, the feedback from the instructor directly correlated to her course satisfaction. In the Assessment of Evaluation Planning Process survey, she wrote “I would fill this questionnaire three or four days before, dissatisfaction would be bigger. But we started move faster as well as we got professor feedback, so satisfaction is higher.” Laura appreciated the openness and timeliness of the instructor feedback, admitting she did not expect to hear back from the instructor right away anytime they asked. The motivational effect of instructor feedback was obviously very strong for Laura because when her group got “lazy,” “disorganized,” or “not responsible enough,” the instructor’s feedback made her feel “optimistic” and collect herself again. Like Laura, Amy was also surprised by the thoroughness and thoughtfulness of the feedback from the instructor. Additionally, her group managed to make faster progress after the instructor warned them of falling behind schedule. Moreover, the discovery of the instructor keeping an eye on the group’s email discussions struck Amy as a pleasant surprise. In some instances, the instructor either agreed with their direction or prompted them to rethink a specific area, which also was very critical for the group to meet their course objectives.

*Structure.* As the course was offered online for the first time, the instructor and the designers had to explore viable online ways to retain the essence of the face-to-face version course. Online delivery, open-ended nature of course tasks, interactions with the client, and group collaboration component made it challenging to determine how much structure would be appropriate. The differences in semester schedule and in time zones also complicated decisions

about course schedule and deadlines. The personal issues that happened to the instructor, the clients, and the students further affected creation of a firm timeline.

The uncertainty inherent with the course naturally led to a strong sense of uncertainty among the course participants. The analysis of interview and survey data discovered that the inadequate course structure caused big concerns and a lot of anxiety about project progress, group work, and content availability. May and Laura were the two students who expressed most worry about unclear deadlines and important project milestones being putting off:

I feel like we are floundering a little bit and could probably use a bit more direction. However, we now have an outline and time-line, which I believe will help. (May's response in Assessment of Evaluation Planning Process survey)

There was a while that I felt like we were slipping a bit, like each week slipping behind. Then we got to the beginning of April, and there were about three weeks with nothing on that weekly schedule and I started to get a bit anxious. But then I think [instructor name] or someone put on there you are working on evaluation project. So I'm looking at it now and it's saying May 17<sup>th</sup> is that the last week of the course? As far as the schedule goes I am a little unsure. About when we actually end and finishing off. (May's response in second interview)

I guess some clarification on when we actually do finish. I'm assuming it would be the same for everybody because we are not [client's university] students or perhaps we're not [instructor's university] students. I know like [May's institution] I am expecting our session to finish mid-June. So I guess there's that sort of speaking of schedules when two different universities have schedules that don't align, I think there is even more need for clarification. (May's response in second interview)

I was just going to say my only concern at the moment is finishing this off in time. Because I think we have sort of somehow pushed things back a bit. And I'm just wondering about the time to actually put together the report. (May's response in second interview)

I think I still miss deadlines or structure sometimes of structure itself. Maybe in some course which you have more instructions and more readings, I felt more successful. (Laura's response in second interview)

Since some of the course materials were still in development after the course was launched, students also experienced a few instances when the course materials or activities were

not provided in time. This also resulted in weekly work being postponed. May reported in the Assessment of Evaluation Planning Process survey:

We somehow seem to be slipping off the study schedule with study weeks starting later and forum posting becoming less frequent. At the moment (April 16) April 6-12 study material is still “not available.”

Judy also explained one time when the work suddenly slowed up and wondered about the reason.

It happened that she was very busy with other responsibilities at that time, so this instance actually worked in her favor:

So I was expecting... and this was like a huge relief to me. I was expecting to have “Chapter of the Week” to respond to every week as well as doing all the team work. I was really relieved that that part of the course let up.

However, at another time when she was going to travel and planned to have completed course readings for future weeks ahead of time, the book chapter unavailability got in her way of studying for the course while being away.

The lack of adequate course structure also led to students’ uncertainty about how they should go about working in a group as well as when and how to start interactions with the clients. On one hand, the instructor did expect students to actively engage in group work by taking leadership roles and initiating communication with the client as soon as possible. On the other hand, this form of learning was fairly new to the students, and the instructor’s expectations were not made clear in the first place. This, coupled by a natural tendency to step out, caused the students to spend unnecessary time hesitating and waiting, which resulted in a postponed start to the evaluation project. In the Assessment of Evaluation Planning Process survey, Laura indicated that her satisfaction was not very high at the beginning as she “really missed leadership from others.” She felt more satisfied later after she and Irvin “got things rolling.” Laura finally shared the following comments at the end of semester:

I think I, having lots things in mind, humbled too much at the beginning and waited for others to take initiative. So I am not satisfied with my contribution at the beginning of evaluation planning processes. But I learned a lot from it how to proceed in the group process at the beginning. That we need to plan very clearly who doing what and not to wait too politely for somebody to do something...and more coordinate processes as well as not to be afraid to take leadership.

Laura's self-reflection echoed the instructor's observation:

[The students] in some ways seemed to be a little passive. And part of that I think, is, you know, the inevitable reluctance people have of stepping out and saying, "Well, you know, I'll direct this thing" because everybody is waiting for everybody else to take the lead. So establishing leadership but also establishing a relationship with their client...

Fortunately, both the instructor and the researchers realized that for future offerings clarification of course expectations, the ones concerning group work in particular, should be explicitly stated early on. Some participants like Laura also learned their own lesson about how to approach similar learning tasks, and thus will be better prepared for future endeavors.

### *Challenges*

*Staying on task.* Amy, Irvin, and Judy identified staying on task as the most challenging thing for them during the course. All of them were seriously distracted from their course work at some point in the semester. These distractions included unfortunate family situations, their multiple roles in life, and, in Amy's case, job demands. Judy felt that it was generally harder to keep on task in an online course than in a classroom course because it was a challenge for her to ensure putting aside the amount of time she needed for the course on the weekend, which required "a little bit more discipline" from her. In this particular evaluation course, her situation was made even more difficult by her mother's illness and other things in her personal life. Similarly, Irvin had multiple personal events. His move from Australia to Cyprus, in particular, brought about negative changes in his Interact access, limiting his course activity in another way.

Being a father of two young kids and a member of his culture also took some time away from his study.

I have got two small kids my son is 3 years old and my daughter is 6 years old. And I had to, to spend some time with them as well. And because of our culture, we had some visitors coming in and going out, and people do not let you study as much as you want. But these are all difficulties that I had to deal with. I don't think that I'm able to as study as fruitfully.

Amy named her four children, husband and job as distractions. Sometimes the temporary things from her demanding job required much of her time. However, Amy's focus was most significantly distracted by the two deaths of a family member and a friend that made her course participation difficult not only due to time expenditure but also due to emotional upheaval.

*Communication and group-related issues.* Amy, Laura and Irvin found communication a big challenge for the group work and therefore for their learning. The causes included time lag for online communication in general, time difference among group members, undefined group roles, and technology limitations. Irvin thought being online made communication challenging because of extra time for getting feedback. This drawback became more discouraging when Irvin had questions to ask and had to email other people back and forth.

The time lag was exaggerated by the differences in the participants' time zones, which further increased the psychological distance between Amy and her group members.

The other thing is the time lag. For me the difference in time has been very weird in my head. Because I am working now, but the rest of my team members aren't working till yesterday or something like that. So I found it tricky because...I was very far removed from that. It has sort of amplified my feeling of being alone. It wasn't anybody's fault. It's just the way it happened, but it amplified it significantly.

The most difficult thing I have had is feeling part of the group. It is very difficult to establish communication or some sort of connection in this particular. And that is due mostly to a time delay. It is because they live in America or South Africa and I live in Australia. I have not experienced that before. That was a bit of a mind shift.

Irvin felt similar discomfort when he “wanted to do something and the other person was sleeping at that time.”

With Amy’s study interrupted by unexpected personal issues, returning to her group and feeling part of the community became really difficult to achieve. Even before the unfortunate personal situations, Amy missed “the fun to study with other people” because of being online. After she left the course twice and returned again, the feeling of being isolated was simply insurmountable because she had unfortunately missed the most crucial part of the work.

The biggest issue that I have was getting connected again with the team when something goes wrong, or just insuring that I am connected with the team. Because that’s the thing I struggled with for a long time to the point where I almost stopped doing the course because I was in a state of grieving sad so then it was really hard to move back in. Because the time that I left was a critical time when the team members should have all been working together, so the other team members took up the load and did lots of work and I couldn’t. I couldn’t catch up to where they were at.

Laura attributed the difficulties in communication partially to her non-native English speaker status and partially to undefined roles in group work. Speaking English as a second language, Laura did not have confidence to interact properly with the client. Also, without a group leader at the beginning, to figure out who should do what became another challenge, thus taking a lot of time for the members to get the project started. Even after that, management of the group work and decision-making remained a chaotic process for Laura, which inevitably made the project process difficult.

After moving to his home country, Irvin experienced one additional communication inhibiting factor — slow Internet connection, preventing him from using audio to communicate with his peers. Therefore, he had to largely rely on email to exchange ideas, which undoubtedly was very time-consuming and thus added to the difficulty of online communication.

So during the course I didn’t have much opportunity to use audio, and we were using emails. There are so many things to read and so many things to write. Sometimes you had

an idea in your mind to share with others, and if I share this I have to write pages to explain myself clearly rather than just using words. You know, so using the internet to organize everything was a really great challenge.

The fact that the group project involved four students made it even more challenging to get input from every member. To Irvin, it took four times long to get a piece of writing done. As a result, Irvin felt very discouraged to do collaborative data analysis and writing online.

I think the amount of time we have spent on writing this evaluation thing could be divided by four if you were you were in a face to face environment. I mean four times more on writing this evaluation plan. I'm really scared of when we work on analyzing data. That part is really, really challenging for us.

Laura also felt a lot of anxiety about completing the project on time as it took too much time for the group to work together and there was "no time to make the instruments good." This made it even more important to clearly know the deadlines so that the group could budget their time accordingly.

*Language and culture challenge.* In addition to the challenges discussed above, the group with two international students did experience some extra difficulty in effective communication due to language and cultural factors. Laura was particularly sensitive about her language skills and possible cultural differences, worrying those could prevent her from communicating well with her client. Irvin, however, never seemed to worry about these until he and Amy had a conflict because multiple people were working on the same sections due to ineffective communication and work coordination. In reflection, Amy viewed the problem as stemming from cultural differences in using and interpreting language:

I think I was dealing with my native tongue and at least two of them were dealing with it English as a second language. So I think that added to misunderstandings. I know Australian English and they know...so there is some cultural words that are different. And I think that sort of caused a few misunderstandings so that we had to keep reworking how we would say it more clearly. But on a technical level, I don't think they had an issue because they seemed to be able to produce technical wording very well.

Because I didn't understand why we were both doing the same things...but then we worked out that there was a language difference, a cultural difference and when we worked that out, then that didn't happen again. So it just it was a bit of hit-and-miss at the beginning because we didn't understand how each other interpreted language that we were trying to use.

Irvin also agreed that the differences were more about language use as he realized that people in other countries were sensitive about some "strong words." This instance taught him a lesson on how to avoid misunderstanding or being rude to others in online courses.

Laura who knew the ins and outs of the incidence and made substantial contributions to resolve the problem, however, saw cultural differences as the deeper underlying reason. Coming from a culture where people are less straightforward in expressing their opinions, Laura was more used to getting hints from others and doing her part courteously. She was very sensitive to different cultures and seemed to show more understanding to Irvin's communication style.

In many things I felt I wouldn't get angry as Amy got angry with Irvin because I felt his cultural. I always like to take in account people culture...I would understand Irvin and I never judge too much because it's part of culture. And he's a really good guy.

Not matter how people perceived the differences, working with members with diverse culture background was indeed challenging. Text-based online communication that deprived members of other types of cues for message delivery made misunderstandings easier to happen. As Laura cautioned, "people so easily get insulted online. Be really, really careful."

*Learning about the content.* Although the course entailed a lot for the students to learn in both theory and practice, only Laura and Amy reported challenges about learning the content. To Laura, lack of prior knowledge at the beginning made her feel challenged by the project. The challenge did not come only from lack of understanding of the subject matter, but also from unfamiliarity with authentic learning tasks and group work. Laura was eager to learn about evaluation, but at the same time felt anxious about how working in a group environment with a

client could affect her own learning. To Amy, the obstacle she experienced during the learning process was when she did not understand a question and neither her group member nor people around her could help, she would have to find a solution by researching. Nevertheless, this type of obstacle did not sound insurmountable for Amy. Instead, she gained more knowledge and skills during the problem-solving process.

*Research Question 3: How do students use self-regulated processes and strategies in the course?*

In face of the aforementioned challenges at both personal and group levels, the students did their utmost to study the course content and complete course tasks by use of various self-regulatory strategies and processes. Some of the SRL strategies and processes were used to directly address specific challenges; others were helpful for facilitating the students' overall learning process under existing learning environment conditions. In general, the specific SRL strategies and processes used in the course are summarized into four categories: staying on task, managing learning process, maximizing learning resources, and reflection (see Table 4.11).

Table 4.11

*Staying on task*

The students strived to focus on their learning tasks by environmental structuring, time management, and self-monitoring. As discussed previously, Amy, Irvin, and Judy got seriously distracted by major personal events during the semester and thus lost considerable time that should have been devoted to the course work. Moreover, Amy's and Irvin's role as parents of younger children made it even more difficult to ensure adequate study time. Being a mother of two young children, Laura never complained about limited time for study but obviously made extra effort in this regard by working on an aggressive schedule. To ensure quality time on the

learning tasks, these students actively structured their learning environments while setting aside as much study time as possible.

*Environmental structuring.* Irvin and Laura made efforts in structuring their physical study environment to escape distractions. When Irvin was still in Australia at the beginning of semester, he went to study at some public places on campus such as the library to resist the temptation of watching TV. After moving back to his home country, he had no choice but to create a small study area for himself in the bedroom:

I changed the face of the table to the way that I feel comfortable to study. I put a bullet board on the wall to highlight the important things and the reminders for myself and to be able to stick some papers on the walls so that I can see things. Because when I see things, I remember them, you know.

Laura, instead, sometimes studied at “a more hidden” place in the video room and sometimes at the library. But for most of the time, she worked on the course at her assistantship office after 5 PM when everyone was gone. The media room was another place she would go to use some research software. In contrast to Irvin and Laura, Amy’s children were older, so Amy did psychological space structuring rather than physical work environment arrangement. With a mini office at home, what she asked for was family support in “running the house” and undisturbed periods of time, for example, “two hours.”

*Flexible scheduling.* Since the learning tasks themselves and the group work took a lot of time, the course required the students to gain stronger time management skills. All the students reported that they had to be very flexible in terms of time, especially after the group project started in the second half of semester. Most of the students had a regular work schedule in the first half of the semester when they only needed to work on course readings and discussions. As the group project unfolded, they moved to an on-call stage as they had to be really accommodating to collaborate with group members and attend to group project related emails,

issues, and requests in a timely manner. May was one of the two students who kept a consistently high level of participation by checking the course every day and completing “the smaller tasks” as soon as possible. Regardless, when the “crunch time” came, she still needed to invest additional hours (e.g., in data analysis and reporting) to manage the work load. Before the project, Judy had a fixed schedule for doing readings on weekend and posting discussion responses on Sunday evenings, which no longer worked later. When her returning to the course in the last few weeks after taking a long leave, Amy worked on an irregular schedule in order to make up for what she had missed in both learning the content and the group project:

When it is a course I don't understand a lot of, like the one I am doing now, I would spend many hours each day — probably between 4am and 6am in the morning and then if I'm able, sometime in the day. But it's usually not possible. And then I would spend in the evenings from say 7 to 9 or 10...maybe later if I'm really getting into it. I would do that 5 days a week maybe. In the last three weeks, I've been getting up at 3 AM and going to bed at 7 PM.

The other students have been working quite significantly. So I just feel like I've got to help carry the load.

However, Amy's schedule was much “easier” early in the semester when she only worked in the evenings and one of the days on the weekend. A big reason for Amy to spend lots of extra hours was her feeling of having to “pick up my bit of the load.”

Besides the impact of group work on scheduling and time management, another reason for being flexible lay in the fact that the only way to fit their study into their already busy work and life was to do the course work whenever they could. With a big family and a full-time high school teaching job, Amy printed out all her course-related materials and studied wherever she went and at every possible moment:

I study when I am waiting for my children at net ball. I study when I'm waiting for them at dancing. I study when I a free moment at work. Early hours of the morning, late hours at night...Just because the way my lifestyle is. I have to organize my lessons for school

and organize my children and all their homework and whatever activities they are doing... driving to pick them up.

Like Amy, Laura made painstaking efforts to spare time for study, including waking up during the night to do course work. Except for the short period of time in Australia, Irvin did not have a set schedule and had to work whenever he could. Even though May had the least distractions, she also could not work on the course using big chunks of time; instead, she had to find “an hour here, two hours there.”

*Prioritizing.* Considering the challenges she faced in this evaluation course, Laura prioritized studying and working on the course as the most important thing that semester. She checked course website and discussions on a daily basis, paid special attention to email messages from the client and her group members, and responded to peer’s questions or requests as soon as she could. When intensive work was needed, she put off working on assignments for her other courses and took some time off from her assistantship work in order to work on this course project continuously. Obviously, Laura allocated the most time resources on the most difficult course to better meet the requirements. The same seemed true to Irvin as he commented in the Peer and Self Evaluation survey: “I cannot exactly say how much time I spent on doing these, but I can say that I have spent twice time that spent on any other course with the same credit.”

#### *Managing learning process*

Strategic planning, note-taking and material organization, as well as monitoring, assisted students in managing their learning processes. All the students reported some strategies or processes they used to make their learning easier or more efficient. How they generated and applied the specific strategies was related to their learning habits, personal goals, and available resources.

*Strategic planning.* In terms of planning how to go about completing the course tasks, some students reported they used the course syllabus, task descriptions, work examples, and deadlines as important tools. At the beginning of semester as she did for all courses, May looked at the syllabus outline and due dates to plan for the whole term. Irvin used the example evaluation plan provided by the instructor as a checklist against which he compared his own team's work. This way he ensured there were not any sections missing in his group deliverables. As the instructor had worried, the templates might have kept the teams from trying new approaches as Irvin was more concerned about completing the tasks on time instead of spending extra time on making changes when time was limited. In preparing to contribute to the online discussion, both Amy and Judy used a "thinking ahead" strategy by having the discussion topic in mind and then reading with the intention of "looking for something to respond to." This approach enabled them to read purposefully and better apply readings to discussions.

Combining study and work was another strategy that the three students with full-time jobs utilized to make good use of their time as well as to apply what they learned. May always had it in mind that she was going to apply her course learning in her workplace and thus was often actively looking for projects for application at work. Therefore, even though working full time, May did not feel that her work got in the way of her study or vice versa. Instead, since her work and study were very relevant, they complemented each other so well that May could practice the course learning almost right away. Working as a director of E-Learning at her university, Judy also had the privilege to use some of her professional development time to do course activities. Amy provided the best example of killing-two-birds-with-one-stone when she not only incorporated some her learning about evaluation right away but also emulated and adapted the instructor's way of doing online courses almost simultaneously in her own

computing classroom:

So I used that at school. And the actual thing that we were used in getting online was an online learning system. So I showed that to the language teachers at my school so they became more aware of the online facilities of the internet. And then, then evaluation part of it, I incorporated it into a computing class that I teach because the students are being taught how to install computer systems into business and an online version was... I just incorporated that. The fact that they had to look at how to evaluate the content of what they were going to be working on as a project. So there were so many facets that I incorporated in other ways.

Because Amy's study in evaluation and her teaching project at school happened concurrently,

Amy tried to adjust her teaching plans accordingly as her learning knowledge grew:

I was interested in how the course was presented to see if I could use those techniques. Then I was interested in the content of how you make an evaluation plan, and then I was interested in how you work on an international basis...and with students that you don't necessarily see and with a client you don't necessarily see. So things unexpected things happened and I learned new things so I had to keep changing my approach and changing what I was hoping to get out of the course.

At any rate, the real-time application of course learning to practice substantially reinforced

Amy's learning and exemplified how knowledge and skills transfer would look like in this case.

May shared one additional strategy when leading her team project — breaking down a big task to smaller parts. This allowed her and her teammates to gradually build up the final product and kept the workload from being overwhelming. Thus except the most work-intensive days, May did not have to sit for extended periods of time, which was helpful for her to concentrate and produce quality work.

*Note-taking and material organization.* Most of the students consider themselves to be organized with their study materials. All of them chose to print out the course readings so that they could easily carry them around and make notes. Laura, Irvin and May even printed out discussion postings and email correspondence about the evaluation projects for convenience of reference. Except for Laura who also saved the electronic course materials in folders on her

computer, the other students organized hard copies of these materials by content types or dates using physical folders, separators and binders. In addition, May thought the Moodle platform organized the course materials for students in a lot of ways. It was never a problem for these students to find any information that was already provided in the course.

All students except Irvin reported taking notes in the material printout margins or sticky notes. Amy got used to writing everything down as records for herself and reminders for things she needed to do. May marked the places in course readings where she would like to make comments for online discussions and also made notes on printouts of the instructor's lectures. Laura did similar things and highlighted the materials with different colors. Irvin also reported the marking scheme he developed:

I used different highlighters according to importance of the sections that I read. I try to connect things when I relate to my real life experience, my work experience and my experience on...in the past. When I write something or when I start to write something, I realize what is written in the chapters and then write and then compare my work to the chapter. Pink is the most important one. Yellow is something that I can use in my quotation. And blue is important. Sometimes I put five stars next to something if I really enjoyed reading.

*Monitoring.* The students monitored their study at two levels. The first level concerned ensuring steady progress on the course tasks. Course deadlines helped the students to pace their work and complete course tasks on time. Course materials such as syllabus, task descriptions, and examples that clearly listed project components were useful for the students to conceptualize and generate their own products. All these elements were used as important tools for monitoring progress. The students usually made sure that they read the text, participated in weekly online discussions, and contributed to the group projects.

In addition to the external resources for monitoring, most of the participants believed in the crucial role that discipline and perseverance played in monitoring their work and in achieving

their course and even long-term goals. Amy pointed out perseverance as her major source of motivation and power for action— “If I don’t persevere I don’t finish my degree.” Laura found that maintaining work on the evaluation project in spite of all the difficulties and uncertainties in her mind proved effective in improving her motivation, satisfaction, and feelings about herself, which was closely correlated to project progress. May and Judy both mentioned discipline when talking about studying online. May’s successful completion of the bulk part of the group project could be partially attributed to her habit of getting some work done every day. Judy thought in comparison with taking classroom courses, she needed more discipline to ensure study time on an online course each week.

The second level of monitoring dealt with gauging cognitive gains. May and Judy reported their strategy to check their own understanding against that of their peers through online discussions. May followed other people’s postings and tried to see whether she was “thinking along the same lines as others.” Judy, after reading every else’s postings, asked herself questions like “Did the comments make sense? Did someone say something that is very contrary to what I how I interpreted the material?” Judy also had opportunities for cognitive affirmation through group discussions. For example, Judy had a different point of view when her group bounced ideas around about stakeholders in the evaluation plan. Later the team reached a consensus after discussion via email.

Irvin, Laura and Amy also gauged their learning by practical application of what they learned from the “book” to the evaluation project. Amy reported that her best strategy for supporting her learning was to read a lot and apply what she read in her classroom. To Irvin, the evaluation plan and report were “something solid” that actually showed his learning. Irvin did not think of any approach for monitoring his learning for the first half of the course when the

tasks were only readings and online discussions. What he learned during that period was tested in the second half of semester when the concepts, ideas, techniques, methods, and tools were applied in the actual evaluation projects. Irvin pointed out that he did not realize his misconceptions or misunderstanding of some content until the time of real application. Similarly, Laura did check her knowledge by constantly connecting readings to her team project:

When I was reading the chapter on evaluation report, I tried to make connections and as much as what this chapter said in our situation. It pushed me to think about our case, not case of the share example or the case in the chapter.”

In monitoring her own learning, Laura went through the evaluation skills/competency checklist provided by the instructor early in the semester to see which ones have been applied in her project. Laura also tried to read some text again after the project started, which deepened her understanding and sometimes even shed new light on the project:

When you are getting back to this chapter, you see in different eyes. You even see your mistakes in the questions in the evaluation and decisions in the end.

Thus, revisiting course materials worked for Laura as a way to gauge the depth of her learning and push it to a new level.

### *Maximizing learning resources*

Due to the eclectic and complex nature of evaluation, novice evaluators find that it requires more than book learning to successfully complete real-life evaluation projects. In this course, some students proactively sought additional resources in an effort to familiarize themselves with specific projects as well as to better acquire key evaluation concepts, approaches, techniques and tools. The specific strategies used for maximizing learning resources included researching and help-seeking.

*Researching.* Four out of the five research participants reported looking for extra resources through online research. They used two types of research tools— general Internet

search engines such as Google and Google Scholar and online library databases. Both the academic and practical articles as well as tools yielded from these searches helped the students to 1) better understand the course tasks and content, 2) familiarize themselves with the subjects of the evaluation project, and 3) find and use appropriate methods and tools for evaluation and data processing. For example, Amy shared some the strategies she used when performing research to clarify tasks and to get different opinions on a topic:

If I am given a project or an assignment and I don't understand it, then I do a lot of research to clarify the meaning. I will spend a long time using my university library or using Google scholar, and I explore the internet and say, five or six different sources and compare them. Then when I get an understanding of the assignment, then I can refer to sometimes the notes that the lecturer has given. I always like to read more than that just to get another opinion.

Sometimes I don't understand something in a reading so then you get a different reading and it gives you a different perspective.

Laura tried her best to expand her knowledge on evaluation as well as on the various topics presented by the instructor. For example, in order to make sure she acquired as much knowledge on motivation models as possible, she sought for several types of resources, including “articles, tutorials, and software about motivational theory”.

Irvin was very convinced of data-driven findings and therefore felt more interested in getting the right tools for data collection and analysis. Laura supplemented her reading of additional articles with her search for questionnaire and interview tools specifically for her group project.

Both groups' projects involved topics that the students were not familiar with. One client needed to evaluate a math program offered at a university while the other project was to gauge the effectiveness of a piece of language learning software used for K-12 schools. Since none of the students were experts in these areas, the more active ones found it important to equip

themselves with some background information about the subjects and about the particular programs. Amy searched for some online language learning websites and compared those with what they were evaluating. Laura did a lot of journal article searches via Google Scholar and library databases to gain understanding on both the subject of language learning and instructional design related to language learning environments. She also spent extended periods of time familiarizing herself with not only the language instruction environment her group used for evaluation, but she also tried to compare it with some other language learning software. May not only found some readings about her group project for herself but also shared them with her client via email and with her group members by posting them on the course website.

*Help-seeking.* Student help-seeking was not prevalent in this course. Most of the students tended to interact more with their group members when there were any questions or difficulties. It seemed natural for the students to send group or private emails to ask, answer questions, or simply share information. The students rarely called each other to discuss something because of the big time lapses between their time zones.

Most of the students felt reluctant to ask the instructor for help. They either clearly expressed their hesitation or had difficulty recalling the instances when they asked for help. It seldom occurred to Amy who was never afraid to ask people for help to directly ask the instructor for anything. She explained the reason as she had been conditioned by the culture of her online Bachelor and Masters degree programs to “not ask me, ask your peers.” Actively wrestling with the course content and tasks, Laura had many thoughts and questions in her mind but was often too afraid to ask because she held professors in very high regard and thought the instructor would expect students to find answers on their own.

I was always used to...no, do not bother too much professors. And we have syllabus and we have ... when you are learning online, I like to read what professor wants for us and

be very deep in this question or deep in this assignment. And, you know, get inside and then I would also be very close to what he would like from us. Therefore, Laura usually relied on herself to figure things out and resolve problems until a specific instance when the instructor addressed her issue promptly. Laura then realized that she had wasted too much time by not seeking help from the instructor, which she thought a good lesson for her from this learning experience:

Sometimes I think it was better to ask and seek for help and we waste some time not doing that. But at the beginning, I didn't know how to get in contact with client and I didn't have a sense that we need to keep the wiki and invite our client to visit wiki, that we would post questions and he would answer in the wiki...everybody would see. And I lost about three or four days thinking and analyzing. Then I asked my group what to do and nobody answered, maybe because my question sounded ridiculous. Then I emailed [instructor name] and said, "You know, my group is not answering. What do you think?" And then he just put everything together...how we need to do. I thought: "Wow! Why didn't I email him at the beginning?" I lost four days, which is a lot. And I mean we could ask more things. We just maybe used to being independent and not asking things. And now I don't think it is good.

I think we need be more flexible in turning for help when we feel stuck or confused; so the process would be more efficient and effective. It is my second lesson.

Irvin, after thinking hard, said there might be a few times when he asked the instructor questions for clarification. May also vaguely recalled asking the instructor clarification questions about readings on the online discussion board.

Amy was the only student who benefited significantly from help seeking. First of all, she asked many questions of group members and received good suggestions about how to work on specific tasks, which greatly facilitated her learning. Secondly, working in a computing department, Amy was able to get answers for many questions at work as easily as she did from her group members. Thirdly, because of her high school work setting, Amy also had access to people with language learning expertise, which was relevant to the subject of her group evaluation project. Moreover, these were also good opportunities for her to disseminate her learning from the course.

At school I would be talking with my computer colleagues about what they thought about the technical side of the course I was on. And I went to speak to the language teachers about the project because we were evaluating a language learning environment. I would talk to them about it...and what do they consider. I spoke to one Chinese person, one French person, and one person who wasn't a Spanish teacher but used Spanish. And I talked to them about what their opinion was so that I would get it from a technical and a language perspective.

In addition, Amy even received help with data collection when the language teachers at her school got student data for her, which was not provided by the client of her group. Another mathematical colleague assisted her with data analysis and presentation. In all, Amy received a tremendous amount of help from the people around her for virtually all aspects of her course project.

Working in an educational environment proved a great benefit for May as well. May looked for things she needed for the course at her monthly professional development meetings with a group of computer teachers. She also found two mathematical educators at her university to conduct expert reviews for her group project on evaluating math instruction. Although Irvin sometimes talked to people around him, such as his wife and friends, about what he was working on, he did this more out of a need for social interactions and general information sharing, since they didn't have much knowledge in technology and thus were more passive listeners.

### *Reflection*

Reflection is the process when students think about and assess their performances during a learning period. It is also interwoven with the process of monitoring where students actively adjust motivational states and learning strategies based on the results of reflection to ensure learning progress and optimal learning outcomes. The students' overall reflection processes during this evaluation course are explained through their self-reflection and self-evaluation activities.

*Self-reflection.* The students' self-reflection on their course activities varied in both frequency and things that they thought about. The frequency of the students' reflecting on their learning ranged from once in a while to all the time; their thoughts were mainly about group work, learning, and performance. According to the interview data, May and Judy seemed less reflective about their course activities while Amy, Irvin, and Laura thought about their work much more often.

May reported that she didn't have many worrisome thoughts. Once in a while she wondered whether she was on track and whether her progress was acceptable. Judy did not think about her performance much either because she felt a little rushed. Interestingly, her reflection happened at points of frustration, for example, when she was going to be away but the unavailability of a book chapter prevented her from keeping up with the course. At those moments, Judy asked herself questions like "Should I pursue this? Should I keep participating? Or should I bow out of the course?" "Am I putting into this course enough and am I getting out of the course enough?" Judy's positive answers to these questions restored her motivation and efforts, which supported her continuous engagement with the course until the end of semester.

Amy, Irvin, and Laura, however, frequently thought about their own performances or that of their group. Amy reflected on her work constantly except the times when she had to leave for personal reasons. Working in a group had a strong impact on her reflection. Because of the multiple leaves of extended periods of time, she often thought about whether she would be able to rejoin the team without feeling as if she was starting over again and whether or not she would contribute "an equivalent amount of work to the others". She also considered what additions she could make to the team and what she could learn from the group as well as the group experience. Even before the group project started, Amy began to think about how the members would blend

and work together. With a focus on learning and application, Amy also always asked herself how she would learn the things she had little prior knowledge about and apply what she learned, including that about group work, in her own classroom.

Conversely, Irvin's self-reflection was more centered on how well he and his group performed on course tasks. Thinking that his group performance was a reflection of his own performance as a team leader, Irvin tried, on one hand, to successfully complete his own work and on the other hand, to keep high-level group performance by asking himself group management questions, such as "Am I getting people to do the right thing?" "Will the people complete the things on time?", and monitoring questions, such as "Are we on the right track?" "I am doing something wrong? Or is there anything perhaps we need to add, change, or delete?"

Laura reflected on things about the course as well as her own activities all the time. However, she felt unsure whether or not that was the result of her lack of confidence on many things. For example, when Laura interacted with the client, she felt a little scared and wondered whether the meaning she expressed in the messages was not as "sophisticated" as that of other "English speaking people." She also asked questions such as "If it didn't work, why?" and "How to make it better?" Her feeling of the group project being "not great" made her to reflect often. In general, Laura's thoughts were more about doing their evaluation project with quality.

*Self-evaluation.* In the peer and self-evaluation survey, the students evaluated themselves objectively for their contribution to the group project: Irvin, Laura and May rated themselves 4 out of 5 for their efforts, while Amy and Judy gave a self-rating of 3 out of 5. All the students reported being able to do each of the evaluation activities as listed in the survey. Irvin and May answered positively with confidence when responding to the question about whether they had reached their goals for this course. Laura used 70-80% for this question to indicate her

reservation. Judy pointed out the negative effect of her personal situation on her course participation, although she enjoyed the course and the project.

In the final interviews, Judy assessed herself by the contributions she made to her group project, which she thought had added value the entire project. Amy, May, and Irvin used application and transfer of their learning as a self-evaluation criterion. It was important for them to know whether they could really do projects on their own by applying the knowledge and skills they gained from the course. Amy believed that whether she was able to produce a similar learning environment at her school would tell how well she had learned. The fact that she could work with people that she never met in person proved the amount of learning about group work she had gained along the way. May explained a similar line of thinking, and she gave herself a positive assessment result according to her own criterion:

I guess what I have done is I thought “Well, can I take this and apply it again to my own work?” “Can I transfer these skills and this knowledge to what I want to do every day?” And I think in this case it has been successful that I have. I have been able to I have been able to find a use for this and I can repeat the practice in my everyday work situation.

In addition, May felt that the client’s and stakeholders’ feedback of her group evaluation project and the final report would be another indicator of the project quality. Irvin’s self-evaluation somewhat overlapped with his self-monitoring process as he made judgments about his learning of the book knowledge by checking whether he and his group could successfully complete the evaluation project. He also reported that the instructor’s formative assessment of the group’s evaluation project deliverables had helped him to tell whether his group was on the right track and to figure out how to make remediation if there was anything wrong.

Laura was similar to Irvin in that she also used feedback from others to assess her progress. She mainly looked at what the instructor and her teammates had to say about her work. Laura’s self-evaluation, or the occasions when she evaluated herself, tended to occur

retrospectively instead of in the middle of doing actual work because she could not see flaws until she “gained more knowledge at the end of project.” Laura’s self-evaluation also included some reflective thoughts on her own personal attributes.

In the process of all projects, I would look back and I would see flaws. And I would see some things, evaluate, and think that if I would was more focused, if I spent more time, if I would be less scared about falling...I would reflect on my character features.

Last, Laura summarized these aspects for continuous improvement in her response to one of the Peer and Self Evaluation survey questions.

1) Better organize work - not to try to do everything by myself - divide and give feedback on each other parts, so product would be more constant and aligned 2) keep deadlines, 3) not to be afraid to debate with group members about issues that are important to our group work: discuss in Moodle, more interact with client, go for more challenge, give analytic feedback, etc.

*Research Question 4: What support can be built in this learning environment to promote students’ self-regulated learning?*

A careful review of the environmental influences on the students’ learning experiences and the students’ self-regulation processes led to the following future supports that would possibly promote students’ self-regulated learning in the course as summarized in Table 4.12: 1) enhancing course structure and guidance, 2) enriching course materials and resources, 3) improving communication at all levels, 3) using technology to facilitate learning, 5) creating a strong online presence, 6) supporting students to overcome distractions and circumstances, 7) providing ample opportunities for individual students to assess learning processes and gains.

Table 4.12

*Enhancing course structure and guidance.* The students clearly desired more structure and guidance while they were struggling with the real-life learning tasks. The most identified issues included inadequate clarity about the timeline for the major assignments, a lack of

specifics of assessment, and insufficient guidance for how to perform effective group work and conduct an evaluation. Students' responses in the final interviews substantiated this observation:

My preference would be to have more guidance. (Amy's response in the final interview)

I think if you have more clarity... I think it in general maybe uh I think I still miss deadlines or structure. (Laura's response in the final interview)

Maybe I just didn't have enough background I think. And I was in the beginning quite scared and chaotic. (Laura's response in the final interview)

Maybe less time — not enough to give each other feedbacks. (Laura's response in the final interview)

I guess some clarification on when we actually do finish in that and I'm assuming it would be the same for everybody because we are not [the client's university] students or perhaps we're not sorry [the instructor's university] students. I am expecting our session to finish mid-June. So I guess there's that sort of speaking of schedules...you know two different universities with schedules that don't align, I think there is even more need for clarification. (May's response in the first interview)

I wish I had made an earlier start. I was waiting for a prompt from [instructor name] or one of his tutors. (May's response in the Evaluation Planning Process Assessment survey)

I think if there had been a...more...Do you know what a rubric is? Well, if we'd had a slightly more clear one of that perhaps it wouldn't have taken us as long. But I don't know because then we had everybody had things going on in their own lives. So I don't know if that would have mattered. (Amy's response in the final interview)

Thus, to support students through the already challenging tasks in their initial exploration of evaluation, it is better to provide more structure and specific guidance in several aspects. First, concrete instructions on how to produce effective group work need to be in place, explaining the importance of selecting a group leader, conducting regular team meetings, etc. Second, it is necessary to explicitly communicate instructor's expectations for students about their roles, responsibilities, and time commitment before the course starts. Third, the course should help the students to develop a clear big picture and plan for milestones. Even though the time frame of a real-life evaluation can be affected by many factors, having clear initial goals and a workable

action plan would help project completion. Fourth, standards for class participation and rubrics for course deliverables should be included to better guide students.

*Enriching course materials and resources.* The students' perceptions of the course workload and their evaluation project experiences showed there was a need for more course study materials and resources to both expand their knowledge base and assist project completion. Specifically, Laura wanted a larger amount of readings or supplemental materials at least for the first half of the semester when the big projects hadn't started yet; otherwise, the students including Laura, would feel a lack of a sense of urgency.

Because the book is not big, and two chapters are not so much, everybody knows. I think my feeling it is not enough readings and everybody little bit relaxed even me relaxed. And I felt that I waste half of semester. I could have done that much better if I more pushed...not pushed but have challenge at the beginning. The reading is not so much.

Laura and Amy also shared their expectations for more resources for practical project needs, such as information and tools about data collection and analysis. In fact, some students were working on their Master's degree, which might not require much researching and data processing skills. Even the doctoral students were exploring evaluation and many associated areas for the first time in this course. Consequently, the students spent much time researching related resources or seeking help:

I think it would be faster and maybe it ....we need to look for resources and demonstration and then maybe to start evaluation project. If we were given research tools more useful. (Laura's response in the final interview)

I really didn't have background and ....it is not good for me. Maybe I didn't have background in learning before this course. Maybe it would be good to have, you know, knowledge in the research, and I know instruments what would help. (Laura's response in the final interview)

Perhaps we could have had a bit more information on how to analyze the data. And before we actually had to do the analysis, perhaps we could have had more information. I'm a Master's student and I hadn't done it before. So I didn't know what to do. So then one of the other students said he'd ask somebody at university and then I asked some

other people at university so that sort of stalled the task a lot. Because we had to go and find resources, which takes a while. (Amy's response in the final interview)

Because of her personal situations, Judy had requested some course readings before she began to travel and lost easy access to the course. However, as the main course text was being rewritten while the course was in progress, the chapters were not available until right before the week modules began. So Judy did not get strong support in that respect and wished the materials were made available prior to the start of the course.

May enjoyed some of the course materials and particularly the narrated PowerPoint lectures. She indicated that, for her, it would be ideal for her to see that type of material each week.

I guess how I would answer that is I would think of I'm thinking that is what I would consider the best learning experience I've had so far in this course. What struck me and perhaps more of those things? I really enjoyed Tom's lecture on the Eight Dimensions of Effective Online Learning. I thought that that content just really struck home for me because that is something I can turn around and sort of build a worksheet for it in academics here that I work with. That is something that I would like to do. And I really very much enjoyed those little weekly PowerPoint. You know just the voice and that sort of thing is very nice. So I guess I'd to see more of that. I don't know exactly where that belongs in the course but we started out with a, that was a weekly sort of boom there's a PowerPoint book there's a PowerPoint and that was weekly and that hasn't happened for a while and I sort of miss that.

Therefore, for the following iteration efforts should be made to provide enriched study materials and resources, including a greater amount of readings, supplemental materials, and resources on some specific topics, as well as to make all study materials ready at the beginning of the semester.

*Improving communication at all levels.* As discussed earlier, communication presented the biggest challenge for group work, which in turn influenced the students' individual learning. Communication issues existed at several levels. First, there was a lack of communication about absences and non-participation within groups. One student left the course for her honeymoon for

a whole month without notifying the rest of her group; another student had Internet access issues the whole semester and nobody knew when he would be participating and when he wouldn't be able to; Amy left and returned several times, but her team members didn't always know what was going on. Irvin complained in the final Peer and Self Evaluation:

Within the last two weeks of completion of the evaluation report, she didn't communicate with us...without informing us that she would be away for a while. Since she was the only native speaker in the team I was expecting more from her in editing our work.

Ironically, in some instances, Irvin himself failed to inform his collaborators when he had a personal situation and left everything to Laura to handle:

I had some problems as well I had some breakdowns in the communication with the team. (Irvin's response in first interview)

Several hard times (when there was lots of work to do) he [Irvin] would disappear. (Laura's comment about Irvin in Peer and Self Evaluation)

In contrast, Judy shared her circumstance with her group, for which May showed appreciation in her peer evaluation of Judy:

Although Judy could not participate fully, she did make her situation clear to me and the others in the team, which I do appreciate.

At the second level, communication about work division was ineffective in one group possibly due to language and cultural differences, resulting in a conflict between the group members. The third level of communication problem was between a student group and their client at the times when the client did not respond to the student evaluators' requests within a reasonable time frame. Even though the instructor intervened and facilitated the process eventually, the overall project was much delayed. The fourth issue concerned communication of instructor expectations as discussed above.

Therefore, improvements of communication in the course should be targeted at all these levels. The instructor could first clarify what was expected from students for active participation

at both the individual and team level. He could also model use of recommended communication tools and manners for the whole class, for example, taking advantage of tools within Moodle to announce course updates and sharing his own travel plans at the beginning of the semester. In addition, more effort should be made to facilitate the communication within groups and between the groups and their clients by more frequent project status checking and earlier intervention at times of need.

*Using technology to facilitate learning.* The students seemed to have experienced more challenges than assistance from web-based technology this semester, which was caused by different types of reasons. The first type of issues concerned uncontrollable factors, such as problematic Internet access and malfunctioned Moodle wiki. The former caused considerable time loss and frustration for Irvin; the latter led to loss of May's group wiki content and thus hampered the members' momentum at a critical time of the evaluation project.

The second type of technology issues stemmed from usability and affordances of collaboration tools. Even when the group wikis worked properly, Laura found it designed unsophisticatedly, inflexible to use, and unappealing and inconvenient for collaboration. She illustrated her point with a specific example:

You cannot change forms. If you want to align, it's not aligning. It was not very responsive for editing sometimes. You cannot put a picture, and you cannot attach documents. It was clumsy.

The unsatisfactory wiki appearance partially contributed to the fact that not all the experts who participated in the expert review for Laura's group evaluation project were invited to see their work posted on the wiki.

The third type of technology-related issues dealt with underuse of Moodle-supported collaborative tools due to lack of information or knowledge. At the end of semester, Irvin

suggested that providing group discussion boards for group collaboration would make the process easier because he often got confused when a large number of project-related messages were sent to his personal email address. He also hoped for a way to know who edited what on the documents that the whole group worked on together. This revelation really surprised the course designers and researchers and made them realize that they had made assumptions about the students' awareness and knowledge of the group collaboration tools, such as the group discussion forums. Even though it seemed that Irvin was the only one who was unaware of the existence of the group discussion area, Laura confirmed the group's nonuse of it. Since May's group mostly relied on May's contribution for the overall project, undoubtedly there had been little use of the group discussion forum.

When preparing for the second course iteration, these issues ought to be dealt with in the following ways. First and foremost, an orientation to the technology used in the course should be mandatory for all class members regardless of their previous experience with the Moodle platform. Although some students might have some level of experience, it is still necessary for them to understand what tools had been incorporated and should be utilized for their groups. For those new to the Moodle course management system, detailed instructions for how to use each of the provided tools are definitely necessary. Second, in order to make their course management easier, the students should be encouraged to use tools embedded in Moodle as much as possible. One thing that the researchers strongly recommend is to use course mail for course communication purposes so that students don't have to log into multiple places every day. In the meanwhile, they should feel free to explore other possibilities for group communication, such as using Skype and conference calls for synchronous conversations. Third, wiki functionality should be improved from the administrator's end as much as possible. When glitches happen for

uncontrollable reasons, the course administrators should minimize the impact and duration of such disruptions.

*Creating a strong online presence of both instructor and learners.* Although the students did not complain about lack of interactions in general, some did clearly express a desire for seeing activities from peers outside their groups. For example, May and Laura both wanted to see the other team's progress:

Please post to the forum. The last forum posting I see is from April 9. It's a good idea to have the two working teams, but I have very little idea about the other team and would like to hear how they are progressing. I am relying more and more on email communications. (May's response in Evaluation Planning Process Assessment survey)

I really like support that you know [instructor name] would share what blue team did. It is real important because it always motivate us much more. And I think it very good decision. (Laura's response in second interview)

The asynchronous nature of the course determined that the students would not be able to interact in real-time with the class as a whole. The large time zone differences made it difficult for even members in the same group to communicate synchronously. The only two aspects that could help create a feel of "classroom" were the online weekly discussion forums and the group wikis. Unfortunately, students' activities in both places were very limited because of all kinds of reasons including technology. The online discussions never took off, and the group wikis were infrequently updated. The vast majority of student-student interactions as well as student-instructor interactions took place through email exchange. Except for the instructor, the students seldom interacted with people outside their teams, which made it feel more like a group experience than a course experience. However, the interest in knowing their peers' progress and status as revealed in May and Laura's remarks indicated the students' need for information sharing and mutual encouragement. More visible peer activities would also help students get to know each other better, thus increasing their sense of belonging while heightening a sense of

“urgency,” which would in turn enhance their motivation. On the other hand, the instructor’s email interactions with individual students or groups were helpful for them to progress as a small group but unfortunately remained invisible for the rest of the class. A stronger presence of the instructor in front of the whole class should be created to make the class communication more effective and to also help the student feel like they are part of a learning community. One possible approach could include periodic class announcements and discussion postings at appropriate times.

*Supporting students to overcome various distractions and circumstances.* It was very unusual that most of the students as well as the clients and the instructor had major personal emergencies and exigent circumstances during the semester. At a personal level, Irvin, Judy, and Amy had situations that prevented them from continuously participating in the course activities, which hampered both their motivation and learning. At a group level, the interruptions in their participation together with those of several non-research-participating students made the group work even more challenging for their group members. The personal issues that happened to the clients more or less added to the students’ difficulties in obtaining the information they needed for the evaluation and consequently caused delays beyond the students’ control. All these problems unfortunately accumulated and eventually resulted in serious delays in evaluation project progress and large detriments on the students’ motivation. In the end, Judy and Amy both reported their personal situations as the factor that had impacted their course experience the most. Amy indicated her wish for assistance in getting connected with other students at the end of semester.

I think students when they are online and alone connected by visually they need to have more guidance as to how to solve the problems, but not be given the information to do that. Because that’s part of the learning. I think maybe that the lecturer could insure that there is a connection between the students before leaving the students to just work. And I

think particularly in this course when I had such a big gap of being away I found it very difficult to make connections. And perhaps it would have been easier if I'd had a little assistance but I'm not sure how that would happen.

Irvin also reported in the middle of semester that his motivation had been affected by too many things going on in his life. Other than daily personal and work responsibilities, Laura did not have too much happening in her life but had suffered from a lot of frustration, stress, and worries directly or indirectly caused by unsmooth group project work. May, with her consistent work on the course and stable psychological and emotional states, did not seem to experience excessive stress but apparently took on more than her fair share of work throughout the semester.

Realistically, nothing could have been done to prevent inevitable personal events from happening. However, there is a need to establish some practice to help student better cope with such situations for themselves as well as for their groups. For example, the students should be first warned about the time commitment they would need to guarantee before formal enrollment. They should also be reminded to plan for travels, major events (such as wedding), etc. in advance and inform the course instructor and their group members of anything that may happen during the semester in order to minimize the negative effects on group work. To help students overcome uncontrollable disruptions, it would be useful to make study materials available in advance and advise students to connect with the rest of the class, especially the instructor and their collaborators, during absences and after returning. In this regard, the course instructor and facilitator may need to take the initiative to reach out to students and help them overcome barriers for communication.

*Providing ample opportunities for individual students to assess learning processes and gains.* The extent to which the students monitored and assessed themselves in terms of cognitive processes and gains varied extensively in this course. The self-assessment activities were more or

less focused on the group work aspect of the course as the collaborative evaluation project was the central learning assignment. The component of individual learning was somewhat obscured by the group work. Although some of the students used peer and instructor feedback as well as the online discussions to check their understanding of certain topics or concepts, there were not many formal or informal opportunities for them to assess their learning processes and gains as individual learners. Since the evaluation assignment was a collective effort and each individual student only got to work on certain parts of the project, it was likely that some of them mastered knowledge and skills in given areas of evaluation but not in the others. The lack of opportunity to assess individuals might lead students to overlook these inadequacies. Therefore, students would probably be better supported in learning about evaluation if the course provided venues, such as quizzes and prompts for self-assessment in the middle of the semester, to aid students in assessing their individual learning process and cognitive gains.

#### *Design Principles and Strategies from the First Iteration*

Based on the findings from this iteration, seven design principles and the corresponding strategies to support self-regulated learning in online courses were derived as follows: (1) engage students with authentic learning tasks, (2) create a strong online presence, (3) enhance course structure and guidance, (4) enrich course materials and resources, (5) improve communication and interactions at all levels, (6) provide guidance for group work and facilitate group collaboration, and (7) provide ample opportunities for individual students to assess learning processes and gains. The specific design and implementation strategies are summarized in Table 4.13.

Table 4.13

## **The Process and Results of the Second Iteration (Fall 2008)**

### *Process of the Second Iteration*

A total of sixteen students enrolled in the “E-Learning Evaluation” course from August to December 2008. As one of the changes to this iteration, the open course recruitment was limited to students from institutions in North America in an effort to eliminate large time zone differences and the resultant complications. As in the first iteration, the instructor sent out email course invitations to several other institutions that had requested information about this course. The face-to face version of the course was originally offered every fall semester at the host institution, and the online offering for fall 2008 was listed in course schedules for host institution students through the course registration system. The open enrollment ended with eleven host institution students and five students from outside institutions, the former taking this course as a regular class and the latter doing it as independent study. Overall, there were thirteen females and three males from three U.S. institutions and one Canadian university, representing Canada, Korea, Taiwan, and the USA in terms of nationality. Six students had a mother tongue other than English. The group was composed of six Master’s students and ten doctoral students. All are registered students in a degree program at their institutions.

Based on the findings from the first iteration, several redesign and revisions were made for this iteration in the areas of course structure, communication, online discussions, course materials, assessment and technology. For example, the course presented an enhanced structure through guided group work, explicit instructor expectations, and a clearer time frame. In terms of the group work, a fellow researcher and course facilitator provided specific guidance by assisting the students to select a group leader and set ground rules. Materials regarding conducting virtual meetings and collaborative editing were added to the week 2 course content. Instead of having

one discussion forum for all groups, separate discussion forums for each group were set up to facilitate small group discussions about their projects. The fellow researcher also assisted the groups with arranging weekly team meetings and attended the initial meetings to help them get started. In addition, the instructor deliberately clarified his expectations for students in terms of time commitment, participation and contribution both in the syllabus and through course news announcements and weekly updates. Another important revision was that the instructor used more definite deadlines for the two main deliverables to help students pace their project.

In terms of communication, the instructor tried to model preferable communication modes by shifting from email to Moodle tools (e.g., course news announcements, weekly updates, and discussion forums for optional topics) for sharing information with the whole class. In order to explicate his availability, the instructor shared his travel plans for the semester in the course syllabus in the hopes that the students could follow his example to be proactive in informing group members of possible absences or leaves. Efforts were also made to increase the online presence and to help class members to get to know each other. In the first week, the instructor asked all class members, including the researchers and course facilitators, to upload their pictures and then introduced an ice-breaking activity by leading the class to share some interesting information about themselves. The course also made use of Moodle's ability to attach a picture to each student's name in discussion forums so as to increase visibility and foster a sense of community. In the meantime, the course instructor encouraged groups to not only update their own group wiki in time but also visit other groups' wikis for information sharing and progress monitoring.

Changes to online discussions included: First, an addition of optional discussion forums where people can freely post any topics of interest while keeping the required "Question of the

Week” discussions which were based on weekly readings. Second, the required discussions were a little more structured as there was a requirement for responses to at least three classmates.

The fourth aspect of improvement involved enriched course materials. The existing book chapters written by the instructor and narrated PowerPoint presentations remained the primary materials while supplementary readings, case studies, online tutorials, and a few additional PowerPoint presentations were assigned. The course also provided more evaluation resources, including the instructor’s webpage which presented a collection of evaluation tools and a number of items added to the course weekly content.

In the first iteration, the students were assessed on the basis of the group evaluation project, discussion participation, and peer assessment of contributions. A difference in this iteration was the addition of a component for assessing individual learning of evaluation, which consisted of three quizzes available at the course Moodle site. Moreover, the course provided specific rubrics for assessing the evaluation plan, evaluation report, and online discussion participation. In terms of data collection for course improvement as well as for the research, the Evaluation Planning Process Assessment was renamed as a Mid-term Evaluation and a final Course Evaluation was administered at the end of semester in addition to Peer and Self Evaluation.

Lastly, the design team strived to promote technology use for facilitating learning in three ways: first, the course facilitators created a Moodle Survival Guide as a how-to to help students use Moodle tools for organizing and managing their study. With the given technical information, the students were strongly encouraged to utilize the course website as a centralized place for their course related activities. For example, the course facilitators modeled use of Moodle course email and expected the students to maximize its use. It should be also noted that soon after the

semester started, we turned on the subscription feature in the online discussion forums so that students could receive email notifications every time a new posting was made. Second, the whole team worked more closely to ensure wiki functionality. Third, the course encouraged students to use their choice of collaboration tool for group meetings (such as Skype) and collaborative writing (such as Google Docs). Figure 4.3 shows a screen capture of the second iteration Moodle course website. A sample course syllabus and weekly activities can be found in Appendix B and Appendix E.

Figure 4.3

### *Participant Profiles*

Eleven out of a total of sixteen students chose to participate in this research study. The participant group was composed of three males and eight females. In terms of age, there were four between 26 and 35 years, five between 36 and 45, and two between 46 and 60 years old. One student was working part time on her doctorate at a Canadian institution while holding a full time job; the other students were full time students registered with American universities. Six out of the eleven students from American universities were from the institution offering the course; the other five represented other U.S. institutions. Except one Master's student, the other ten participants were enrolled in a doctoral program in Instructional Technology or related field. Three participants had a mother language other than English and were studying in the U.S. as international students at the time of this study. These participants had various levels of previous online course experiences, fairly high technological skills and high confidence in these skills. They reported that they were mostly motivated to take the course for reasons of learning and application. The participants identified flexibility and online discussions as favorable aspects of online courses; yet, they indicated communication and collaboration as the biggest challenges.

As gathered from the Student Profile Survey at the beginning of the course, the participants' demographic and online experience information using pseudonyms is summarized in Table 4.14 and Table 4.15 respectively. In terms of entry knowledge and skills in evaluation, most of the students were at the beginning to intermediate level, and only a few had intermediate to advanced skills in some specific evaluation areas. Table 4.16 presents a summary of the results of the Evaluation Skills Inventory administered before the course started.

Table 4.14

Table 4.15

Table 4.16

*Research Question 1. How is the motivational aspect of the students' self-regulated learning evident in this course?*

According to the students' self-reports in interviews and surveys, their motivational beliefs were mostly positive with some variations in goal orientation and self-efficacy. In terms of goals, a majority of the students took the course to satisfy their interests in the evaluation subject and aimed to apply their learning in the near future. A few students, however, reported course specific goals that were more of an extrinsic nature or a mixture of learning goals and extrinsic motivation. The majority of the students thought the tasks very relevant and helpful, and the others felt the usefulness of course activities, to a given extent, dependent upon some other factors. Overall, the students reported high levels of confidence in attaining the goals they set for the course. The motivational aspects of the students are summarized in Table 4.17.

Table 4.17

## *Goals*

Students reported both intrinsic and extrinsic goals for taking this course, although they were mostly driven by intellectual curiosity and wanted to satisfy their interest through engaging in the learning activities in the course. Interest in evaluation was the most important reason for student enrollment, but students varied in their extent of interest and focus. For example, the majority of the students were more interested in the practical aspect of evaluation, whereas Ally wanted to learn about evaluation theories. Most students took the course voluntarily, while Tyson took it mainly to fulfill program requirement. In addition, the instructor's fame in the field of evaluation was a secondary consideration for many students' participation but was the number one reason for Jane to enroll. Ultimately, the students in the course had mixed motivation, though a focus on learning and application was mostly reported.

Specifically, most of the students identified interest in evaluation as their strongest drive. They believe in the importance of evaluation in itself as well as its potential for creation and improvement of the educational environments they would make in the future. The instructor's expertise in evaluation added value for this course and encouraged the students to become more engaged. The students shared many similar comments in the first interview:

I want to learn a lot about evaluation, especially in the education field. I know that [instructor name] is one of the top evaluators or excels in evaluation, so I wanted to see how he was teaching it so that I could possibly teach it in the future. (Ally)

So I am interested in online evaluation, e-evaluation, e-learning evaluation whatever. That is one goal I would really you know I'm interested in the field I'm interested in how it's done and excited about learning about it from somebody who really has had a lot of experience. And probably my second goal is to just see how an online class is run. (Katie)

I am interested in the subject and also excited to learn from someone who is well-known in the field. I feel like this is an incredible opportunity for me to be able to take a course from an instructor who is so well known in the field and from another university which brings a whole new perspective to me that I wouldn't have the opportunity do. (Katie)

My motivation for taking this course was two-fold: one the topic and one the professor. You know because I have studied [instructor name]'s research for a number of years and I'm familiar with it. And I know that he is very progressive in the field. So I think it's very important to know what is going on and where we are heading. I like the topic evaluating online learning and I like the way that he's doing it, which is a theoretical practical approach. (Mia)

I was interested in the evaluation that the content of the course itself. (Carrie)

[The instructor] is so well established in the field. (Carrie)

Like the instructor cause he is kind of famous. (Jane)

I am familiar with like one of [instructor name's] books and research so when I heard he was opening up the course to other people, I was like "yea, I get to take it from a famous person." So I felt pretty excited about that. (Karol)

In terms of specific goals, some of the students knew how they would apply the knowledge and skills to specific settings of their interest or made clear connections to their own doctoral study focus. For example, Cindy wanted to understand the factors that might affect multicultural e-learning, including evaluation; Carrie thought the course would help her in exploring her interest in simulation-based learning by providing her with more understanding of evaluation tools such as interview, expert reviews, and authentic tasks; Karol was interested in applying what she learned to construct effective e-learning environments for professional development in public schools through formative and summative evaluation; Katie's general goal was to develop and teach good online courses. Some other students didn't have an immediate situation for application but instead wanted to prepare themselves through the course experience for future career possibilities, such as consultation. While Ally had a vague interest in using this experience as a resource when providing consultation for some organizations, Gary understood clearly how he wanted his valuation skills to complement his main career:

Hopefully I'll be able to work on more evaluation projects in the future but for money. So to help bring in a little extra money for my experience. I want to be a PhD and teach at a college but I also want to be able to have experience to do some things on the side of

that because I know PhDs don't get paid all that great. So I want to be able to have like some kind of a side experience and help, help me to know how to do an evaluation so that if I needed to I could go out and look for a client in the community.

The extrinsic motivation in the course was evident in Tyson and Jane. Tyson frankly said "it's required for my degree," although he did note "the content is interesting." His interest in the doctoral program being something other than evaluation explained why he had been lukewarm throughout the course period. His specific goal for the course was "collecting the resources" rather than "learning the details of the content" because there was "no way I am going to absorb it all." Therefore, although Tyson still did everything he should to fulfill the course requirements, he never appeared enthusiastic about the content and activities. Jane seemed to take the course mainly for the instructor's reputation, although she also wanted to "get a feel of evaluation." When she got busy with all her other coursework later in the semester, Jane could not catch up with the readings and to some extent gave up on putting forth her best effort in this course. During the last interview, she shared that "I wanted to get good grades on every course so that's one of my motivations." This unfortunately indicated an absence of strong intrinsic motivation in her case.

### *Task Value*

Eight students believed the course was relevant and helpful for them to achieve their goals. Cindy thought the course would have framed a lot of her other goals for her doctoral study if she had taken it earlier. While Tyson did not care too much about specific course tasks, Ally did not want to jump to a conclusion at the beginning of the semester because she thought the usefulness of the experience would be dependent on the whole-class interactions as well as the participation of her small group members. Tate believed that usefulness would be dependent

upon the fine balance between using off-the-shelf evaluation models and having room to explore deeper ideas and develop sophisticated instruments.

To those students who had high task value beliefs, much of the usefulness was attributed to authenticity of the course tasks, which required direct application of learning in real-life project environments. Carrie saw much value from not only her team's actual experience of resolving issues that emerged from everyday occurrences with clients, but the other groups' project progresses and issues. With a belief in experience as a guiding factor for the future, Gary trusted that his real-life experience in this course would help him more than book knowledge would in terms of building his consulting resume. Mia had an insightful comment on the authentic aspect of the course in her first interview:

I think we have a situation where I feel somewhat in an apprenticeship, you know, situation. And I feel that [instructor name] is extremely knowledgeable and he is sharing his knowledge with us and guiding us in a direction so we are not floundering everywhere. So for me, it is helping because he is wading through the literature and helping me to focus on what is important.

The course materials were also reported as helpful for learning the content and thus for meeting course goals. Katie liked the fun elements in some of the presentation lectures, which helped her not to get bored. Furthermore, she got a chance to learn how someone else ran an online course. Mia appreciated the diversity of media in addressing rigor in the various study materials. To her the different types of materials complemented and reinforced each other very well.

### *Self-efficacy*

According to the Student Profile Survey results and the first interviews, the students had high confidence levels in doing well in the course at the beginning of semester. Their assurance came from their general confidence in their own academic abilities and from their decisions to

make efforts, showing virtually no direct correlations with their reported entry knowledge and skills in evaluation. Confidence in some course factors also helped students in gaining an optimistic outlook. To Carol, knowing that there was a person helping her “getting some quality information” was crucial. To some extent, the very knowledgeable instructor was a guarantee in this respect, thus giving Carol sufficient confidence and helping her to make an enrollment decision. Mia was impressed by both the design and management of the course, which further enhanced her already strong faith in her ability to be successful. Similarly, Katie had been very confident about every course she took and could not see any reason not to accomplish what she wanted for this course, given the course set-up as well as her determination to work hard.

Meanwhile, some students emphasized that their strong confidence in themselves did not necessarily mean equally high confidence in every aspect of the course experience. They indicated their overall confidence would also be dependent on factors other than their own abilities and efforts, such as group members and actual interactions with clients. Carrie was very positive about her own performance but was not completely sure about the results of group collaboration:

I think I will do well. It is going to be difficult to judge because I think we are going to be graded as a group. And I don't know the strengths of my group members. So... but I don't think I'll have difficulty with the content. And so far I think that we have a good group and we all want to learn and we'll do our best.

Gary expected to experience a learning curve in terms of dealing with clients for the first time. Although the course provided general guidelines for doing an evaluation, Gary was prepared for the differences between book learning and reality as well as the unpredictable. It was his belief that he would not really understand the specifics until he really experienced them for himself:

I feel pretty confident in my own abilities. Whether the course deals with that or not is another issue. Because I think the course gives us some guidelines, very general guidelines in the things that we read in as well as the things we watch. But when it comes down to it, the concrete experience is always going to be somewhat different. So there's that difference then. So meeting with the client yesterday...I was very nervous because I didn't know exactly what to do. I knew some guidelines, you know, I watched the PowerPoint and went through the readings. I've done all the readings and all that, discussed these things with my group. But when it comes down to it, getting certain things out of a client is, is just almost more of an art than a science because you are dealing with a different person each time. So each client that you are going to meet is going to be different anyway. So there's no way to figure out exactly what you need to do for each meeting beforehand. I think you, you know, you just have to go through the experience to understand some of the things that you learn.

Tate made a similar point in saying that the client's availability for personal interactions would make a difference. However, in spite of all the unknowns, Tate thought his course outcomes would ultimately depend upon his effort and his decision about effort-making. In other words, the extent of confidence and the eventual learning outcome would be the results of his choice.

So to be honest with you, it's to what extent I'm gonna put the work effort into it and the thought. I'm saying I think there is a big problem here. Now it's up to me to do something about it. So I see this course and its success meeting my objectives is completely on me. Not on you, not on [instructor name]. So if I don't do well on this course, it's my fault, well, a little bit your fault. But in terms of me meeting my objectives it's completely on me.

### *Motivation Change*

While Carrie, Mia and Tyson claimed fairly stable motivational states throughout the course period, the other students reported some extent of fluctuation in self-efficacy or general motivation. Group work, evaluation project related issues, and work load were the main factors that influenced student self-efficacy and motivation. In some cases, students' self-efficacy directly tied to their general motivation; the change in their confidence about the learning outcomes consequently resulted in motivational decrease and changed learning behaviors. In some cases, the students experienced minor frustration or motivation change, which did not

cause much actual “damage” to their learning. Conversely, two students (Katie and Karol) reported positive motivation changes when their stress or confidence levels rose.

Six students reported various extents of negative motivation change over the semester. Some of them, such as Gary and Tate, first experienced a decrease in self-efficacy, which resulted in a drop in an overall in motivation. One of the apparent reasons that caused such changes was unsatisfactory group collaboration. As several students anticipated earlier in the first interview, their confidence in achieving optimal learning outcomes was dependent upon the performance of their groups as a whole. Not surprisingly, some who experienced group issues found that their confidence as well as motivation fluctuated as the group work moved along. Such changes further affected their course activities. The most typical examples were Gary and Tate. Tate experienced two unpleasant incidents with his team leader as a reflection of a personality clash. Both incidents hurt Tate’s feelings and ended in Tate leaving the course for a few days to “cool off”:

That was a little more personal, I guess, incident that really kind of offensive on a personal level. So... That one really made me get away from the group. There was like three days, I just can’t, I can’t deal with this, or I’m going to say something very bad and make an ugly situation. Somehow that burned, that reduced my motivation to work with the group specifically, personally.

Moreover, Tate had a particularly strong personal interest in evaluation and very high expectations for producing a quality evaluation project, which exacerbated his disappointment with his first group deliverable:

My confidence changed a lot. We had our teeth kicked down our throat when we tried to submit our first summary evaluation, evaluation summary, whatever.

Gary is another student who reported strong influence of group situations on his motivation and action. His frustration with group members did affect his “feeling about the project” and prevented him from working on the course as actively as he would have liked.

Sometimes when the group did not work well, he worked on other classes instead. When the group dynamics gradually changed and some members became more active, Gary felt more confidence in their ability to accomplish the collective goals. Therefore, Gary's confidence and motivation ebbed and flowed with the level of collaboration of his group.

The second factor that affected the students' motivation was project progress. Gary was very concerned about time as his team spent two months on just doing the evaluation plan. He also felt frustrated that certain things that their client was supposed to do were long overdue, which held his team back on their usability testing. These reduced his confidence in successfully meeting course goals:

Things, kind of setbacks, came. I think that I felt little lower confidence. I wondered if it was my team, if it was my leadership that would make that happen or something that I had done or something that we had done as a group that was too slow. So...that kind of went back and forth, depending on if we were succeeding or not.

Cindy's group also came across a situation where they got stuck due to uncontrollable reasons, which naturally affected Cindy's confidence.

It has fluctuated when I thought we weren't going to get any better because we have blizzard here, so schools were all closed. So we couldn't get in touch with schools, and we couldn't get in touch with the students who were doing out exam.

It fluctuated when it was low because some of the students didn't respond and some didn't come back out.

Workload and performance were two additional influential factors for the students' self-efficacy and motivation in the course. Tate shared that the busyness of his weeks was indicative of how much he felt like participating in the evaluation course activities.

Some weeks being very, very engaged in one...making postings and thinking those issues and being active with my group. (Some weeks) I think I even missed one week of forum posting. So a great deal of variance.

Ally reported feeling overwhelmed by all her course work, feeling a little bit of “rebellion” toward her work that made her put off work a little, and eventually indicated that she would “have to push through.” Jane described the semester as “really hard” and felt that she was being “hunted down” by another course. As a result, she did not have much time for working on this evaluation course and could not follow the course activities, which proved a significant detriment both to her learning of the content and to her confidence. At last, she frankly said: “I lost my confidence. I also lost my motivation.” Sheri reported a motivation change pattern in all her courses:

At the beginning of the semester, motivation is high. But during the semester, it was low, and then at the end of the semester it’s higher.

Sheri’s motivation for this course was no exception. Similar to Jane, Sheri’s difficulty in keeping up with the course readings lowered her confidence. Additionally, she got very disappointed by her third quiz result and felt quite disheartened thinking that she would not be able to eventually make an A.

The motivational aspects of Carrie’s, Mia’s, and Tyson’s personalities appeared less vulnerable to external influences, although Mia and Tyson both had some issues with their groups. Part of the reason might be that they knew exactly what to look for when they were doing something. Mia’s group problem was so serious that it ended up with reorganization of the four members into two new groups. Tyson felt that one of his group members was too dominating in the group process. However, both did not think that their motivation was affected because they believed that they had enough life experience to get over unpleasant things and focus on what was most important for them instead:

My motivation for learning has nothing to do with group work. It’s strictly information. I want to know the information, and I don’t really feel like she is getting in the way of my obtaining information. I don’t think group work has anything to do with my obtaining

the information... This is my what 20th year in school. So I mean if I haven't gotten use to this by now, I probably shouldn't be here. (Tyson's response in the second interview)

When you are young, it's more difficult to stay focused because you are distracted by things...for example, I could have gotten distracted thinking "oh, this is my whole world...what was happening?" But I know it wasn't. I knew I had choices. You know so I never worried about it and I had confidence in who I was and in my ability. Other people can try to portray me however they want to but it doesn't matter to me if it's not me. I know who I am... It's a true temporarily stumbling block.

(Mia's response in the second interview)

Interestingly, Tyson and Mia demonstrated different behaviors in response to their group situations. Specifically, in his later group work, Tyson made adjustments by "just sitting back and doing what I am told to do and not really saying anything about our group at all." This implied that without knowing he might have been affected by the group dynamics, although his motivation could still be intact. In contrast, Mia tried to reassure and motivate Ally with her unwavering faith, enthusiasm about the subject, and past experience:

I know Ally is concerned. I think [instructor name] is concerned as well that we should be gathering data right now. But I've worked in technology long enough and with computer science people to know what they can do when they'll do it beyond what it takes to get it done. So I'm confident yea I have confidence in my...things will get done.

(Mia's response in the second interview)

Karol and Katie were the two students who actually experienced slightly stronger motivation at times. Working on a real task for a real client, Karol viewed the associated stress more as a "sense of urgency" to complete the work with a certain level of quality. To her, there were things other than grades, such as "reputation and connection to the community." She believed her work actually "matters to people" and in turn this enhanced her motivation. Nevertheless, Karol still admitted occasional minor frustration when people involved in the evaluation did not "call back." There were also times when it was "a little bit nerve-racking" for Karol because she saw the project as "one shot" effort and tried to ensure everything was done correctly. Since these feelings were "nothing dramatic," Karol maintained an overall high

motivation most of the time. A big part of Katie's motivation growth came more from within as she described herself as very "self-directed and very motivated" and thought she was able to do "a lot more" than she ever thought she could. She also explained her way of turning stress into motivation and avoiding letting it become frustration:

I just want to get it done. I don't like the stress to go on for long periods of time so usually I'll just say: "Ok, this has to get done so that I can relax." And that stress is very motivating to me to a point. Once I get way too well, ok, stress is motivating to me as long as I can do something about it. So as long as there is something I can do in the course or whatever to advance whatever I need to do then I'm fine. But when it's just frustrating and there is nothing I can do about it, these deadlines are hanging over me and I'm waiting on somebody else to get something done, then the stress becomes frustration. So I just tried really hard to keep things moving in a direction for everyone. So if somebody was gone then you know the rest of us would try and be working in a positive direction until you know all of us could come back together and make decisions or whatever. So it was very stressful in that manner and I think it did motivate me most of the time but occasionally it was just frustrating.

By stretching herself in terms of effort and time, Katie managed to accomplish important work in an extremely difficult semester, which in turn greatly strengthened her confidence:

This was a really difficult semester for me because I had so many things happening and other courses and stuff. But after I finished and especially after we finished our final evaluation I felt like I could do anything. I just I gained so much confidence in myself and what I can accomplish and I also gained a lot of confidence in being able to deal with an online course. I didn't know how that would be I was nervous about it and it was hard and it was a lot of learning there is a huge learning curve for me I think. But I feel so much more confident in what I can do now.

### *Motivational Strategies*

The students reported various strategies to keep themselves motivated, especially when they experienced drops in motivation level. Some of the strategies were more associated with intrinsic motivation, such as learning, experience, and self-image. Some came more from extrinsic goals, such as completion of course requirements and getting grades. The others were neutral or difficult to classify. In summary, the students tried to stay motivated by self-persuasion, doing/action, using extrinsic motivators, seeking social support, and discipline.

One type of motivational strategies dealt with self-persuasion that involved revisiting original goals and envisioning good prospects for future benefits. For example, Carrie tried to “think about the big picture and why I am doing it.” She also added:

I talk myself into, into it. Cause yea I think I’m only on week five. Am I going to be able to do it all? And then I know it’s manageable. I guess I’m motivating myself because I know there is going to be an end.

Gary tried to realize where he needed to be and what he should be doing as well as reminding himself the goal of getting his Ph.D. At times, Gary also thought about what the client would be looking for, what he would get out of the experience, and even imagined himself getting a job in evaluation.

The second type of strategy is self-motivating by taking action. When Ally’s motivation was challenged by busy coursework, she would get things done right away and moved to the next course. She also rewarded herself for finishing some tasks by taking a break or going to a movie. As a group leader, Gary’s motivation was closely related to the group performance. So Gary tried to “remain upbeat” all the time or at least “put on that face” and “acted motivated.” He also tried to encourage group members by saying things like “we’re getting things done. We’re doing well, and we just got to keep working.”

Jane and Tate reported use of extrinsic motivators to adjust their motivation to the necessary level. Jane thought it important for her to get good grades for her courses. Though she did occasionally dream of dropping all her courses and taking a long break, she could not be clearer that she did not have any choice but to plough through. Tate got very unmotivated during the semester, but he did not motivate himself more than to “satisfy the minimum requirements of the course” “simply out of the desire to check that off the list.”

Cindy used social support when she experienced low motivation. By sharing frustration with her husband and some colleagues, she could learn to think about things from alternative perspectives, which helped her to refresh her motivation and pick up her courage again. Highly determined and confident, Mia did not admit any change in motivation even though there were very emotional moments in her group process. The key to her always strong motivation was merely her “discipline” and her faith that she “had done the best” to learn and had become a “competent responsible professional in a field.”

*Research Question 2: How does the environment affect students’ self-regulated learning and what challenges do students encounter?*

Four aspects of the course environment impacted the students’ learning noticeably: authentic tasks, online discussions, group work, technology and other helpful aspects of the course. Table 4.18 summarizes the specific impacts of these factors.

Table 4.18

### *Authentic Tasks*

Use of authentic learning tasks was designed as the center piece of this evaluation course, since it weaved together evaluation theories, tools, and techniques with their application through real-life project experience. The student interviews well supported this intention as almost all students thought the authentic evaluation project as the most successful course element that had assisted their learning considerably. The influences of authentic tasks on learning occurred in several ways:

First, authentic tasks promoted learner motivation through increased accountability and a realistic feeling. For example, Ally’s client was one of her former professors, which made her desire to present a valuable evaluation report even stronger. Ally sometimes felt the project too

exciting that she did not do as much reading as she should have. Gary clearly indicated that his motivation was tied to the project. He even reported that the mere thought of being able to meet with the client was an effective enough stimulus to him because he needed to please him by doing a good job and hoped to establish some future relationships. Carrie agreed that her group had to do a good job and try to be as professional as they could to meet their client's expectation. Katie even viewed herself as a representative of her university, which motivated her to make the best effort for not only her client but also in her group and in the class. Cindy commented that her interactions with the client and with her "very centralized group" made her feel "realistic" and excited.

Second, authentic tasks deepened students' understanding of academic content and widened their scope of learning through ill-structured problems in reality. Mia gave a clear account of how the project affected both her learning and her way of learning by helping her making connections between book knowledge and practical application.

What I meant by scan the readings is I scope what the week's work is so I'll scan everything before I sit down to do it...because actually I would be spending more time with the course material. Because given the context of the project, the course material is more meaningful. I know what problems I have. I know what information I need. So when I'm looking at the course material now I am looking not only to read the general material but to solve specific problems. What I do is I first scope the material from the class to see how it influences the project. Then I set it aside go attend to the project and go back and forth. And I also go back to materials we have gone over before. So I try to make more I try to meaning out of what we've done.  
(Mia's response in the second interview)

Katie liked the complex problem that project presented within the group context, which made it a good learning experience for her. In addition, she learned a lot about how to learn in such an environment. Karol also appreciated the complexities that the authentic task and group collaboration elements created together in the course:

I think that the team aspects, more than likely people would execute it in a team any way. So in that sense it's both real life but also you are getting the social nature of learning the group thing that happens sometimes when you're collaborating together...but also the discussions— being able to discuss ideas and topics online— and then the execution of the authentic task. It's real. It's complex. It's not removed from reality. It contains all the complexities that you would have in a regular evaluation. So then you are also encountering all the problems and the red tape and everything and having things from start to finish gives you an idea of the full spectrum of what it entails and how much work it is and so forth.

Carrie learned much more from the project by linking concepts to what they did for real.

Otherwise, she would just “do assignments”, “quizzes and just a research paper about e-learning evaluation”. Gary described this course as much more difficult than his other courses because it was way beyond “getting the right answers on a test”. Rather, this course was about “pleasing more than one person, making it more real” and making the client feel what they did “useful for him”. Furthermore, this experience became particularly beneficial for him because of plan to independently conduct evaluations in a consulting capacity in near future.

Third, the course also showed some less desirable effects associated with authentic tasks. Stress and frustration innate in dealing with real-life situations was the most obvious aspect. Almost all students reported various extent of stress that they experienced during the project periods. The team leaders' feelings, such as Gary and Katie, in this regard were even apparent as they shouldered a lot more responsibilities than the non-leader students in order to move the project forward by ensuring functional group work. There were many things causing concerns among these novice evaluators, such as awful weather, unresponsive teachers or students and disorganized clients, most of which were beyond the students' control and caused delays in data collection or intervention implementation.

Another pitfall stemmed from the fact that students only got the direct experience of part of the things (e.g., evaluation tools, methods, and techniques) being taught. While they might

have gained much strengthened knowledge and reality-tested skills on what used specifically through this experiential project, the students sometimes did not have equal mastery of the other material, since a single experience did not allow application of everything taught in the course. Gary and Jane had similar observations about their learning not being “well-rounded” in their third interviews:

One thing about doing an authentic task is that you don't have the opportunity to do everything that's in the textbook. You have a whole bunch of different things that you learn about in the textbook, and you can't really do all of those. And still come out with a real world task, you've got to pick the right ones for your client. And so I wasn't able to learn those techniques that that we didn't do for our client very well except for my basic knowledge for reading and listening to the presentations. That was a little bit more difficult— I think what knowledge I did gain on the items, that I did have was very useful and so I felt like I learned I got my goals with that knowledge. (Gary)

I think that the project to some extent affected it (his learning) because we had to learn certain things in more depth because we had to apply them. And we didn't have to apply other things so we didn't probably learn those as much. (Gary)

I'll say one of the ...of the authentic task might be like I wasn't able to apply all of the contents that I learned. So some of the contents I will know much about it but I would (not) have known other things, other contents a lot. (Jane)

One additional issue about authentic tasks was that some students perceived some artificialness in the learning experience. Tate, Tyson and Karol found the course' “manufactured” authenticity in some ways. Tate felt their evaluation project came more from convenience than from a real need for evaluation, but at the same time he admitted this approach much better than most other approaches for this subject and his project was “as close as” they could get. Tyson did not think the experience was real to him because of the artificialness of the scheduling, their novice status in terms of evaluation knowledge and skills, as well as the instructor's purposeful “setup” for the students. Karol shared a similar feeling of artificialness in term of timeline and suspected a real evaluation might take six months to a year from start to

finish. This very keen observation explained the time challenge that some students felt, which will be described in more detail in a following section.

### *Online Discussions*

Compared to last offering, the students participated in online discussions much more actively this semester. The possible reasons could be much less technical difficulty, a larger number of students, additional discussion questions, and an explicit minimum postings requirement. An analysis of the students' interviews and their discussion postings led to five interesting observations: content learning from online discussion, postponed posting time, attitudes about being the first one to post, online discussion expectations and approaches, and adjustments in discussions.

*Content learning from online discussions.* Online discussion forums provided a space for whole-class interactions in the course when the students addressed a required discussion topic that directly related to the weekly readings and an optional discussion topic that allowed the students to talk about any topic of their interest. Much learning happened when the students shared various perspectives on given questions and provided all kinds of information directly or indirectly related to the course materials and projects. Tate, Mia, Jane, Gary, and Carrie clearly indicated their positive feelings about the discussion forums and shared how they had benefited from their peers' sharing of opinions and resources.

It's interesting reading through the discussions and people's comments. I find that in some weeks, I'm reading and thinking: "Oh, my Gosh! These people are so intelligent. I don't know any of this stuff. And other weeks I think, you know, I feel like "ok, we are all thinking the same. Cause I guess it's a vast amount of experience with all of the groups. But I like that its there's people from different...like from the states and from Australia. Cause a lot of people put in different links and tools or web sites that are areas of interest, articles that they've read. So it helps broaden the concepts that we're learning that week. It broadens the topic for us. So it's been more than working in a group like this. I don't know if it's because it's online. Some people have said that they provide a lot more information and they are more verbal online because they are writing rather than in

a class speaking. So I think as a student, I'm getting a lot more from the other students than I probably would in a classroom. (Carrie's response in the second interview)

I see peoples are really like active in this course. I saw them write their daily discussion. I kind of admired by that. I kind of envy those people who really good at discussion. Cause I saw the other people having discussion with really great knowledge, but I think my self is not that good. Like I said on people or just like voluntary made posting, some good links if they found something so that's kind of like really helped me. (Jane's response in the second interview)

I think most of the thing that helped me to reflect and learn was the discussion board. (Jane's response in the third interview)

I think we even learned some on the discussion board with people mentioning different things I think we had a pretty in-depth discussion on different methods that could be used. (Gary's response in the third interview)

I really enjoy the discussion board area. (Tate's response in the second interview)

Some of the information that I saw from the other students as well as the course material. You know the outside links. I think those things were very helpful in terms of learning what the field is about. (Mia in the third interview)

*Procrastination on postings.* Ideally, students were expected to make contributions to discussion forums throughout the week in order to make idea exchange possible in the period of a week. However, a common complaint in the course was that people tended to wait towards the end of the week to post. In other words, the course calendar week started every Monday, and the majority of the postings were made on Saturdays and Sundays. At beginning of the semester, there were still some earlier postings, but as time went by middle-week postings became more and more sporadic. This had considerably deterred active knowledge construction and caused a lot of frustration among the students.

You like to get things done right away. I'm the kind of person that wants to get everything done. And then I don't have to wait for three other people to post so that I can post my responses to them. So, you know, you'll see one posting and respond to it. And then I'll post something that is my original discussion, and then I'll have to wait till Friday or Saturday for somebody to actually post more so I can respond to the other two. Those are frustrating. (Ally's response in the first interview)

It's hard to hold a discussion when people aren't there and when you want to discuss. For example, the discussion board seemed to do a lot of their discussing on weekends, which is really hard for me because I have children and family and everything. So weekends are really hard for me to try and discuss. Whereas if I had a choice, then I would do more involved in a discussion during the week when my children are in school and stuff. So I just had to know that I had to plan extra time on the weekends to be part of the discussions. And I could comment during the week, but it felt like the largest part of the discussion didn't really happen until the weekend so if I didn't plan on doing that then I would miss all of that. (Katie's response in the third interview)

What I'm not satisfied with is the lack of timely participation. Because I think you've noticed that most people post in a frenzy of Saturday and Sunday. And this week I just waited until they posted because it was just like two or three of us were by ourselves the whole week. And everybody else participated on Saturday and Sunday. So until Saturday and Sunday you don't have enough people to have you know a dynamic exchange. You miss out on the learning. So I think the procrastination is troubling. (Mia's response in the first interview)

I did enjoy this part of the course but there were definitely stronger participants than some. I sometimes felt intimidated by the level of discussion and sometimes miffed that nobody responded to my comments. I was particularly annoyed with the great number of responses posted so late on Sunday evenings. (Anonymous comment from Course Evaluation)

Multiple reasons contributed to the delayed occurrences of discussion postings.

Specifically, Jane worked on her course work based on deadlines and did not start working on her readings and other tasks including online discussion until one or two days before class on Mondays. She and Sheri had also reported difficulties in keeping up with course readings later in the semester when things got busy, which might have reinforced this pattern of late postings. Mia, although did not wait until too late to post her thoughts, intentionally wait to read others' response and think before she did her own. Tate enjoyed the evaluation course as well as the discussion a lot but could not help putting off things sometimes as a result of "lack of self-regulation" in his own words. Cindy wanted to be the earlier or middle pack but disliked being the first one to post.

*Attitudes towards being the first one to post.* In this cohort of students, there seemed an inclination to avoid making the first discussion postings. It was interesting to find that some students complained about nobody contributed initially but did not to take the first step themselves. This don't-be-the-first mentality might be related to personalities as Ally commented.

I think people are uncomfortable being the first one. I know I am. I think it is a personality thing. Especially when there is a discussion, I'm not the first one to talk. I'll talk afterwards. I just don't know how to. But I feel there are people who always like to jump out first. When there are two people I like to be first. (Ally in the first interview)

It might also have something to do with personal preference. For example, Cindy was rather particular about the timing of her postings — can't be too early or too late.

Normally I try to either post in the beginning or in the middle cause I hate posting first. I hated posting first because when you post first you have nothing to respond to. You just have to wait. I'd say if I'm in the middle of the pack, I prefer it then...I don't know. I guess somebody has to be at the end. (Cindy's response in the third interview)

Mia's decision on not being the first in discussions was a very deliberate one for two reasons. On one hand, she did not want her formal language style to stifle others' interest in expressing their ideas in less formal writing; on the other hand, she felt that some other people enjoyed posting first and she was willing to give them that opportunity.

My language is slightly different, slightly more formal. My language may be sometimes more professional because I've been at work for so many years. I think the language combined with something I might say might alienate people. And I don't want to do that. If you notice the conversations are sometimes very personal, very casual whereas I try to do it professionally based meaning— “this is research that I've found...”, although I am finding increasingly more students are including more research. I don't want my language...because I learned British English. That was my first English that I learned. So my English is slightly different. You know in twenty years in technology I have a different vocabulary.

Because other people get to post and they are excited about it. The people are excited about posting first. So why not let them have their joy.  
(Mia's response in the first interview)

Tate was probably the person who Mia referred to as he personally loved online interactions and clearly recalled a few weeks when he jumped right in the discussions as soon as they were available. Tate further clarified that his motive for doing discussion early and actively was to attract classmate's attention and opinions.

Survey design I was the first one to respond to I was very interested in because I could talk about my observations about survey instruments being very blunt instruments and not, not only not measuring the right things but in turn giving us conclusions that I think are misleading and ultimately can be dangerous so.

Let's admit it. I want people to read my stuff and comment on it. So if you wait until Sunday, then nobody's going to read it. So...yea...I log on a lot probably to see if my things are being commented on.

I want I have strong opinions and I want to say them and hopefully it will catch somebody so. (Tate's response in the first interview)

Gary was one of the few early birds on discussion boards as he always completed his work on this course fairly early in the week. However, in order to avoid being the first one every week, he sometimes intentionally waited by noting down what he had to say while the readings were still fresh on his mind and saving the actual postings for later. Carrie did similar things by sometimes holding her ready-to-post original responses to the discussion topics for a couple of days. During this time, she read through others' postings, made responses, thought about her own postings for one night and at last submitted it on the following night.

*Online discussion expectations and approaches.* The students had varying views and thoughts about online interactions and discussion quality, thus approaching the discussions very in very different manners. Specifically, Jane and Sheri, the two international students, often felt somewhat intimidated to post and therefore appeared a little passive in participating in online discussions. Jane thought the high quality of her classmates' postings made her back off because she knew little about the subject and worried that others' would laugh at what she had to say.

This feeling of Jane did not only occur in this course—“In the real face to face classroom, it is even more intimidating to me to speak up.” Additionally, even though she had a desire for communication, Jane did not feel like posting in the provided discussion forums because those, including the optional, more free-style ones that were intended to encourage any conversations about evaluation, all seemed to her very “serious” and “scary”. What she really wanted was a space to socialize and ask for help. The reason that Sheri would like to share more ideas but did not do so much was very similar to Jane’s. However, she expected to be invited for participation due to her lack of confidence in communication skills.

Students like Ally, Jane, and Carrie also indicated a preference for more direct responses to their postings or the discussion questions. Carrie, in particular, did not like people going off topic or at least did not encourage such conversation. Therefore, when there were not much targeted responses, they tended to lose interest and enthusiasm.

On the discussion board I didn’t really have feedback for my opinions so I would say like it would be good to have feedback if someone did not get any feedback. I don’t know. (Jane’s response in the third interview)

I felt some of the postings were unanswered. It just isn’t encouraging anybody to express their opinion. (Ally’s response in the third interview)

Sometimes I just didn’t respond cause I thought: “Well, it’s really not anything to do with the question and I didn’t want to keep that conversation going. And I certainly wouldn’t have said “we are way off topic”, but I wouldn’t have tried to guide people back to the original question. (Carrie’s response in the third interview)

Tate and Tyson were at the other end of the spectrum as they appeared too “aggressive” even “confrontational” in some students’ eyes when people were not familiar with each other’s style at the beginning of semester. Generally speaking, both of them preferred candidly sharing their critical thoughts in discussions. Whereas some students tried to be careful not to create misunderstandings or lead to information misinterpretations because people get insulted more

easily online without seeing the body language and other cues, Tate felt that most of his classmates had been “too nice”, which he believed did not bring about really meaningful idea exchange. He found the postings that only showed agreement to others “annoying.” Among his peers, Tate selectively interacted with three or four people “who identified big important issues”, “who question things”, and whose “chief priority is not making other people happy.” Tyson was one of them. With an engineering background and enjoyed “the early Internet discussion boards where people felt a bit freer to have heated debates and discuss the differences”, Tyson observed the difference in interaction styles between him and his education major peers in and outside the course. Like Tate, he was unsatisfied with “people sitting around agreeing with each other” and complained that “there is a lot of noise but not a lot of content.” However, after he made “a little bit more aggressive posts” and wanted people to “back their statements up,” he was aware that a lot of his classmates felt upset and then he got tired of the discussions. Although Tyson had a reason for using his discussion approach, it was perceived very differently by the others as one anonymous comment from the course evaluation indicated:

I hated having to post each week because I knew someone would find some nitpicky thing about the post and explain to me why what I said was inaccurate.

*Adjustments in discussions.* As the students got familiar with their classmates’ patterns and styles in online discussion, some adjusted their own way of responding. However, these specific things might or might not have changed the whole class dynamics for the better. For example, in response to the general tendency of posting on weekends, Katie, Karol and maybe some others “learned” to do their own postings later in the week as well. In Carrie’s case, the lack of direct responses to her postings made Carrie wonder whether she “is not answering properly” or “they don’t care”. Consequently, she “backed away” from responding the way that she would have normally done. Towards the end of semester, she returned to her old way by just

“saying what I want to say because nobody’s going to respond anyway.” Both types of changes reinforced a vicious cycle in which the students made original postings late, responded to other’s postings late and in an indirect manner, and then received no direct responses to their own postings in return.

The initial “rough” discussions impacted not only the people being challenged but also some onlookers. Ally and Carrie both admitted to have backed up from the discussions, and Ally even spent a lot of time thinking what “they” are going to say before she posted. Cindy also heightened her sensitivity in both her discussions and collaboration in the course:

I was a little more attentive. And say things and expressing myself...because I didn’t know the people well enough or I thought I didn’t know the people well enough to respond the way I normally do.

After noticing the negative feelings and dynamics that his discussion approach had aroused, Tyson quickly gave up what he thought should be happening in real, constructive discussions and instead “toned down” his responses.

Because it just makes me look negative. And you know other people don’t want to have conversations in the same way that I like to have them, especially education majors. For example, I get the feeling that they see any disagreement as being some kind of attack or something like that. So I thought I need to just shut up, and if I would just be with everybody like everybody else does, then it would be easier.

Tate reflected on what he could do differently and explained a very similar change in his way of discussions:

Probably be a little bit rough and make comments that cause trouble. Then I have to completely collapse inside myself, be apologetic and eat my pride. So I’m very dissatisfied with my strategy toward others. I can voluntarily do a better job of being critical but not making people defensive. (Tate’s response in the second interview)

Ally realized these change by the time of her second interview and described people as “more friendly”. In all the three situations, the students were forced to regulate their study behaviors

under the influence of their classmates due to the interdependence embedded in course activities like online discussions.

### *Group Work*

Working in a group was another big mediating factor for the students' learning in the course. Because this course included collaboration-mediated course experiences, group dynamics affected both the students' regulation of their studies and their learning. The specific impact of group work in this iteration is discussed in terms of four aspects: positive impact, negative impact, group leaders, and group work strategies.

*Positive impacts of group work.* The reported positive impacts of group work included: 1) learning from different perspectives and with stronger motivation, 2) completing a workload that otherwise wouldn't be possible for individual student alone, and 3) learning about working in a group. First, group work helped the students to learn from diverse perspectives and experiences. It also helped them to realize that when people work well together, stronger motivation can result. Mia, Karol and Carrie commented on their groups being good and functional, which assisted them in completing the course project and thus meeting course requirements:

I think that our group was the most influential part of it. Ally and I encouraged each other to go way beyond the expectations. So I would say the group factor was the most the strongest one. (Mia's response in the third interview)

I think for the most part most of the team members that we had were pretty good because most of them were very dependable. You know if most of them are dependable then you know you are going to get stuff done. (Karol's response in the third interview)

I think it is a very good group. We've had just a few problems getting together. We always meet on Monday nights and sometimes there has only been three of us instead of four. But we always seem to be able to make up for it through email. So when we do meet at they are a good group and we are moving ahead. We all seem to be on the same path I guess. (Carrie's response in the second interview)

I get along with all of them as well. I think for me it's been fine and very easy group to work with. (Carrie's response in the second interview)

Mia, Gary, Carrie, Katie and Cindy directly expressed their appreciation for the opportunities to draw from other group members for ideas and expertise, which made their learning richer and deeper:

I think it has given me a wonderful opportunity to learn one of the ways that I love to learn which is collaboratively. Because if you find people who share your values then are able to go beyond individual accomplishment you are able to expand your individual thinking to incorporate other people's perspectives not only in what you know but also add to what you know. So Ally has had experiences, for example, with these not-for-profit organizations like the United Nations and other organizations like that. And she has an international perspective. She also has a very ethnic perspective because you know her background is [Ally's ethnic background] and so learn differently than the rest of America in American public schools. And so that also adds a different way of learning which makes it much richer. So it's what you learn and how you learn that changes. (Mia's response in the second interview)

The group kind of a group brainstorming effect was good, having people remember things that they had learned in the course and come together on what they could be doing. (Gary's response in the third interview)

I think I've learned more I learned from each one of my group members and I mean they all have great skills and great knowledge. So for me I've learned a lot more from them than I can read from just reading it out of a book or whatever. Plus you learn how to communicate with them. (Katie's response in the second interview)

I really think there is value in small group work whether you have an authentic task or not. Just because it gave me...because I didn't know any of these students it gave me a smaller group to get to know and have somebody to bounce things off to be able to discuss things with a little bit... so I think that was valuable. (Katie's response in the third interview)

I like to learn in a group because you hear different perspectives, of what they were thinking of, or what people are doing. So in that aspect learning in a group, it's good for me to do that sometimes. Because I do believe that individually I don't have all the answers and that my way of thinking may somehow restrict my knowledge. Because I don't have other perspectives so with the group is good for me in that sense. (Cindy's response in the third interview)

Second, the evaluation projects in this course involved large amounts of work. Working with peers collaboratively enabled the students to draw on everyone's individual strengths to

complete work that would have been daunting to complete alone within such a short time frame. For example, Jane was not sure how to go about starting the evaluation plan at the beginning. Her group members explained to her in detail how they could work on it, which helped her gain confidence in making contributions to the best of her ability. Tyson admitted that if he had to do the project by himself he would either have to treat the single part of the project more shallowly or complete it over two semesters. The original group that Ally and Mia worked in split into two a few weeks after the semester began, which resulted in the two of them taking on the workload initially planned for four people. To meet the demands of their extremely time consuming evaluation project as well as the course requirements, Ally and Mia had to spend many more hours on data analysis and reporting and even gave up their Christmas holidays. Without any doubt, neither of them could have been able to finish the project alone, as Ally said in her final interview.

Third, some students, such as Tyson and Tate, learned how to work “appropriately” in a group. Tyson’s lesson was to just “agree with everybody” when he worked on discussion boards as well as on his group project because that was “the easiest way to deal with it—it takes less time and people won’t get angry at you.” Although his mentality could be very different when he got together with certain people, Tyson thought he would be able to do a better job “reading the atmosphere.” Tate thought the side effect of the course was to understand how to work with people successfully in groups when the unpleasant incidents in his collaboration with a group member made him reflect on how to be critical but not make people defensive. Tate further explained that when he was going to another group situation he would have a “definite sense of carefulness,” think about what would happen before taking any actions, play “a more positive role” and “really watch myself.”

*Negative impacts of group work.* The students reported four types of negative impacts when they worked in groups. An obvious problem of group work was the stress from working with group members and in some situations the demotivating effect of unsmooth or ineffective collaboration. Even though Gary's group had a positive overall collaboration experience, Gary as the group leader still felt a good deal of stress when one member failed to submit her part of the paper in time. This noticeably decreased Gary's confidence in successful completion of the team project. There were also other unsettling moments when he did not feel like working on the course project during the semester. Tate was the one who experienced the most emotional disturbance due to unpleasant interactions with a peer. As he confessed, his top priority at those times was to save himself from "explosion." In order to cool down to "maintain relationships," he stopped everything on the group project for quite a few days, including communicating with the client as the only point of contact. This experience further "negatively impacted" his "hopefulness for collaborating with people." Katie, the one who Tate had an issue with, was no better as she also had to put things aside for a while. However, her role as a team leader prompted her to get back to her normal state and try to resolve the problems as soon as she could. For the whole course period, Tyson did not put his whole heart in the group work even though he conscientiously fulfilled his responsibilities. Nevertheless, he still felt comfortable with one colleague, who in his words had a "very powerful personality," and decided to be a passive follower after his suggestions got "slapped down." Although this did not seem to frustrate Tyson, it did reinforce his "previous negative views about group work."

Second, to some students, being unable to do things the way they wanted caused them to feel hindered in their own learning. Collaboration means negotiation, reconciliation, and shared control over things. In group projects, the students had to accommodate other members, but not

everyone was comfortable with the loss of complete control. It could also be difficult to share honest opinions because that often involves respect, trust, and emotions. Tate, Tyson, Cindy, and Sheri indicated that they would have approached the projects and thus their learning differently if the processes did not involve collaborators:

Group work in this particular course has done nothing to enhance my learning. It's probably held it back. Well, if I had to do the whole project by myself I would have had to pull down deeper into myself for a wider range of instruments—maybe in areas where I was less confident, have to go out and actually use some resources and it might have been a more complete process for me. Because I got to choose the two I was comfortable with, you know, it's fairly smooth operation. (Tate's response in the second interview)

Trying not to get too involved because it's not worth it if I make a lot of comments and this one powerful personality slaps them down. So what's the point? So now I'm just taking a very passive role like I'm sitting back you know waiting to be told what to do and doing it. (Tyson's response in the second interview)

Sometimes I can feel like I'm being kept behind or kept back from doing what I want to do and where I want to go. (Cindy's response in the first interview)

I collaborate with the others I didn't like that. When I working alone, I did my best but then collaborating with others, I feel I don't know. When I do my best and I try to get more...for better ...when I work alone, I can just totally focus and in charge of everything. But when I work with other people usually there is a division of work. And other people complete their parts. I provide feedback like not...cause I'm afraid that might hurt other people's feelings. I give feedback when there is something really wrong. (Sheri's response in the second interview)

Third, some students believed that they would have learned more about the content if they worked on the evaluation projects by themselves. The approach all the groups used was dividing the overall task into different parts and each member choosing the ones they liked to work on. Although working on their own would definitely mean a lot more work, Tyson, Gary, and Sheri thought the opportunity to experience everything for themselves would help them understand the evaluation concepts, tools, and techniques better than learning vicariously from their peers. Tyson also anticipated learning more about time management for this particular kind of evaluation project in that case. To Sheri, not doing the course project all by herself affected

her confidence in carrying out an evaluation independently because she was not certain whether she would be able to successfully complete the things on which her collaborators had worked.

Tyson and Tate identified the fourth issue with group work as too much time and effort spent on group communication, management and coordination, which consequently reduced the time that could possibly be spent on engaging deeply with the content:

There was a lot of energy spent just kind of maintaining the relationship. In a way we supported each other, kind of a cheerleader way: “Rah, rah, let’s do this.” But in terms of actually the skills used in the in the process is not so much. So lot of work just to make the relationships and communication and all that.

(Tate’s response from the third interview)

There might have been a little less of the actual content which was course evaluation. Because the time I spend on the course and... really this is true for anybody... I think the time we can spend on the course is limited. Then the time that we spend just doing group activity maybe detracts from the amount of time that we spend doing content activity, for example, organizing meetings and dividing up activities and deciding who’s going to do what. So for example, if I was doing a project on my own I wouldn’t have to do all of that organizational stuff. I would focus on content. (Tyson’s response in the third interview)

*Group leaders.* In group work, a lot of group responsibilities were shifted to the leaders. To manage the group successfully, they had to take charge of a series of group matters, such as facilitating communication within the group as well as often acting as a representative to work with the instructor and the clients, facilitating group interactions and meetings, coordinating and delegating group tasks, and putting together final group deliverables. Moreover, Gary and Mia also tried to motivate their peers to keep their spirits high during the challenging project process. In addition to regular project management tasks, a group leader sometimes took over additional work that could have been done by the members together. For example, Carrie reported that she did not look for additional resources for completing the evaluation project but her group leader, Gary, did. As a result, Carrie appreciated Gary’s great job in leading her group and his greater

contribution compared to “the rest of” the group. For the same reason, she had a lot of “respect” for him and was more than willing to work with him again if she had to choose a collaborator.

Three group leaders shared their thoughts about their roles. Gary admitted he felt a lot of stress in leading the project to a completion. Karol explained that the reason that she initiated things was “not that I perceive that role to be the initiator” but she thought “the others perceive that role to be the initiator.” Mia “asked for the challenge of being a leader” before her original group divided because of her interest in “facilitating the social interaction” and in exploring “setting expectations and holding people accountable to expectations.” However, in spite of her effort to better facilitate the socialization in order to engage the members, the members in her group still had a hard time getting along and developing shared goals, which was later resultant in the formation of two separate groups.

Therefore, voluntarily or not, the role of being a group leader appeared to help people become more active in their learning. Although not serving as a leader themselves, Tate and Jane both mentioned that if they were in that role, they would definitely act differently in many situations. Jane thought she would at least need to “interact more” to check whether the group was “on the right track.” Tate regretted not taking the leadership role because he believed himself to “act better to lead than being a follower.” At least, he suspected he would have handled things more positively if he were the group head.

*Group work strategies.* The students used a variety of strategies to work with their fellow group members on the course projects. The specific strategies were somewhat reflective of their roles in the group and their own learner characteristics, such as personalities, work style, and language skills. Overall, there were four types of collaboration strategies: group and task

management, group process monitoring and problem resolution, finding a comfortable way to work, and strategies to work with a member with extremely high expectations.

First, the group leaders used a few strategies to manage group operations as well as the collaborative projects. Since all the groups adopted a “divide and conquer” approach when each member worked on discrete parts of the project, the leaders were aware that people had to buy in to what they were asked to do and do what they were good at. Therefore, it was common that the leaders encouraged the members to take “ownership” of tasks by first asking members about their interest and expertise and then giving them the freedom to choose the task that they preferred to work on:

Not being bossy and listening to people. I try really hard to find out what their strengths are and let them contribute to the group in that way. So it's trying to match strengths with them. And you know match strengths up with task that we have.  
(Karol's response in the second interview)

We all have different backgrounds so when we split up the tasks well usually actually I think we all offered to I'll do this and we all chose sections that we were comfortable doing or that we knew things about. (Carrie's response in the second interview)

Generally I've tried to take the strategy of ownership allowing them ownership of the project as well as me. Since I've been the group leader, I knew that I wouldn't have much time to do a lot of leadership this semester because it's my first semester as a PhD. I'm trying to get a lot of things done. So I try to take the stance at the very beginning of the semester. I said to everybody: “I want everyone to kind of take some ownership of this project”, and I told them to explain to me what you would like to do each time and give me a lot of feedback on how things are going. (Gary's response in the second interview)

I try to get input from people before I assign something to them and try to try to give them responsibility so they can just kind of do the work the way that they want to do it.  
(Gary's response in the second interview)

Katie explained in detail how she tried to find out about each member's work schedule and organize and coordinate group activities in a way to optimize productivity:

I do have to be really organized. I've kind of had to find out what their time frame is. It's like what days are really good days for them to work. So it just feels like for my team Monday and Tuesday seem to be the best days to get anything done. So I just try and

make sure that I spend time those two days coordinating and organizing and getting my work done so that I can try and help them be more productive.  
(Katie's response in the second interview)

Second, the students had their own unique ways to monitor group process and resolve emerging issues. Specifically, as a group leader, Katie always made sure that members report problems and issues in a timely manner. For example, while she understood that everyone might have situations that stop them from completing their tasks, she wanted that information quickly enough so that someone else could "pick up the slack for them." Carrie kept alert when she was expecting something from the group by checking the course website frequently and asking her group members to email her with her so that she could receive updates right way.

How the students handled group issues was also related to their roles in the group as well as their personal philosophy about problem resolution. Karol tried to resolve the problems within the group first before considering contacting the instructor:

As far as getting along it you I am not quick to contact the teachers if there is like a problem in the group. So they feel it's better to try to talk to people directly first before getting them the benefit of the doubt, to try to work it out themselves or within the group before bringing in a kind of authority figure into the matter.  
(Karol's response in the second interview)

Gary had to take back the ownership of a task when a member failed to fulfill the responsibility within the agreed time frame:

When things didn't work out, in some cases we haven't had for instance a paper turned in on time. Then I had to kind of take back some of that ownership. So I gave ownership for people to do certain things and to, for instance, get the paper in on time, edit the paper, so that we didn't all have to come together as a group and try to do that. But when it didn't work out, I just had to take it back a little bit and say, "Well, I'm going to do the paper this next paper." When we got word back, I did the next paper real quick and just said "We'll talk about it briefly in the meeting and it will be done" so that I knew it would be done and handed in quick. (Gary's response in the second interview)

However, Gary did take extra caution and tried to reduce unpleasant feelings or misunderstanding by dealing with this issue face to face in a personable demeanor:

I had to deal with that. I had to talk to her and say, you know, “Can you get that in today?” when she had another class with me. And I tend to deal with those things...if I can I deal with it face to face just because you want to be sociable...and rather than writing an email that could be taken a number of different ways without your body language there.

Being a non-leader group member, when two other members could not get along with Mia, the team leader, Ally rejected their request to work against Mia and directed them to contact the instructor with their complaint. She did not want to take any side on the matter until the situation deteriorated to the extent that the group could not make any progress without fixing the dynamics problem:

Part of me wanted to take over like a Mom role and say that’s not nice. But I let it go till I felt like we were just not producing any products. And so I made that the focus rather than the attitudes. I said: “You know, we are not really producing anything. Let’s split the team up and get some work done.”

With the previous team, I tried not to encourage any misbehavior. They sent me an email trying to get me to agree with them that Mia was too aggressive and things like that. I sent them an email saying you really should talk to [instructor name] if you feel uncomfortable. But I am not interested in being the team project leader. They kept asking me to be that. I said I’m not interested. That’s I said I probably have the same problem cause I’m pretty frank and task oriented so.  
(Ally’s response in the second interview)

Third, Jane and Sheri used strategies they were comfortable with to overcome their difficulties in getting their points across due to language constraints. Jane’s preferred way of expression was writing, which allowed her to check grammar and avoid saying anything awkward as she might do when speaking. Therefore, when communicating with her group, Jane chose to post in their group discussion forum or send email messages as opposed to talk about her thoughts at group meetings. In Sheri’s case, her group leader Katie became concerned about Sheri because she was a little too passive in both group activities and online discussions. Since Sheri was more familiar with another group member (non-study-participant) who was her classmates in other courses, Sheri asked this group member to tell Katie that she was doing well.

Fourth, in her second interview, Ally shared quite a few strategies that she used to work with Mia, a very high-achieving student with extremely high expectations. The specific strategies included being sensitive and careful, mentoring at emotional moments, bonding and easing tension, and redirecting:

In terms of working with Mia, she is very straight forward. So indeed she can seem aggressive. But she's also very sensitive. So I have to frame my words or what I say very carefully. And I've been doing a lot of mentoring with her when she's upset about something. I tell her: "Well, the goal is to finish this project. Let's let that go and move on. We are pretty much the same age so we talk about what's happening in our lives and things like that. So that has helped with a bonding, and that alleviated some of the tension. But she is very, how would you say, task oriented. And she deviates, trying to battle these other things because it will be great to have these other things like a whole bunch of...maps and things like that she wants to do. But we just don't have the time. We are already behind. So I have to refocus her a lot.

After the team split when Mia when she wants to go on another tangent I tell her: "Well, is that on the rubric? Is that what he's looking for?" Cause we really don't have time. So I use a lot of redirecting.

### *Technology*

Technology seemed to have facilitated students' learning during this iteration. The Moodle course site presented more advantages than problems for most of the class participants. Although some students were new to this course management system, learning to use Moodle was not too difficult a process. For example, Katie thought Moodle was easier to use than Blackboard, which she had used previously at her institution. She was also able to successfully deal with a few occasional glitches or address some questions so that everything worked out properly. In addition, some of the Moodle's features were very helpful for students. For instance, Tate liked the feature of presenting little thumbnail images of people in discussion postings, which helped personalize online discussions and visually increased a sense of online presence. Gary found the email subscription feature extremely useful because he could receive every new

discussion posting in the email and that saved him a lot of time and inconvenience as he didn't have to frequently login and locate new conversations.

Nevertheless, as expected, technological issues with Moodle did happen. Luckily, besides a few temporary minor issues, most students did not experience much technical difficulty. However, it was somewhat unusual and unfortunate that Mia came across many types of problems from time to time, ranging from login failures to an inability to post messages in online discussion forums. To make things worse, when Mia could not log in to the course site at all, all the things that the team had posted under her name disappeared. This not only made her own learning process frustrating but created hurdles for group collaboration. Fortunately, as active and resourceful learners, Mia and her colleague Ally always found ways to work around the barriers. For example, Mia figured out how to combat the discussion forum posting problem by typing up her responses in a Word document and posting them as an attachment. When the materials posted under her name in both class public discussion forums and group discussion forums disappeared, both Mia and Ally kept copies of those materials on their computers, which turned some potential disasters into merely inconveniences.

Besides Moodle's role in impacting learning in the course, some students also used a variety of technological tools of their own choice to facilitate both group processes and individual learning. Almost all groups used the voice and text chat function of Skype for group meetings, and some used the same tool for synchronous private conversations between themselves as well as the client. Since Mia had so many problems with Moodle, Mia and Ally tried to avoid using tools in the course site and substitute with other tools that they felt comfortable and convenient using. Additionally, they used Windows Shared View when editing their documents. Karol's group mainly used Google Groups to keep each other up to date and

Google Docs for document sharing and collaborative writing. To assist with her own learning, Jane had a piece of software installed on her computer, which kept popping up task memos on the computer desktop every time the computer was turned on until the tasks got checked off. Tyson also utilized a web-based time and task management program to remind him of meetings, assignments, and other tasks.

### *Other Helpful Aspects of the Course*

Several other aspects of the course that were considered very helpful for students learning included course structure, materials and resources, open information sharing, and the instructor. Firstly, the increased course structure this semester facilitated the overall student learning by helping the learners integrate theoretical learning and the project experience through guided regular weekly activities. The students thought the organization of course content logical and reasonable. After a few weeks, the students got used to the consistent pattern of course activities and knew clearly what to expect, which helped them to feel oriented and get a sense of where they were heading and how they were getting there. Some even used the weekly outline as a checklist to monitor study progress. Below were a few comments from the third student interview showing how the course structure had helped:

The structure was good the structure was very, very you know it helped it helped that we had a starting and an ending and that we have objectives of reach week and you know we had some kind of dialogue of what to do for each week. So you weren't like floating. So that what helped. (Cindy)

I've heard bad stories about online courses but I think it's the way they are structured and this one was well structured and well organized. Because I knew every Monday I would get a new assignment and that I was required to respond to the question of the week and respond to at least three other comments. So I knew clearly what was required of me. And it didn't change from week to week. (Carrie)

I say the biggest thing is probably [instructor name's] weekly itemization, you know, his list of things to do. I mean that certainly made things a lot easier for me because I didn't really have to prioritize or anything. Because tasks were sort of assigned on a weekly basis that makes, you know, organization. if for example the first week of the course...if

he said by the end of the course you need to do all of these things and gave a really big long list then that would be more challenging because organizing all of that would be my responsibility, and I would have to figure out what way to do that. But because it was sort of broken down into weekly task lists, then that was an aid to my learning because I knew exactly what I needed to do over the next 5 or 6 days. (Tyson)

It was designed so that the schedule was very workable that we were given you know ample times to finish what we were set forth to do. (Tyson)

Secondly, the enriched course materials and resources were very well received by the students. Because the instructor had completely rewritten the course textbook before the semester started, the students did not report any concerns about materials unavailability. The practical nature of the main textbook made it an easy but interesting read on one hand, and on the other hand, provided students with understandable guidelines and advice for conducting their evaluations. The supplemental readings as well as the narrated PowerPoint presentations were also popular among the students. The presentations were particularly helpful for the students to stay motivated and engaged. Cindy, Gary, Katie, Mia and several other students explicitly indicated their intention to keep all the course materials and use them for future references.

Thirdly, several students reported satisfaction with the open information sharing in the course. Ally liked to visit other group's wikis to find out about their progress. Gary got some good ideas for his own work after reading others' postings on certain topics such as usability testing and then decided to help his peers in the same way. Jane, Carrie, and Mia all applauded the "unbelievable" amount of resources for evaluation and evaluation tools that their classmates posted in the public discussion forums. Mia shared an insightful thought on this in the final interview:

Without information there cannot be knowledge. You can have the best group in the world in terms of everybody getting along and being happy but frankly without information you cannot generate knowledge. So that's a foundation of learning, building blocks that you have.

Last, the students agreed on the important role that the instructor had played in supporting them through the challenging but rewarding journey of evaluation. They appreciated him being very organized and easily accessible via email whenever they needed assistance or feedback. The fact that the instructor met students (Katie, Cindy and Karol) from other institutions in person at a conference assisted students in getting to know each other and build relationships. Tate indicated he enjoyed the instructor's humor and would dread listening to a lengthy lecture otherwise. Tyson felt supported by not only the instructor's constructive feedback for himself and group but also his comments on other classmates' work. Sheri was special in her way of feeling supported as she reported: "I like [the instructor]. I want him to think my work is good."

### *Challenges*

In this course, the students faced four types of challenges associated with online communication and collaboration, time, authentic tasks, and learning evaluation as explained in detail below:

*Online communication and collaboration.* Most students identified online communication and collaboration as the biggest challenge for their learning in the course. Online communication and collaboration can be full of hurdles in itself. It is not surprising that a combination of the two in a course can create a very challenging environment by compounding these factors. Student comments revealed how communication at a distance could affect or have affected their online group learning:

Communication is very, very important especially in a project based class. Sometimes email or chatting doesn't really capture the real content or the intention of the sentence. So I think that is the biggest challenge. You can't really see the body language. Even when I talk to my husband on video, I still feel like there is something lacking.  
(Ally's response in the first interview)

There's a challenge with interacting with people. Recognizing some of the research findings about the sensitivities of people if you disagree with them. You know to disagree with them in a kind and constructive manner.

(Mia's response in the first interview)

Time and maybe (team) communication could also influence me. I think that's a challenge. (Jane's response in the third interview)

For online I think communication needs to be facilitated really well among groups especially you know for an online environment if you are going to do group work anyway. So if you are going to work on an authentic task, you have to be communicating really well. (Gary's interview in the third interview)

I've done other authentic tasks just like this in fact in another evaluation course. And it was stressful only because it was so much work but this made it more difficult because of the online collaboration. (Katie's response in the third interview)

The hard part is when you're not going to see that person face to face, it's hard to resolve any issues that there are. (Katie's response in the second interview)

I am feeling a little bit frustrated with the distance but I am trying to learn how to manage that and it is getting better. We learn most when something is truly hard for us so I am just trying to work through the difficulties and hope that I can help my team.

(Anonymous comment in Mid-term Evaluation)

Furthermore, the team communication itself was often problematic and consequently affected the collaboration. The following anonymous comments from the Mid-term Evaluation provided some specific examples of ineffective or inefficient communication:

If I had this to do over again, I would probably have interviewed the client myself even if I didn't live in Atlanta. One of our team members really wanted to go and interview him in person because he didn't feel comfortable with me doing it over Skype. In the long run that has just created communication problems with the team. He contacts the client often without consulting the team which has not worked out well.

We have had some trouble coordinating schedules and different members are on-line much more than others so getting consensus on any issue takes a while - too long for a true evaluation team.

Would like our team to work a little bit faster and be more proactive.

More coordination and communication with each other. Perhaps a daily login and comment, even just to say I looked at the current material and have no comments at this time.

Greater access and faster turnaround time.

Improved response time (or responses at all).

More communication can be done by a particular member to ensure greater group activity.

Seven students explicitly stated communication and collaboration related concerns or problems in interviews as well:

[Tate] hasn't done things to connect to client. So according to his work, we follow our assignments. Our team decided to one person because our client prefer from communicating just one person. So we assigned him.  
(Sheri's response in the second interview)

She didn't send a reminder to me to complete it and I needed these by when.  
(Sheri's comment in the third interview)

I'm not sure if the team communication really had helped me or not. So I'm not sure about that. Yea I think that's a challenge. (Jane's response in the third interview)

My team is less successful because the team members are not working well together.  
(Sheri's response in the third interview)

It was tough just not well the content wasn't hard the collaboration was hard. It's hard to do that long distance but I mean it worked out great. It was just a challenge.  
(Katie's response in the third interview)

I've had a little bit of challenge with one of my team members and I don't think he's always been completely happy with me. And sometimes that kind of bothers me.  
(Katie's response in the second interview)

Katie is her name. In fact she said the other day "Why don't you do the leadership?" cause I tend to be very strong and so I'm kind of regretting that now. If I'm in the lead I'm more effective cause I have that pressure to do those things. Whereas I'm not I can fall behind and I'm that way in everything. I was mountain biking with my good friend yesterday and I was kind of tired and so he goes ahead then I tend to ...but if I'm in front I go as fast as I can so if I'm not a leader I am not as effective so. That might be an issue for me. (Tate's response in the first interview)

I think finishing the project was more difficult because of the distributed natures. So we had two group members in different time zones at different schools different programs. So I think that made completing the project more difficult.  
(Tyson's response in the third interview)

Of course that went through kind of a roller coaster experience. I felt really bad first as when it was happening. Cause I didn't know how to stop it, and I felt guilty cause I stayed quiet. And then in terms of getting any work done it was true that there was no work being done by the other two team members. And so I was in a panic mode at the beginning because other people had already done so much and we had just one paragraph that we had agreed on in about two or three weeks. So I was kind of nervous very nervous about that. (Ally's response in the first interview)

Well, I think it's an old one— to communicating with one another, you know, getting quick communication back and forth from group members.  
(Gary's response in the second interview)

The reasons that collaboration can be difficult are complex. In this course, the students alluded to four types of problems that led to challenging collaboration situations: unbalanced contribution, differences in expectations about learning and in the students' levels of engagement with content learning, personality clashes, and preference for individual work. First, all the groups had the issue of unbalanced contributions from the group members for various reasons:

I hope that some of the techniques for setting up milestones and responsibility will get some team members to contribute. (Anonymous comment from the Mid-term Evaluation)

I don't know what could be done to get this team to work together. I am spending a lot of time dealing with "group dynamics" issues instead of productivity. UGH. I have a funny feeling two team members are going to do the work and the others will just complain about everything. I was hoping this would have been resolved by now. Very frustrating.  
(Anonymous comment from the Mid-term Evaluation)

Well to work with a group within a course you have to ...improve hold that everyone that contributes. And the contribution levels can be different, the facilitator's moods can be different, so you have different perspectives and different personalities to deal with. But it is not... I mean that's how the world is. The world is never one type of person or just you know particular kind of motivation. And group work can either help and facilitate what you want or it can get very upsetting on the other hand.  
(Cindy's response in the second interview)

Yea, I said that in there earlier but I feel I am the least worker in my group because of the language and the degree. But yea I think I am doing a little bit yea little work than the others. (Jane's response in the second interview)

Cause we kind of get lost it's such a long period of time. There kind of some lulls in it and you know there are definitely people riding the coat tails of others. Not that they are bad people but just for whatever reason. (Tate's response in the second interview)

New challenges in that we had some instances we haven't fulfilled the responsibilities that they have been given. Like as in the time that the student didn't hand in her paper on time. (Gary's response in the second interview)

Really the biggest challenge is just of course working with the group and trying to get everyone moving and dealing with other personalities. One of my biggest concerns is I have one group member that I just don't know how to get her involved more. And that's probably one of my biggest concerns— I don't want to leave someone out and I want to be able to allow everyone to do everything that they can. So that's a concern. (Katie's response in the second interview)

Second, there were many differences in expectations about learning as well as in the students' levels in learning about the content. This problem was most apparent in Mia's and Tate's groups. Both Mia and Tate had very high expectation about this evaluation learning experience, and both had many deep thoughts about this topic. Mia was interested in doing some evaluation related activities for work, which made her already high expectations for herself and for her learning even higher. Tate's many years of work experience as a school teacher ignited his natural and innate interest in evaluation, making him particularly curious about many fundamental questions in this arena and encouraging him to aspire to really strengthen his evaluation skills. However, two Master's students in Mia's original group did not share the same level of expectations as Mia and became resistant to her leadership. The group conflict was later resolved by splitting the 4-person group into two pairs— Mia and Ally in one pair and the other two in another pair. In Tate's group, his expectation about how a really good evaluation should be done was inevitably higher than the rest of his group members. This made him very disappointed by two things: 1) the "cooperative rather than collaborative" nature of their group work, and 2) little effort in customizing their evaluation model, tools, and instruments and thus the creation of a "wholesale copy." Thinking he had "no control over that," Tate acted passively and more or less gave up on being a communicative group member regardless of his role of

being the only contact person with the client. In Katie's eyes, Tate was unwilling to work with the group, and he made it a challenge to "get everyone on the same page."

Another type of challenging difference concerned the students' levels in content learning and in engagement. Cindy and Mia described these discrepancies in the following terms:

I wouldn't call it an obstacle. I would call it a learning curve. It's when you are with other team members who don't have the same experience in a learning environment. So the perceptions in terms of group work may tend to differ. And as a result, some people will be ahead, some people will be in the middle, some people will be behind catching up. So the only thing I would say in group work and online learning is the mixture of experts with novices. That could be tricky. (Cindy's response in the first interview)

When you are extremely enthusiastic about something and about learning you, you know you completely engage with it. And you want to ask meaningful questions and when you see other people learning at their level, which may be cognitive level, or participatory level, motivation level...it's sometimes hard when you don't see others as engaged as you are. (Mia's response in the first interview)

Third, a clash of personalities was observed in two groups. In addition to the expectation difference found in Tate's group, Tate had issues with Katie and the negative feelings almost rose to a point near "explosion" in two instances. Both people felt hurt by the conflicts. It took Tate some time to "recover" and go back to his normal group activities, but he never seemed to regain his momentum. Katie was the group leader and though she felt she must continue to fulfill her responsibility, she no longer put her "whole heart" into it. The personality issue was not as bad in Tyson's group when he did not appreciate Cindy's "very powerful personality" as well as her "pushing her opinion a little bit too strongly." Being a little aloof from the beginning, Tyson tried to emotionally keep more distant from the group work after Cindy played down his points in small group discussions and after he figured out his position in the team.

Last, Sheri and Tyson indicated their preference for working alone, which might not have really affected the group work but still shed some light on why and how there could be a difference in quality of collaboration. Specifically, Sheri disliked not having the full ownership

of the tasks in a course that involved groups. Tyson described himself as “introverted” and “don’t like working as a group,” although he thought he knew “how to work as a group.” He also had a somewhat negative generalization of group work by saying that “no group project is going to make me like working as a group.” Therefore, he did not really “feel like I have anything to learn there.”

*Time related challenge.* One aspect of the time challenge pertained to the artificialness of the evaluation project timeline. As Karol said, “It’s a real evaluation in a real world setting with an artificial timeline.” The authentic project presented the challenges that usually occur in reality, but the university semester calendar did not allow the time for conducting a real evaluation naturally. This problem was particularly serious in Ally and Mia’s project not only because the two of them actually took on the workload for four people but also because they set exceedingly high standards for themselves in doing a strong evaluation. The final report was beyond their client’s expectation, but Ally and Mia had to spend an enormous amount of extra time by sacrificing their winter break while working with considerable stress. Moreover, the “big time crunch” during the final phase did not allow much chance for them to work together on data analysis, and thus the collaboration part ended unsatisfactorily. A somewhat related time issue happened in Sheri, Katie, and Tate’s group but surfaced in a different way when the members had different views about deadlines. Tate was more interested in doing the right things whereas Katie and Sheri was more concerned about getting the project done in time. Therefore, time was also a contributing factor to the struggles in this group. Finally, except for Ally and Mia, the other groups managed to submit their final evaluation reports before the semester was over by doing the best they could do within the limited time period. However, they might not have completed the project to the extent that they desired.

The other aspect of the time challenge centered on time management. Even though all the students but Carrie were full time students, they still had many responsibilities in their other studies and their part time university jobs. Juggling the things they were doing for school and life was not easy. Sheri, Jane, and Ally reported not being able to keep up with the course readings, including those for the evaluation project, because of the workload in their other courses. Cindy, Karol, Gary, and Carrie also reported that time management was quite difficult, although they successfully fulfilled the course requirements. Specifically, Cindy said that she did not produce the best quality because of lack of time in the day for completing the assignments. Her lesson was to be realistic about her workload next semester. Karol wanted to do a better job pacing her work and not procrastinating on writing. Gary had young kids to spend some time with every day in addition to his doctoral study and assistantship work. Carrie got stressed out trying to complete course readings and online discussions during lunch break at work.

*Challenges concerning authentic projects.* At least three of the four groups represented in the study encountered project related challenges that could have happened in any real-life projects. During data collection, unexpected bad weather prohibited Cindy and Karol from collecting post-test data when the school was closed. Later, one teacher was uncooperative and did not implement the software being evaluated in her classroom. To make things worse, Karol and her collaborators found two issues with the software regarding translation language and stability. Tyson also came across a similar difficulty when he had trouble obtaining useful information from his client. Towards the end of the semester, Ally and Mia's client "disappeared" for some time due to an emergency. It was also difficult for Ally to get her experts to complete the expert review survey, and only five out of ten actually did it in the end. Although some difficult situations were caused by uncontrollable reasons, the students still

moved the projects forward to the best of their ability. For example, when Karol and colleagues found the CD they evaluated was only translated into Spanish, they tried to work with the client to translate it into more languages so that they could get feedback from learners speaking other languages. Through these experiences, the students learned to set realistic expectations when working on similar future projects as well as to cope with what they would be likely to face with flexibility and perseverance.

*Challenges in learning evaluation.* Gary, Mia, and Tate reported challenges in terms of learning about the evaluation content and its application in both their first and third interviews. To Gary, since he did not have much experience with evaluation, his big issue was to figure out the best way to properly apply the “rote knowledge” that he gained easily from the course to concrete evaluation scenarios. Mia shared the same opinion as Gary about knowledge application and thought her additional challenge was to learn quite a bit on her own in the course through research and study in an effort to take her learning to the level of her satisfaction. The challenge that Tate mentioned at the beginning of the semester concerned the extent to which his group could customize the given evaluation model to the relationship with the client and the content of the product being evaluated. At the time of the last interview, Tate was still “wrestling with the fundamental questions of evaluation” and felt “more confused than ever” because the questions became more complicated after he had really “looked into it.” These perceived challenges seemed indicative of the students’ levels of engagement with the evaluation subject as the three of them both reported the strongest interest in this area among all the learners this semester. Gary and Mia even clearly indicated the intention to pursue a future career that involves evaluation. Their struggles in grasping the gist of evaluation manifested in their serious cognitive efforts to realize personal growth in this field.

*Research Question 3: How do students use self-regulated processes and strategies in the course?*

The analysis of interview data indicated that the students' self-regulation was the outcome of an interaction between the course and themselves. Five students reported that they took a more active role in learning in this course than in their other courses. These students indicated that being online and the course characteristics were the main causes for such a difference. Six students felt more self-regulated in response to the course's higher demand for self-regulation for similar reasons. The group work and authentic tasks also influenced their use of specific self-regulatory processes and strategies. Table 4.19 presents the specific self-regulatory processes and strategies used by the students during the second course iteration.

Table 4.19

*Learner Role*

Five students believed they played a more active role in learning for this course. Gary, Carrie, and Tate thought this had much to do with the course characteristics including the authentic tasks and group work. Generally, the applied project made the learning much more relevant and meaningful and increased student responsibilities. More importantly, Gary emphasized that it involved active knowledge generation as opposed to passive information receiving as happened in his other courses. The group work element also enhanced individual students' accountability as they were not only responsible for their own learning but also had a direct or indirect influence on their group's learning outcome. The comments below illustrated these points:

We met as a group on every Monday. We had a conference. So for me it was the only way I was going to have contact with my group other than emails. So I had to be prepared for that. Whatever my tasks were for that week, to have done them and be prepared to talk about them and move on for the next week's assignment, whatever we were going to be doing.

And also keeping up with the readings because they applied so much to the project we were doing so you know if we hadn't all read the material we wouldn't be discussing the same things or understanding why we were going to do something.

(Carrie's response in the third interview)

In this class I feel like most of the responsibility was on myself for my learning because I had somebody besides just the teacher and the TAs who was wanting things from me. There is this client. I felt more like a consultant in a lot of ways rather than just a student just like a passive collector of knowledge. I felt like I had to actually create something and make sure that it was useful to a real client, somebody actually in the field. So that was a different role for me and because I was the team leader so that also kind of changed my role I had instead of just being responsible for my own learning and my own production, I had to be responsible for other people's learning production as well. I was responsible for other people's work as well to make sure that they did a good job.

I felt like not only in not only in learning the content because I had to apply what I was learning but also I felt like I was playing a more active role in the creation of this project, in the creating of the evaluation report. (Gary's response in the third interview)

Tate was special in that his level of activeness was correlated with his interest in the subject as well as his confidence in his ability for studying that subject:

That's the comparison I would use between stats and this. Stat I feel so unnatural, so out of my own context that I was a different student I was more...I had no confidence. I was passive because of a lack of confidence in that class definitely as opposed to this I was probably more active and because of confidence.

I have a Higher Ed course about strategy and management issues. Again pretty confident and pretty active, but I guess it's another issue. It's the desire I have for that I'd like to do evaluation as opposed to ...or other Higher Ed management. Of all my courses it was most personally interesting to me, what I'd like to do.

(Tate's response in the third interview)

Katie and Jane felt that they were more active for a different reason — studying online, which applied to their online courses in general. This was Katie's first 100% asynchronous course, which brought Katie a greater sense of responsibility because she was unable to get the daily or weekly help as easily as she could in a face-to-face course. Jane's motive to be more active came from the external reasons; she felt that in an online course she had to show the evidence for presence and participation by "writing something" whereas students could be

present but not actively participating in a face-to-face classroom. Tyson, however, perceived the difference as “more of a manager or more of a coordinator” but “less of a student.”

The other students did not report a difference in the degree of activeness of their role as a learner, leaving unanswered the question of whether that they were equally active or equally passive in this online course as they were in other courses. Mia demonstrated very strong autonomy in her own learning and exemplified exactly what the instructor would like to see from all his students. Mia’s comments in the third interview below perfectly explained how an ideal student should approach her own learning and take charge of it:

Because so much depends on our own initiative in learning and reaching out to outside sources to learn so I think I feel equally successful.

I don’t think the content is difficult. I think the field is in a state of flux and I think that because it’s in a state of flux. It isn’t quite sure how to handle some things. I think it just required us to think a little deeper but that’s what we’re supposed to do.

I don’t wait for a course to structure my learning I wait for a course to inform my learning to enlighten me to things I don’t think about but not how I approach learning.

### *Perceived Self-regulation*

The students’ responses for level of perceived self-regulation showed a similar pattern as that of the learner role. Six students found the course had a higher demand of self-regulation and reported their heightened self-regulation as a result. Four students perceived no discernible difference in self-regulation in this course as compared to their other courses. Two of these four students attributed this to their adequate prior experience with group projects or authentic tasks. There was one student, Ally, who felt less in control of her learning because of her reliance on her group members in completion of the big assignment.

Cindy, Jane, Karol and Tyson reported the same or similar levels of self-regulation in this course as in their other courses. Cindy described herself as “normally very self-regulated.” This

semester was more difficult for her because of her overall course load, which made her self-regulation more challenging. Her self-regulation was more focused on doing her work at her best times for quality—late at night and early in the morning. The online course was “a great fit” for Cindy with its flexibility that enabled her to make optimal time arrangements. The reason that Jane did not find her self-regulation was because “it depends on me” rather than the course. She did report an inconvenience that the readings were not offered in hard copies so that she had to read on the screen when she got busier later in the semester. She reported that this caused more difficulty for her, although why she did not print the readings was unclear. Katie’s and Tyson’s copious previous experience with group projects, online courses, and even authentic tasks had accustomed them to the type of tasks and learning in this evaluation course. Consequently, they regulated their learning as they had in earlier courses as Tyson indicated in the third interview:

I’m very use to doing that kind of thing. So I think that my work processes are already sort of oriented to working online. So I don’t think I really changed very much just for this project.

Ally felt less control over her own learning because the group project led to the loss of her independence in meeting some of the course requirements. For the same reason and additionally the online element as well as the clients involved in authentic tasks, several other students agreed with Ally that the course posed a higher demand for regulating their learning activities. Regarding the online aspect, the absence of regular face-to-face meetings made it easier to get by without fulfilling course requirements, such as completing readings and watching presentations. Like Carrie said, “If I don’t do the readings, nobody cares.” However, the online discussion and project did help Carrie to complete the course readings. Similarly, Sheri thought it easier to get by in an online course; to her, even the discussions did not accurately reflect the completion of readings and such. No matter what, Sheri and Carrie tried to regulate themselves

to be more to be responsible for their own learning. On the contrary, Tate was an example of “out of sight, out of mind,” and without the obligation to physically show up in a classroom, it was easy for him to procrastinate on his course duties all together, regardless of whether the tasks were individual assigned or for collaboration. According to Tate, his self-regulation overall was an issue with much variation for different weeks. Therefore, he admitted being less self-regulated in this course.

Like Ally, Katie and Gary felt they were controlled by external factors in many ways. Nevertheless, they made great efforts to regulate their study. In terms of her way of self-regulation, Katie tried to do the same as she did for other courses but was not always successful, since she had difficulty in getting hold of the client, “meeting” with group members and getting replies from them. She felt a little powerless when there was not much for her to do but wait. On the other hand, she felt an urge to stay on top of things because the larger project required “work all along” and she could not “procrastinate to the end.” To Gary, his leader role meant a responsibility to not only regulate his own learning but also help his group members to do so. Mia was as highly self-regulated as she would normally be. However, she had to be even more regulated when she had to spare a lot of extra time for the project and find a lot of additional resources within a very limited time frame in order to take her group project to a level of her satisfaction:

You constantly have to learn on the fly. That’s what makes you an expert, and that’s what makes you successful. Because reality is that you cannot define everything like a clean little experiment in a lab where you oversimplify things. Real life is composed of many variables that you know nothing about. And as you are doing your work, you discover them, and you have to adjust and adapt and find solutions.  
(Mia’s response in the third interview)

*Self-regulatory Processes and Strategies*

*Planning.* Much of the planning focused on making time arrangements for specific tasks. Calendar was a commonly used tool for organizing activities, as most students prioritized their work by deadlines for tasks. The other considerations for prioritizing included interest and challenge of the task. For example, Tate and Gary held this course very high on their priority list because evaluation was a personal interest of Gary and for Gary this was the only course he was taking within his major that semester. Conversely, Tony's focus in his doctoral program was not evaluation, which partially explained his less involved attitude. Karol, Gary and Mia also considered how difficult or time-consuming a specific task could be at time of planning. Karol was more used to starting with harder assignments, so she did not worry about them later while Gary usually approached the easier ones first.

The students also had different emphasis in term of time management. Cindy strived to work at her best study times in order to do quality work. Similarly, Katie saved her uninterrupted hours in the early morning and late at night for tasks that required more thinking, while she used the less productive hours during the day for meetings and other responsibilities. Carrie tried to fit her course work into her full time work schedule by doing some readings during lunch hour and sparing some hours in the evening for the rest of her tasks. In this way, she managed to make steady progress each week. A strategy that Carrie, Ally and Mia used was to scan all the work to get the "big picture" at the beginning of a week and then budget their time during that week accordingly. For some other students, for example Sheri, time management was more about getting the work done by deadlines.

Since the collaborative evaluation project was the central course task, planning by the group as a whole was more obvious in the course when the members got together regularly at

group meetings. The team made decisions about every aspect of the project, ranging from project objectives to division of work. In this process, Karol used a computer program to assist her in planning the project by breaking it down into smaller tasks.

Early in the semester before the evaluation projects started, the students usually followed a certain order when they worked on the course tasks. They normally went down the tasks as listed in the course weekly outline, proceeding from the readings to the PowerPoint presentations and then to the online discussions, but occasionally there were some minor deviations. For example, Gary jumped in to view the presentation first if that was “about something that I’m really interested in or I know that I’m going to be doing that thing soon.”

The introduction of evaluation projects changed the students’ work pattern, their way of prioritizing, as well as time management as they tended to give the group project higher priority. In other words, the students chose to work on group matters and the project task first and then took care of their regular work assignment such as readings and discussions. As the addition of project work demanded more of the students’ time, they prioritized more than they previously did. Some spent more time on the course to cover the overall increase in work load, and the others just changed the allocation of time by shifting some of their time on the readings and discussions to the project. In general, the students tried to save some time by spending less time on regular course tasks. Two main strategies in this regard were scanning when reading and reading the discussion question first. The total hours the students spent on the course showed a very large variation, ranging from 3 hours each week to more than 20 hours per week. Ally and Mia were undoubtedly at the higher end. Ally made it by cutting back on her other activities significantly including her original weekly visit to family in a nearby town.

*Monitoring.* Most of the students monitored their learning activities at both the group and individual levels. Group collaboration influenced the students' ways of monitoring significantly. Even for Carrie who did not consciously monitor her study process, she did something to ensure her contribution to the group project. A big part of group project monitoring was realized through the group meetings. All the groups set a timeline that helped breakdown the overall project in smaller chunks and so the students could meet the smaller milestones as steps toward the course imposed deadlines. Some groups were successful in following their internal deadlines, but some did not always make them. In several instances when these groups fell through on the course deadlines, the instructor urged them to work harder. Through individual efforts in group work monitoring, the students ensured their part of the work was completed with both quantity and quality by the time of each group meeting. In addition, some students applied their own approaches. Tyson used group feedback for his work as part of his monitoring. Ally and Mia talked virtually every day about their project. A project checklist and the instructor provided rubrics were also tools for Ally. The instructor's update for the whole class regarding the groups' progress really helped Katie to understand where her group needed to be. In Gary's group, every member served as a check person for each other. Throughout the collaboration process, Gary tried to make sure everyone did what they were supposed to do. He also acted promptly when a problem surfaced and took over that part of the task so that the overall project was not hindered too much. At his group meetings, the members tried to answer these questions about progress: "Where are we? What do we need to be doing now? And where we need to be? Where should we be by now?"

For monitoring individual learning progress, six students mentioned the use of some sort of checklists. Except Tate who did it mentally, Ally, Cindy, Gary, Jane, and Sheri either created

a checklist for themselves or used the Moodle course weekly outline as a checklist. Cindy's checklist was special in that it was composed of the things she wanted to learn instead of weekly activities to be fulfilled like those of most other people. Gary used both his own to-do list and the itemized course outline for monitoring. He even viewed the overall course outline presented in Moodle as a big checklist for the whole semester. Additionally, to monitor his individual learning, he asked himself similar questions as those being asked at his team meetings. Furthermore, one more strategy of his was to revisit certain course materials when it came to actual application of that part of knowledge.

Some students used other strategies for monitoring. For example, Jane, Tate, Katie used the discussion postings of other classmates as a way to understand where their peers were; Ally wrote herself notes in addition to using a to-do list as well as checked her email and the course website for updates and new materials every day; Mia monitored herself by first having a big picture, finding out the needed pieces, using each minute well and then putting all those little pieces together. Carrie was not aware of any monitoring activity on her own. In a sense, her checking of her periodic progress was a by-product of her group monitoring process.

*Self-reflection and self-evaluation.* Except for Ally, Mia, Gary and Katie, reflection was not prevalent among most students in the course. They either did not think about their learning much, or like Cindy said, "did not do [it] overtly." Carrie, Jane, and Sheri thought about their performances only when they had to—the times of quizzes in Carrie's case, the end of semester for Jane, and when Sheri had an assignment or questions. Carrie also wondered about not getting responses for her postings in discussion forums. Tyson's reflection mostly happened when he was producing something, typically writing, and he thought about whether his work was good enough to meet the instructor's requirements. According to Tate, his reflection "came and went

like my motivation.” He admitted not being reflective throughout the project process but the interviews prompted him to think more. Ally, Mia, Gary and Katie were much more reflective due to their deep cognitive involvement in the projects. Ally thought about her work all the time not only because she had been continuously and intensively working on the evaluation project but also because her personal relationship with the client and thus her strong desire to do a great job. Highly self-regulated and thoughtful, it was no surprise that Mia reported she “constantly assess[ed] my performance cause it goes hand in hand with learning.” Moreover, Mia had very deep thoughts about learning:

And performance for me is not for example, answering the questions in the course. Performance for me is even inside. Inside into what something means.

Gary reflected on many things about the project, including his performance as a leader and as a learner. Katie’ biggest question was “what do I know and what I don’t know yet that I would need to know to be able to do this in the real world.” She thought she was very “different” by the end of the semester.

Reflection and self-evaluation are closely associated yet somewhat different. Overall, self-evaluation was not an overt process for most of the students. When they were prompted to think about how they gauged their learning during the final interview, the students recalled four types of strategies: application of knowledge in evaluation projects, online discussions, feedback from peers and instructor, and quizzes. Six students viewed their group evaluation projects as the best test of what they had learned. For example, Ally always asked herself whether she could use her skills at job interviews. Katie evaluated herself by how she could use her learning not only for this project but also the projects in her other courses. Some students also gauged their understanding of concepts by comparing their thoughts with their peers as reflected in the online

discussions. Five students indicated the importance of feedback from team members and the instructor for their products. Cindy gave an example of how her colleagues helped:

That's where my colleagues came in because any time I had a question, I was like "Why did I not see this or why am I seeing this differently from everyone else?" And I asked them, and they would help me to see it their way or confirm that they saw it too. So that's how it worked on us. (Cindy's response in the third interview)

The students had divergent views about quizzes. Five students thought the quizzes positively helped them monitor their learning of content while Tyson, Carrie and Katie did not think them necessary. Tyson and Carrie both thought the quizzes as a kind of "bother" because they took time from their project work. Tyson further contended that at the graduate level discussion and project would be a better and adequate measure of learning and quizzes did not help retention and transfer of knowledge in the long run. Finally Tyson even concluded that:

I don't really feel like I'm looking for some kind of external validation of my amount of learning. It's mainly internal. (Tyson's response in the third interview)

In contrast, Tate believed the quizzes helped him test his grasp of the content and identify the gaps. Cindy on one hand admitted the utility of the quizzes for assessing content learning and on the other hand, pointed out the negative connotation associated with quizzes because of their rigidity in her culture.

*Resource finding and help seeking.* The students in this iteration had a similar pattern with their first iteration counterparts regarding resource finding and help seeking. Since the instructor provided plenty of resources within the course, the majority of the students primarily used these resources. Four students, including Karol, Mia, Sheri and Katie, searched for additional materials on the Internet to various extents. Katie and Sheri worked in the same group and thus both reported occasional use of the Internet for useful information for their project. Karol's proportion of independent research and her use of existing resources were about "half

and half.” Mia did extensive research on her own through general and specific Internet searches as well as library database searches in addition to careful examination of the instructor provided links. She even made extra effort in using the references from the course readings. Most impressively, she spent a lot of time learning a piece of software for usability testing in order to enhance the quality of her group evaluation project.

As manifested in this course, help seeking and resource finding were closely interrelated, since many times the students contacted the instructor or other people they knew for resources and information. Several students sought additional resources through the instructor. For example, when he could not find an answer in the course materials, Gary contacted the instructor for questions about the project, such as “What is a good number for interviewees?” For another example, Mia asked the instructor for an evaluation report sample or template. At other times, some students asked the instructor questions for clarification on tasks or course materials.

One aspect of help seeking that resource finding did not encompass, however, was getting assistance for resolving issues about group collaboration, logistics, and projects. For this, the students generally looked to the instructor or his assistants to intercede. Among others, the instructor intervened in Mia and Ally’s early group situation and approved its division into two separate groups and assigned the new group a separate evaluation project. Tate also came to the instructor with his grievance about his group leader. Mia informed the instructor about her technical difficulties with Moodle discussions. With the instructor’s help Katie’s group found experts as part of their data sources. They also got other assistance with instrumentation. Gary approached the instructor for specifics about doing a usability test for his client and borrowed the instructor’s usability equipment. It was typical that the group leaders reached out on behalf of their groups, although some other members on the same campus sometimes also contacted the

instructor because of their easy access. However, for some students, it was just not easy to ask instructor for anything. Even Gary, a host institution student and a team leader, regretted having waiting too long to contact the instructor. He admitted that “you always have that fear of the first time contacting somebody whether they will be just really rude to you or they won’t.” But after the first satisfactory interaction, he realized that the instructor was so knowledgeable and helpful, Gary “learned to do that quicker.” In hindsight, Jane said she should have sought help from the instructor. Similarly, Sheri blamed herself for never asking for help.

It should be noted that like students in the previous iteration, the students also took advantage of the knowledge and expertise from people around them. For instance, Ally got help from Mia’s husband and the technology support people at the client’s institution for the online survey. Cindy “drew from everything I can touch,” including professors in both her degree program and those from the place of her assistantship work. There was also a lot of talk about the course within groups and within students from the same institutions. Generally, the students first turned to their group when they needed anything.

*Research Question 4: What support can be built in this learning environment to promote students’ self-regulated learning?*

Based on the findings from the three student interviews, instructor interview, mid-term evaluation and final course evaluation, supports for the students’ self-regulated learning are needed in the following aspects as summarized in Table 4.20: 1) provide more guidance for group work, 2) guide and moderate online discussions, 3) assist students in time management by emphasizing deadlines, introducing interim deadlines and advising how to pace important work, 4) provide assessment at appropriate intervals and with a consistent challenge level, 5) assist students in monitoring through weekly reminders and frequent check-ins and updates, 6)

sequence course content and activities to match project progress, 7) offer more work examples earlier and encourage students to use provided resources, and 8) proactively reach out to individual students.

Table 4.20

*Provide more guidance for group work.* The students' collaboration processes as well as their end-of-semester feedback suggested a need for more specific guidance for effective group work. Since group work was such a big part of their learning experience, its success or failure directly affected their motivation and in some ways their individual learning outcomes. To assist their learning, facilitation of the group collaboration was one of the most important aspects. The course can work on at least three things for improvement in this regard.

First, as Tate and Mia—the two students who experienced the most serious group problems—both pointed out, a course involving collaboration has the responsibility to help students gain a shared understanding of real collaboration at the very beginning. Many of the group issues this semester arose from differences in expectations about learning experiences, quality of deliverables, and communication within the group as well as with the client. It will be helpful if students are prepared through sharing of common collaboration challenges, guidelines or principles of collaboration, and specific strategies to work in a group. It is also critical for them to realize the importance of reconciling expectations.

Second, an effective way to smooth group communication and collaboration is to help the members to get to know each other as individuals when they first come together. Although the first week started with an icebreaking activity that had the students, the instructor, and the course facilitators introduce themselves in an interesting way, this seemed far from enough for helping people to become familiar with each other. In order to create a personal feel and close the

psychological distances due to geographic locations, students should be encouraged to see each other “face to face” with the assistance of technology such as Skype at least for the initial meeting. A few students and even the instructor expressed their hope for either seeing people or knowing people better at different points in the course:

[Answer to the question about the worst part of the course] Not seeing our teammates face? :) (Anonymous response in the Course Evaluation)

I think it would have been helpful to know more about everyone from the beginning. Maybe having everyone post a page about themselves, their experience, and where they were in school. I know everyone posted a little bit, but it would have been helpful to have more. (Anonymous response in the Course Evaluation)

I will say one more thing this is having done these I think that the ice breaking or community building should have been done more extensively. (Tate’s response in the first interview)

To get to know people better. (Instructor’s response in the end-of-semester interview)  
I had it to do over again, the very first thing I would do is really try and get to know my team members right from the beginning. : I think that would have helped in our communication. You know understanding what their skills are, even what they like, where they are in their lives, I mean do they have families, are they just graduating, you know, where are they. I think that really would have helped us in the very beginning as we were trying to get to know each other and work together  
(Katie’s response in the third interview)

I would have liked to have the ability to be in the course using probably video. I think there is a social aspect with online that needs to be taken care of to help promote the course and the content. (Cindy’s response in the third interview)

I’m just thinking maybe that’s an advantage of a face to face thing is that you can grab somebody after class and discuss something. (Carrie’s response in the third interview)

Third, regular group meetings were crucial for group communication and collaboration and thus should be enforced more strictly. Some groups managed to meet on a regular basis, for example, every week, but some did not do that well in bringing people together for discussions due to scheduling and other reasons. One anonymous comment in the Course Evaluation stated:

Please try to often communicate with other team members. Set a static time schedule for team meeting at the beginning of semester.

This importance was also made obvious in Sheri's response in her last interview when she explained what they did at the meetings:

That time for meeting for team meeting, regular team meeting because it is very important. Everyone has their schedule. So before the meeting, one goal is we need to set up committee. So I think if we set a regular meeting every week, it is help us to communicate with others and to review what we needed for the week.

*Guide and moderate online discussions.* The findings about online discussions' impact on the students' learning show that the students need guidance to create substantial learning in an open yet non-threatening atmosphere. The issues identified in this semester's online discussions mostly came from differences in expressing disagreement, making more direct, relevant responses to others' postings, and procrastinating after initial postings, indicating an absence of explicit instructions on how to conduct effective online discussions. Thus, clear online discussion guidelines should be in place. First, respect for each other needs to be emphasized, which does not necessarily mean discouraging different voices. Instead, the students should be advised about how to express different opinions in a constructive and professional manner. Karol and Tate made specific comments about these two aspects respectively:

I think probably I mean in general by creating a good environment involves creating a good atmosphere so that people feel safe and can voice their opinions, creating a respectful atmosphere so people aren't rude, which I mean usually doesn't happen in college but sometimes does. I think having a space that is useable and user friendly and intuitive is good. (Karol's response in the third interview)

"Ok we're online. Let's accept it there has to be a new culture because of it." So you talk about it that. You can disagree with ideas without disagreeing with the person and that's a part of the process. (Tate's response in the third interview)

Second, the fact that most of the discussions happened towards the end of the week indicated a need for a deadline for initial postings to allow adequate time for follow-up discussions and deeper intellectual interactions. To this end, postings lacking substance or that merely show agreements should be discouraged:

Treat this course as you would a F2F course - that is - block time out early in the week to read and make the initial posting to the forum.

(Anonymous response in Course Evaluation)

Maybe a deadline as to when to post your first things, your first message would have helped a lot of people regulate but then a lot of people just posted I agree. That was great. You know so maybe more guidelines and the content of the posting and a more of a deadline to post by your first one by. (Cindy's response in the third interview)

I think that they should definitely reply to the posting on the forum by Tuesday. So have that as a to-do on their list. (Tate's response in the third interview)

Third, the instructor intentionally let the students discuss free of his interference this semester and sent out a summary of discussion at the beginning of the following week. Although there are both pros and cons for this practice, many students preferred to have the instructor provide feedback to postings, redirect some conversations, or intervene at times of issues during the week:

Provide feedback about discussion posting or other activities so far.

(Anonymous response in the Mid-term Evaluation)

I probably would like to see more questions posed, or challenges raised to students' responses in the weekly main discussion. Not that i would want him too involved, then it would take away responsibility from the students to challenge each other.

(Anonymous response in the Mid-term Evaluation)

More comments on our responses to questions but understandably, this requires a lot of time. (Anonymous response in the Mid-term Evaluation)

The professor has a role in directing the flow of the conversation - asking follow-up questions and guiding participants to important points.

(Anonymous response in the final Course Evaluation)

[Instructor name] should be a moderator on more discussions. There were several times I felt that people were not respectful toward what I posted.

(Anonymous response in the final Course Evaluation)

I think the discussion board needed to be monitored. I was surprised by a few of the student's confrontational attitude. I think that the attitude reduced the quality of the discussion postings of the other class members. I know that there were times I didn't express my opinion because I didn't want to receive a rebuff.

(Anonymous response in the final Course Evaluation)

Some of the others also didn't get any like opinions from their opinions in the discussion board. And it would be good if everyone has that kind of feedbacks about their opinion. (Jane's response in the third interview)

However, there were also two votes for no instructor moderation from the Course Evaluation. One student feared that the instructor participation "might limit the response to what would be considered as the correct or preferred answers." The other positive respondent felt satisfied about what the instructor did this time because it was interesting to see people's very different thoughts and approaches for each discussion question. In addition, this student felt the overall instructor feedback at the end was adequate in terms of sharing the instructor's approach and providing a point of comparison. Yet, one student took a neutral stance and two others advocated limited instructor participation where the instructor might respond to postings needing "a higher level of thought" to maintain students' interest and stimulate their deeper thinking.

Finally, the instructor decided to take an active role for the third iteration. Regardless of the helpfulness of some deviant postings, the primary focus of the discussions should be to help students better conduct their evaluations. Therefore, to rectify the off-topic issue and better guide the project processes, the instructor planned to use practical topics that were relevant to what the students would be doing for their evaluation tasks.

*Assist students in time management.* Managing time for an evaluation project in flux while learning a lot of content about evaluation can be very challenging, especially in conjunction with the students' already full schedules. Effective time management plays a decisive role in meeting course requirements and learning substantially in this course. The fact that the course only imposed two deadlines for the evaluation plan and evaluation report respectively during a whole 16 week period made it difficult for the novice evaluators to pace their work. In this situation, the resultant rush later in the semester seemed unavoidable. The

lesson was that the course can provide more assistance by further enhancing its structure in terms of timeline in spite of the students' skills in organizing their studies and projects. The following student and instructor feedback provided implications about possible changes in launching projects and setting deadlines:

Definitely I want to provide more deadlines and hold to those deadlines.  
(Instructor's response in end of semester interview)

I think everything is going out smooth. It may be better to see general project timeline.  
(Anonymous response in the Mid-term Evaluation)

Start your project early on. (Anonymous response in the Final Evaluation)

Perhaps having real clients lined up earlier in the semester and although difficult without the knowledge, beginning the project a little earlier. (Anonymous response in the Final Evaluation)

Start the report early in the beginning, doing the introduction and stuff.  
(Ally's response in the third interview)

Remember at the beginning of the semester, we read chapters ...question and we waited for weeks before we met our client and started working with the clients. So I think that the beginning of the semester, client should have been introduced.

Thus, what could be done differently next time was to on the one hand, introduce clients and projects earlier in the semester, and, on the other hand, to set interim deadlines for the work on the two major deliverables, leading the students to take baby steps towards the final destination. For example, the instructor could suggest the students to complete the first few sections of the evaluation plan before they move to the middle and final stage of data collection and analysis. This would greatly alleviate the time pressure and hopefully improve the final product quality.

*Provide assessment at appropriate intervals and with consistent challenge level.* The added assessment opportunities, the quizzes in particular, proved beneficial for at least some students in terms of monitoring progress and gauging cognitive gains. Nevertheless, the three quizzes were all administered in the last few weeks due to logistic reasons (including a

Thanksgiving break) during this iteration, which added to time and workload related stress and probably missed optimal timing for assessment during the earlier part of semester, which definitely should be adjusted for the next offering. In other words, the quizzes needed to be arranged at more evenly spaced intervals.

This works well, although I think the quizzes should be spread out.  
(Anonymous response in Course Evaluation)

I want to divide quiz during the semester. (Sheri's response in the third interview)

One thing I probably should've introduced the quizzes earlier.  
(Instructor's comment in the final interview)

Another problem with the quizzes concerned inconsistent difficulty level and ways of submission. The first two quizzes were composed of multiple choice questions requiring mostly memorization of facts and a low level application of knowledge. The third quiz, however, consisted of scenario-based long answer questions, which required critical thinking, flexible application and synthesis of knowledge as well as analytical skills. While Tate obviously enjoyed the third quiz more, Sheri was unprepared, waited too long to take the quiz and did not do as well as in her previous two quizzes. Additionally, all the three quizzes were administered through the Moodle Quiz function, which worked fairly smoothly with the first two quizzes with multiple choice questions. However, the Moodle Quiz function proved difficult for the third one because it took much more time for students to think and compose answers. Although four students figured out how to save their answers and continue at a different time when they needed to finish a quiz in more than one sitting, the other students did not and instead emailed their answers to the instructor. Naturally, the instructor realized that future quizzes should be roughly equivalent in terms of challenge. In addition, he surmised that instead of letting students struggle with

unfamiliar Moodle Quiz functions, it would be better to have them submit quizzes with long answer questions via email.

*Sequence course content and activities to match project progress.* Another aspect of course design that could be improved was to organize course content and activities to approximately “synchronize” with evaluation project phases as Gary, Mia, and Katie commented below:

If there was a way to make a task match what we read that week...So for instance, if we are doing evaluation report this week, then that's when we read about the evaluation report in the book so that it's just in time information. Or if we are doing interviews this week or usability test this week, that's what we read about the week before or this week so that we're ready to go on those that kind of thing. So matching the task to the resource.

I think it takes more time to go back and read about it. But when you first read about it, you think “Well, I don't know whether this I'm really going to use in the project because I haven't talked to my client yet or whatever.” So if you read it while you're...you know you have to be doing it pretty soon then I think you pay a lot more attention.  
(Gary's response in the third interview)

We have the beginning weeks where we went week after week after week on chapters but we really weren't applying any of the knowledge. And I think that caused a lot of difficulties. Because I think that in sequencing it rather than making it parallel...in not applying you have time in which you forget material. And I think that was a unique demand of this course that if it had been organized and designed so that from the beginning it was applied then I think that we all would have been able to struggle a little less in putting things together ourselves.  
(Mia's response in the third interview)

I like the discussions. Sometimes I think for me it would have been valuable if we could have discussed more about what we learned that week.  
(Katie's response in the third interview)

There is no doubt that studying something while doing it or vice versa is ideal for acquiring and internalizing knowledge and skills. However, the differences in pacing of each project made it nearly impossible to realize accurate synchronization for every group. What the course could do was to match materials with project progress based on the instructor's proposed timeline,

although the specific interim deadlines were subject to change when various phases of evaluations actually took place.

*Offer more work examples and earlier and encourage students to use provided resources wisely.* Several students thought having example evaluation plans and example reports would be very helpful. In her last interview, Katie explained in detail why an example was important for her team to complete the deliverables:

I do think it is of value to have some examples of each process so that the evaluation plan to have some examples. I know it's hard for an instructor to give the students examples cause they are worried they will just copy them exactly. But when we first did our evaluation plan and sent it off to [instructor name], he was alike "No, you started it but this is not really what I want. Here's some examples." So once we have the examples, then we knew exactly what it was supposed to be. And same with the final one. I mean we sent it in, and he's like "No, this is not good. You totally missed the boat." And so we went out there and found some evaluations that [instructor name] had done— that were online somewhere— and just used those as examples to help us write the final one. And so I think that would have helped. To have those available and that way we could say "Ok, this is this is a sufficient quality. This is the right direction. These are the things that are included. This is the order. This is how it should look." I think those things I think that would have helped.

Actually, the instructor did have concerns about providing examples as Kristy suspected, but he still provided an example report later in the semester. For better use of examples, however, they should probably be provided earlier and with some explanations about how to use them wisely—in a way that provides scaffolds but does not confine thinking.

In the meantime, it would be equally important to encourage the students to make good use of the provided resources and tools as the instructor found evidence from the students' deliverables this semester that many of these materials were not carefully digested and applied. To have resources and to take advantage of what's provided are two different matters. Clarifications and expectations about resources use would need to be emphasized.

*Assist students in monitoring through weekly reminders and frequent check-ins and updates.* As discussed previously in students' monitoring as part of their self-regulation, a large portion of monitoring happened in the form of tracking project progress as a group. Monitoring of individuals was less apparent and was even neglected in some students' cases (for example, Tate and Sheri) either because of the students' forgetfulness or because they were too busy.

I would tell future students that though it is tempting to put off the readings, it's best to do it on the assigned week, as it is directly related to other things needed that week and also alleviates the stress of having to make up readings on another day.  
(Anonymous response from the final Course Evaluation)

Weekly reminders about study and project tasks would be helpful for student to complete all the tasks. The researcher also hoped, through this practice, to model active monitoring and hopefully gradually cultivate stronger self-monitoring habits within the students.

On the other hand, there were often group situations or project bottlenecks that needed immediate attention from the instructor but remained undiscovered until much later because the students did not share that information if they were not asked. One anonymous comment in the final Course Evaluation says: "I think this worked most weeks, but there were incidents where his intervention may have helped to keep us on track." Therefore, frequent check-ins with the groups and updates about projects would likely solicit more timely information in case assistance is needed.

*Reach out to individual students.* Although the students were always encouraged to ask the instructor for help, there was often reluctance to do so for different reasons. In one case, a student was simply being considerate and not wanting to bother the busy instructor too much. In another case, a student hoped for interactions but did not seem to know how that could happen:

I know that [instructor name] would be available to me if I asked him. The biggest problem that I have is that I know he is very busy and because I have never met him, I

don't quite feel comfortable just emailing him. This is just a personal problem of mine. I know he would be perfectly happy to help me in any way.  
(Anonymous response in the Mid-term Evaluation)

This is my first asynchronous class. I don't feel like there is a direct interaction between the instructor and myself. (Anonymous response in the Mid-term Evaluation)

These responses implied that if the authority figure did not break the ice and take the first step, the interaction flow just did not start. In the future, when time permits, it would be better for the course instructor and the facilitators to go beyond verbal encouragement to reach out to students by initiating meetings on the phone, via Skype or some other synchronous chatting program, or even face to face if the students are on the same campus.

#### *Refined Design Principles and Implementation Strategies after Second Iteration*

This section discusses the refined design principles and associated course design and implementation strategies based on the findings from the first and second iteration of the course. Table 4.21 presents a summary of these principles and strategies that work together to strengthen the motivational, cognitive, and metacognitive aspects of student learning in this course.

Table 4.21

*Design Principle 1: Engage students with relevant and meaningful learning tasks.* Self-regulated learning has a strong relationship with positive motivational beliefs (Pintrich, 2004; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Recent research also confirmed the correlations between motivation and self-regulatory strategy use in online environments (Artino, 2008). Perceived control and intrinsic motivation are critical for use of self-regulatory strategies (Eshel & Kohavi, 2003; Vollmeyer & Rheinberg, 2006). It has also been found that intrinsic motivation is negatively correlated with academic procrastination of online graduate students (Rakes & Dunn, 2010). One consideration in designing learning tasks should be their relevancy and meaning to students so that these learning tasks can arouse interest within students and

engage them through provision of choices in making specific learning arrangements. Authentic tasks are more likely to engage students with their real-life relevance and opportunities for problem-solving, representing diverse perspectives and reflecting (Herrington, Reeves, & Oliver, 2010). In the case of teaching evaluation, authentic tasks are most appropriate because of the innate connections between the authentic projects and conceptual learning from course materials.

In this regard, the main design strategy utilized in this course was to use authentic evaluation projects as the overarching learning task. However, the task relevance still needed to be clarified at the very beginning because although the connections were apparent to some students, some others with little or no work experience might not see the relevancy as easily. Another aspect associated with the use of authentic tasks was to design other course activities grounded in this central task to enhance students' conceptual learning and to encourage them to directly apply knowledge and skills in actual evaluation situations. One specific strategy was to synchronize course materials and activities to match project progress as much as possible, although complete coincidence was almost impossible since each group proceeded at a different pace. It should also be made clear to the students that taking risks and making mistakes are part of studying a subject like evaluation, and the students should be encouraged to learn proactively through trial and error.

*Design Principle 2: Create a strong online presence.* Online interactions are an essential part of online courses. Further, teacher presence is critical because there is a strong relationship between students' cognitive presence and instructor presence (Garrison, Anderson, & Archer, 2000). The instructor him or herself should sustain a high level of participation himself if he expects satisfactory participation and engagement on the learners' part. Moreover, recent research on online SRL indicated positive relationships among social interactions, teaching

presence, learning presence, and self-regulatory strategy use (Baron, 2007; Ke, 2010; Shea & Bidjerano, 2010; Swan, 2004). Thus, online presence and social interactions of all class participants should be strengthened.

To this end, the instructor in this course made himself visible on the course website by making course announcements in course news forums, periodic responses on discussion boards, and weekly updates summarizing group project progress and online discussions. He also responded very quickly to individual student's questions and requests via email, normally within 24 hours. Course deliverables were turned around in a timely manner so that the groups could quickly continue their projects with constructive feedback. The instructor also shared his pictures and activities during his travels for conferences and other business at the course website. In addition, the ice-breaking activity that involved sharing of pictures and interesting personal information in the first week was very efficacious in helping people to know each other. Maximizing use of Moodle-provided tools within the course instead of sending private emails also contributed to greater transparency as well as visibility of instructor and students. There was also a need to create a discussion board for socialization purposes, which was called the "student lounge".

*Design Principle 3: Enhance course structure and guidance.* Evaluation is a challenging subject. To learn it well requires not only book knowledge but more importantly flexibility and savvy in appropriate application of knowledge, skills, tools, and techniques. The authentic learning tasks provided the students an opportunity to start developing these through solving open-ended problems. However, since this type of problem requires a higher level of critical thinking and self-regulatory strategy use, not all learners benefit equally from such tasks (Lodewyk, Winne, & Jamieson-Noel, 2009). Considering the students' novice status in this field,

more structure and guidance were necessary to scaffold the students through the authentic task completion. Additionally, the course structure was increased in some ways to reduce logistic concerns.

The specific strategies in this effort included: (1) communicate instructor commitment, outcomes, and work quality in course syllabus at beginning of semester as well as through online discussions, course announcements and weekly updates during the semester, (2) provide clear due dates for both individual assignments (mainly online discussion postings and quizzes) and group evaluation projects, (3) provide advice from previous students on how to succeed in the course at the course website, (4) provide general guidelines for authentic evaluation projects to the whole class, and (5) provide specific guidelines for specific group projects as needed.

*Design Principle 4: Enrich course materials and resources and communicate expectations about resource use.* Conducting real-life evaluations requires many resources. A single textbook is far from enough to help students build the knowledge base and skills sets they need to do evaluation projects with quality. Except for the basic theoretical knowledge, the students also needed practical information on a range of topics about evaluation planning, data collection and analysis, and valuation reporting. They also needed information related to their specific evaluation projects. Therefore, one important aspect of the course design involved providing enriched course materials and resources. On the other hand, the students would not be able to learn substantially and to conduct a trustworthy evaluation if they overly relied on existing resources and used them indiscriminately. Expectations about appropriate use of resources ought to be communicated early in the semester.

The course applied the following specific strategies regarding course materials and resources: (1) provide a variety of engaging study materials and resources that are relevant to the

course evaluation project, (2) make all course materials readily available and print-friendly for ease of organization and transformation as well as for convenience of current use and future reference, (3) encourage students to think critically and use the resources adaptively, (4) provide work examples early on to allow students enough time to think about how to adapt examples for their own use, and (5) encourage open resource sharing among students (for example, on class and group discussion boards).

*Design Principle 5: Improve communication and interactions at all levels.*

Communication is critical for distance courses due to student displacement and the amount of information to be exchanged. There could be more emphasis on effective communication as it was vital for successful completion of the collaborative, authentic evaluation projects.

Communication in this course occurs at several levels — between the instructor and the students, among the students as a whole class, among the students in a group, between the students and their clients, and between the instructor and the clients. Communication also partially affected online interactions, which in turn affected students' learning experience and self-regulation (Hill, Wiley, Nelson, & Han, 2004; Swan 2004). It was challenging to ensure effective communication at all these levels, but success of the course largely depended on it.

Many efforts were made in this aspect. First, at the time of course redesign, the instructor decided to limit enrollment to students located in North America to eliminate complications caused by excessive time zone differences. Second, the course design team provided immediate assistance when the students encountered technical issues. Third, the students were encouraged to use the Moodle course website as a centralized place for their course related activities to improve transparency and efficiency. The course offered an email feature, an online discussion subscription feature, group wikis, group discussion boards, and chat rooms. In particular, the

students were encouraged to share their evaluation plans and reports on group wikis. This, on one hand, supported collaborative editing with available tools and on the other hand, cultivated a culture of sharing and co-monitoring. Similarly, the instructor modeled the expected communication mode by trying to use the Moodle tools as much as possible when he communicated with the whole class. For evaluation project related communication, the instructor copied group members on most of his email correspondence with that group's client, demonstrating professional demeanor and quality in terms of communication. Additionally, he helped the groups sustain their communication with the clients when interventions were needed. Lastly, the students were encouraged to ask questions, share concerns, and seek help at all times (with the course instructor and facilitators/designers) via emails, drop-in visits, phone calls, Instant Messaging chat, etc. Furthermore, the instructor learned to go beyond verbal encouragement and reach out to students because it was just difficult for some students to initiate interactions with the instructor as an authority figure.

*Design Principle 6: Guide and moderate online discussions.* The findings indicated a need for the instructor to guide and moderate online discussions for several reasons. First, the instructor's presence on online discussion board was perceived as an indicator of student participation and insights being valued. Second, sometimes discussions went off topic. While some students enjoyed the extra information, some thought this was irrelevant and refrained from responding. In this situation, the discussion needed to be redirected and refocused. Third, occasionally there were "confrontational" moments when some students expressed disagreement inappropriately. At these times, instructor moderation would help to minimize the negative impact and restore student participation.

In terms of specific strategies for maintaining effective discussions, the instructor facilitated practical discussion topics that connect to the course evaluation projects. To allow time for continued and deeper discussion, the course should also set a deadline for initial postings. To assess discussion participation and quality, the instructor provided a rubric so that the students could learn how to be a better discussant. The discussion board should also cultivate an open but safe culture where students feel free to disagree yet in a respectful manner. The instructor needed to moderate online discussion intermittently to see how students were doing and if there was anything needing intervention.

*Design Principle 7: Assist students in planning and time management.* Planning and time management, important aspects of self-regulated learning, involve considering specific steps towards learning goals and allocation of time resource (cf., Zimmerman & Schunk, 2001). Planning and time management strategies have also proven beneficial in online courses (Hu & Gramling, 2009; Hsu, Ching, Mathews, & Carr-Chellman, 2009). To learn academically in a semester university course needs planning regarding fulfilling course duties and time allocation during regular weeks. To do a practical project with quality requires careful planning as well. With the demands from both content learning and authentic evaluation projects in this course, students' planning at a personal and group level could not be more important.

To assist the students in better planning for their study in the course, the instructor facilitated this process by emphasizing deadlines. To scaffold students' planning for evaluation projects, the instructor shared planning tips for conducting real-life evaluations in narrated PowerPoint presentations. To avoid procrastination or workload buildup due to poor planning for the evaluation projects, he also guided the students to set interim deadlines within the groups according to specific group project situations. In addition, advice on how to pace important work

for evaluation implementation and reporting were offered to the whole class and individual groups. Additionally, since the instructor travelled a lot during the semester, he listed all the travel dates and destinations on the course syllabus at the beginning of semester. The students were also informed of an estimation of the extra time in email correspondence during travel. By doing so, he communicated his expectation for the students to handle absences and leaves in the same manner because of the interdependence within the various student groups.

*Design Principle 8: Assist students in monitoring.* Monitoring is another key aspect of self-regulated learning (cf., Zimmerman & Schunk, 2001). Students used monitoring strategies to succeed in online courses (Hsu et al., 2009). However, when the students failed to monitor their processes themselves, adoption of monitoring tools was really helpful to facilitate student learning in online environments (Park, 2003). The goal of the course was to help students successfully gain knowledge and skills related to evaluating instructional products. Thus, the instructor intended to assist them in every way he could no matter whether they needed assistance for active monitoring of learning process on their own part or if he needed to keep track of their progresses through external monitoring.

Therefore, the following specific strategies were applied to facilitate students' monitoring process: (1) encourage students to review course objectives and check their skills against the evaluation skills inventory towards the end of semester, (2) present weekly tasks in an outline format in Moodle, which served as a checklist for students to monitor weekly progress, (3) send email reminders containing weekly tasks in the middle of each week, (4) check-in frequently with groups about their projects so that questions, concerns, and issues could be addressed in time, (5) post weekly updates on group project status with a summary of online discussions in Moodle, (6) provide individualized and constructive feedback in a timely manner so that students

could use it to regulate their learning accordingly, (7) turn on the online discussion subscription feature to help students follow new postings with ease, and (8) encourage student use of technology-enhanced monitoring tools, such as programs for project and task management as well as web-based calendars.

*Design Principle 9: Provide guidance for group work and facilitate group collaboration.*

Effective group work is usually difficult to achieve. The authentic projects added to this difficulty as the communication with clients and evaluation implementation on site required much more coordination and management. Moreover, not all the students understood how to build positive group dynamics. Considering these factors, the course provided specific guidance to assist group members in selecting a group leader, reconciling expectations about collaboration and the evaluation project, and organizing regular group meetings. In terms of technology, the students were encouraged to take advantage of various collaborative tools inside and outside of Moodle, especially collaborative editing tools with record tracking functionality. Whenever group or project issues occurred, the instructor assisted in their resolutions at an early stage. Since group members were dependent upon each other in their collective effort to complete the evaluation projects, it was also recommended that they monitor each other's progress and seek help and resources within the groups through co-regulation.

*Design Principle 10: Provide ample opportunities for individual students to assess learning processes and gains.* Traditional assessment of learning focuses on measurement of learning outcomes using tests, exams, and assignments (Reeves, 2000b). It is cautioned, however, that solely relying on summative evaluation methods leads to neglect of many of the important aspects of online teaching and learning (Palloff & Pratt, 1999). Only assessing course deliverables, such as written exams and papers, undoubtedly gives an incomplete appraisal of

learner's learning efforts and gains. On the other hand, self-evaluation is an integral part of the learning process of self-regulated learners. Formative assessment and feedback can help students take control of their learning (Nicol & MacFarlane-Dick, 2006). Thus, formative evaluation of student performance was incorporated in online courses.

The inclusion of formative assessment was also meaningful in that it was conducive to maintaining a strong online presence of course participants. Because of the unique features of online education, the virtual classroom lacks presence and the kinds of interactions found in a physical classroom. Use of non-threatening assessment methods in the course, such as analyzing online discussions in terms of quantity and quality, providing feedback for student work in progress, and assessing students' contributions to group projects based on peer evaluation, helped students to participate in both individual and group learning activities continuously.

Assessment of authentic tasks emphasizes the meaningfulness of the assessment activities in its own right and their natural connections with what has been taught (Herrington, Reeves, & Oliver, 2010). The main assessment approach associated with the authentic tasks in this course was judging the final products' (the evaluation plan and final evaluation report) characteristics and usefulness. Actually, the students received direct feedback on how their evaluation plan worked when they implemented it on the evaluation site. Similarly, they had an estimate on their own in terms of how useful their evaluation recommendations made in the final report could be for their clients. In addition, the final feedback from the instructor provided a comparison of their self-evaluation and the teacher's evaluation of the eventual deliverables. In this sense, the assessment of the authentic tasks was conducive to student reflection and self-evaluation that are integral to self-regulated learning. Inclusion of grading rubrics was proven especially helpful for the students to assess their own performance before submitting their work to the instructor.

Last, the main evaluation projects that carried most of weight in terms of grading reflected the collaborative efforts of student groups. There was also a need for assessing individual student's learning. To this end, the course used three quizzes composed of scenario-based long answer questions at different points of the semester to assist the students in connecting the concepts they acquired from course content. Instead of testing the students' memorization of facts and definitions, the quizzes prompted the students to synthesize their knowledge and use critical thinking. The instructor's individualized feedback on these quiz questions helped the students to identify their cognitive gaps. The student feedback suggested that these quizzes would be most helpful when administered at appropriate intervals and with consistent challenge levels.

### **Discussion**

The results of the study further supported some of the existing understanding of self-regulation in general and some more recent findings about online self-regulation. In the meanwhile, the study yielded some specific insights into how an online learning environment can mediate learners' self-regulatory experiences. The following section presents a discussion of the study findings about students' self-regulated learning experiences in relation to the research questions: motivational aspect, course contextual factors, self-regulatory processes and strategies, and possible support from course design.

*Research Question 1. How is the motivational aspect of the students' self-regulated learning evident in this course?*

Overall, the students from both iterations had positive motivational beliefs about the course. The majority of the students had goals concerning learning and/or application of knowledge and skills. They also held high task values, believing in the course tasks' usefulness

for achieving their personal goals of application. Their self-efficacy was high in general but experienced some changes during the semester. Some students' general motivation also fluctuated throughout the course period as a result of influences from their group and task experiences, their personal lives, and technology difficulties. To address these motivational issues, some students actively use multiple self-regulatory strategies to regain their inner drives. The results largely confirmed previous research findings that the positive motivational beliefs help promote self-regulation (Artino, 2008; Artino & Stephens, 2006; Chang, 2005; Joo, Bong, & Choi, 2000; Pintrich, 2004; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991).

It is important to note two things. First, in real educational situations, some students' motivation or goals may not be described as intrinsic or extrinsic in a simplistic way. Sometimes both types of motivations coexist in one student as observed in this study. For example, many students with learning-oriented goals cared about meeting course requirements, which was their responsibility for being students. Another reason was that they did learn substantially in the process of meeting requirements. In this sense, the performance part of their goals was instrumental for achieving their learning goals. In a different situation, while a student's main goal could be to fulfill requirements, he/she was still interested in gaining something out the course since he already invested the time and energy. Therefore, it seems more accurate to say that some students' were more intrinsically driven than extrinsically motivated or vice versa.

Second, motivational beliefs, goal orientation in particular, were not the only predictor of self-regulation. This was observed from a few students in the study. One student (Laura) in the first iteration and three (Tyson, Sheri, and Jane) in the second iteration did report non-learning related reasons for taking the course — specifically the instructor's fame or fulfilling program requirements. However, this did not necessarily mean they were not active or self-regulated.

Instead, Laura demonstrated the most discipline, perseverance, inquisitiveness, and resourcefulness among all the students in that iteration, which suggested the pursuit of excellence as part of her beliefs. Tyson was another interesting example because he knew exactly what he wanted to get from this experience and did exactly what was needed to attain his personal goal, which was not learning the details of evaluation but collecting the resources and understanding how to find them. In this sense, he exemplified the profile of self-regulated learners, although he might not be the best student in this particular course. Tyson was an opposite example who appeared to have the strongest interest in the evaluation subject but turned out much less self-regulated than some other students who did not report the same level of motivation.

*Research Question 2: How does the environment affect students' self-regulated learning and what challenges do students encounter?*

The online course environment investigated in this study was unique in its use of authentic learning tasks and group work to teach evaluation. Not surprisingly, the students' self-regulated learning experiences were significantly influenced by these factors. As many other online courses, the nature of online communication also played a role in these learners' experience. Overall, the course characteristics demanded heightened self-regulation of students but in the meanwhile promoted their self-regulation in some ways.

Group collaboration impacted both students' motivation and their ways of learning in the course. The students reported stress, frustration, and motivation decrease caused by unpleasant group events or ineffective collaboration. They also lost full control of the central learning task — the evaluation project due to the interdependence among group members, which made them approach the project much differently from how they would if working alone. Of course, group work had its benefits as the students reported learning from diverse perspectives, expertise, and

the collaboration itself. Thus, self-regulation of learning in this course heavily involved the regulation of social interactions.

This study confirmed that authentic task mediated the students' learning by forcing them to take a much more active role than they did in more didactic classrooms (Herrington, Reeves, & Oliver, 2010). On one hand, the students were intrigued by the direct application of knowledge and skills from book learning. On the other hand, there were a lot of stress and challenges associated with the reality aspect of the projects. The students had to be flexible and resourceful to come up with solutions to various issues while keeping a strong momentum in implementing the evaluations.

The lack of adequate course structure during the first iteration increased the students' uncertainty and further influenced their planning and monitoring the already challenging evaluation project. An enhanced structure and more guidance for group work in the second iteration improved students' experiences substantially by helping them better focus on content learning and project application.

Technology was identified as a mediating element for online student experience many years ago (Hannafin & Land, 2000). After online learning has been around for over ten years, improving online students' experience with technology is no longer about developing their abilities to get around in the online environment as suggested in previous research (Song, 2005). Rather, it is more about how to take advantage of technology to facilitate learning. Although a few students in the first iteration were much hindered by limited Internet access, the second iteration students were less troubled by technical glitches. Instead, quite a few benefited from using technology as tools to organize and manage their studies.

*Research Question 3: How do students use self-regulated processes and strategies in the course?*

The results provided additional evidence about the online students' adaptive use of self-regulatory strategies that were first found with students in face to face classrooms (Whipp & Chiarelli, 2004). In addition to the motivational strategies as discussed earlier, the students in both iterations applied other strategies to cope with various challenges encountered in this evaluation course. The contextual factors, mainly authentic tasks and group work, greatly influenced students' self-regulatory processes and strategies. The numerous personal situations in the first iteration directed the students' self-regulatory efforts to overcome adverse circumstances in order to focus on the course work. The second iteration was much smoother and consequently, the students' self-regulation was more geared towards group collaboration and task completion.

The specific self-regulatory processes as depicted in Zimmerman's social cognitive model for SRL (Zimmerman, 2000) were observed from the students to various extents. Planning was most salient as the students thought about time allocation and management as well as steps and procedures for conducting and reporting an evaluation project. The group work strongly impacted the planning process when the members planned together as a whole. Individual planning occurred when it came to actual implementation of the planned project work and completion of regular weekly learning activities in the course. Monitoring was another important aspect observed among these students who used both group level strategies and individual strategies to ensure project and personal progress. Reflection that included self-reflection and self-evaluation was less prevalent, indicating some students' lack of self-awareness in this regard or its rarity due to heavy work load or absence of the need. However, there were also a few exceptional students who were highly reflective throughout their work process and shared many thoughts during the interviews. The students in both iterations had a similar pattern in help

seeking. Peers and people around them seemed more easily accessible sources of assistance, although they realized later that they should have asked the instructor for help sooner. The students in the two iterations were somewhat different in two self-regulation processes. First, because of fewer interruptions to their studies and their full time student status (except Carrie), the students in the second iteration made considerably less effort in environmental structuring. Second, since the instructor provided a lot more learning resources during the second semester, with few exceptions the students mostly relied on the existing resources and spent less time doing their own research.

*Research Question 4: What support can be built in this learning environment to promote students' self-regulated learning?*

The pedagogy of using authentic learning tasks and the collaborative nature of these tasks posed many challenges for students, especially those without much prior experience in this aspect. The online delivery of the course added to the difficulty as it was more difficult for communication and collaboration. The researchers learned through the two course iterations that to succeed in this kind of online environment, students needed support in online communication and collaboration, structure, monitoring, and content learning. The specific design principles and corresponding strategies can be found in Table 4.21.

First, facilitating online communication and collaboration required not merely support from the technical perspective and more importantly, specific guidance for effectively communicating and collaborating with the considerations of and online communication characteristics, group dynamics and collaboration requirements.

Second, a carefully designed course structure should on one hand, allow student choice in what, when, where and how to do with respect to the learning tasks (Turner, 1995; Perry,

Phillips, & Dowler, 2004). In other words, the course ought not to be overly structured to avoid stifling student autonomy, self-regulated thoughts and actions. On the other hand, the structure needed to be sufficient enough to help students understand the course objectives, the instructor's teaching approach and expectations, assessments as well as the logistics, which proved crucial for their planning and progress monitoring. There was a fine line between a lack of structure and too much structure. To arrive at a balanced point was not easy and required a good understanding of theory and practice as well as an ability to make timely adjustments in course design in response to student feedback.

Third, the journey to the end of an authentic project was both long and short: it might feel long for some because of lack of prior experience and thus not knowing how to approach and progress appropriately; it was short in the sense of completing a real-life evaluation within a university semester. Therefore, assistance in task monitoring to ensure that the students' time was well spent and the group and logistic issues were resolved promptly.

Last, evaluation is a challenging field. Learning about the content in books appeared easy but its application was not. A most effective avenue to really grasp it was through experiential learning. When authentic learning tasks were used to help students learn about evaluation, it was compelling to connect the course materials with the project experience in a meaningful and natural way. It should also be made clear to students that struggling was part of the learning experience; learning happened through taking risks and making mistakes. However, the key was to render the course a good environment for students to better control metacognitively while wrestling cognitively.

### **Implications for Research**

This study was an explorative effort in discovering how online learners regulate their study considering the contextual factors of a unique course environment and how their self-regulation could be supported in the same setting. The findings from 16 students from two semesters touched on many different aspects of SRL. However, a single study was limited in length and scope for understanding fully all those phenomena. Future investigations can be conducted in the following four areas:

- The relationships between SRL and culture:

The large number of international students in American institutions indicated the meaningfulness of studying culture's influences on learning experiences. Although some researchers have made a great effort in exploring this area (McLoughlin, 1999; Wang & Reeves, 2007), they did not focus on the self-regulated aspect of the participants' learning in particular. This study had some interesting findings about cultural influences on SRL including: (1) cultural challenge for group collaboration, cultural influence on shaping learner's motivation (For example, Jane, Sheri, and Laura thought the instructor's fame was a big reason for their course enrollment.), cultural influence on students' attitude towards help-seeking from the instructor, and cultural influence on learners' perception on assessment (especially quizzes and exams). Considering these interesting directions, the investigation of students' self-regulation from a cultural perspective (the students' learning experiences in a different culture in particular) appeared promising.

- Course pedagogy and structure as a mediator on SRL:

It was the course instructor's long time struggle to decide how much structure would be appropriate for students. The answer to this question seemed related to the pedagogy used

in specific courses and who the learners are. An important component of pedagogy is the type of learning tasks used in courses. Although there are abundant studies about open-ended learning tasks and their implications for self-regulation, there is a lack of systematic examination on the relationship between course structure and SRL.

- The relationships between motivational beliefs, SRL and effort:

Some of the participants in this study were very self-aware and articulate about their self-generated thoughts, strategies, and processes. Among them, Laura and Mia were extremely hard working, illustrating almost every aspect of strategic learners. Their cases indicated a positive correlation between SRL and effort. However, self-awareness and positive motivational beliefs as found with Laura and Mia did not guarantee high level of self-regulation, since Tate offered an opposite example. Another student, Tyson, worked hard enough to meet course requirements but definitely saved his best effort. But he was self-regulated to the extent of achieving his own goals. As he said, he was learning what he needed to know, not what the instructor and the researchers wanted him to learn. These three cases suggested intriguing relationship between motivation, self-regulation, and effort.

- SRL development in adulthood:

Scholars have extrapolated development of SRL as long-term and social (cf., Pressley, 1995; Zimmerman & Schunk, 2001). Quite a few students mentioned in their interviews that they were very set in their ways after certain number of years of schooling or other experience, suggesting self-regulation as a relatively stable attribute. While SRL studies on younger learners are numerous, SRL literature on postsecondary adults is lacking.

Does this suggest no or little room for SRL growth after one gets into adulthood? If the answer is no, what are the critical contributing events or factors?

- Prior experience and SRL development in online courses:

Technology is ubiquitous nowadays, and online learning is no longer a new concept.

When learners experience less technical difficulties and get more familiar with online course features, will their self-regulation continue to evolve and how? One student in this study indicated that neither authentic tasks nor group work were new to her but the combination of them with online delivery was. Consequently, she was more self-regulated and learned a lot about how to work in this type of environment. Conversely, two other students with plenty of both online and group experience did not find much difference in their role as a learner as well as in self-regulation. Does that mean self-regulation stays stable after a learning curve? If that is the case, it is a good thing if a student reaches a high level of self-regulation after some experience and keeps performing at that level. However, if one's self-regulatory skills are still developing, how can the course help foster that? And how long does that take?

### **Limitations**

Despite careful conceptualization and implementation, this study has limitations in sampling, study time frame, self-report measurement, and researcher's experience. Regarding sampling, there are three constraints beyond my control that may influence the research results or their applicability:

Firstly, the several cycles of design involved different groups of students. The solutions derived from data collected from a particular cohort may not be as useful for another where learner characteristics are significantly different. Secondly, the research participants are all

graduate-level students who, in general, have a strong drive for learning and often relatively good study habits. Also, most of them are in the field of Instructional Technology and thus are likely to possess adequate technology skills. These may make findings regarding challenges for learning online specific to this type of student population and, therefore, limit their applicability to a broader audience. Thirdly, the students volunteered for this study are mostly active participants in the course, which seemed indicative of their self-regulation levels. There are also course participants who are less active but did not opt to participate in the study. However, learning experiences of these students will be equally, if not more, informative for exploring various levels and types of self-regulation. In a sense, the missing of some important piece of puzzle gets in the way of me understanding SRL's complexity and variety.

Next, the development of SRL takes time, but the learning snapshots of a cohort of students under study take place during one semester—a relatively short period of time. In this situation, there may not be much room for SRL improvement for some learners who are already expert, resourceful, and/or familiar with the type of learning environment in the course. Therefore, the evolution of students' SRL has been difficult to detect.

Third, this study relied heavily on participants' self-reports which may not be accurate reflections of their actual self-regulatory scenarios. To address this issue, I triangulated several different data sources from the participants, the instructor, and course discussions and tried to compare the findings with my observation notes.

Lastly, as a novice researcher, I am limited in my experience with and tactics for handling a fluid, dynamic, and complex design research process. Additionally, the analysis of massive amount of data is definitely complex and challenging. Although I tried to compare observations and findings with my fellow researcher who did her own study in the same online

course, this may still leave the study much room for improvement in terms of design, data treatment, and interpretation. Second, by serving multiple roles in this project, I inevitably bring to the research my own assumptions or biases; while I may realize and report some of these, others may remain unknown to me.

### **Conclusion**

The findings of this study indicated that the students in this evaluation course used a variety of self-regulatory processes and strategies to fulfill the course requirements as well as their personal aspirations. Additionally, they seemed to self-regulate their learning to the extent that they are aware of and willing to. The external factors in the online course environment influenced the students' motivation as well as self-regulated learning processes and strategies. Therefore, the regulation of learning was the result of the interactions between the course context and self. Design of online courses can support students self-regulation but to a certain degree. Using an educational design research approach, this study derived ten design principles for developing online course that support student self-regulation. To the end of online learner support, further exploration of the interactions among learner characteristics, self-regulation, and course design will help improve both research and practice in this area.

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Figure 4.1  
*The Weekly Outline of the E-Learning Evaluation Course.*

E-Learning Evaluation

You are logged in as Ying Liu: Student (Return to my normal role)

school ► Evaluation Return to my normal role

**People**  
Participants

**Activities**  
Chats  
Forums  
Resources  
Wikis

**Search Forums**  
   
Advanced search

**Administration**  
Grades  
Unenrol me from Evaluation

**My courses**  
EDIT 9990 Design Research in Education

**Weekly outline**

(2009)  
news forum

- Chatting room
- Groupwork Forum
- Groupwork Chatting Room
- Blue Team Wiki
- Green Team Wiki

11 February - 17 February

**WELCOME** to Week 1, everyone!  
Please complete the following activities:

1. Review the course syllabus
2. Introduce yourself and participate in Ice-breaking activity in Ice-Breaking Activity Forum
3. Read Chapter 1 from Course Textbook
4. Read Introduction and Section I from 2002 User-Friendly Handbook for Project Evaluation
5. View this narrated PowerPoint presentation about "Paradigms"
6. Post your questions and reflections on readings in Week 1 Readings Forum

**Latest News**

**Upcoming Events**  
There are no upcoming events  
[Go to calendar...](#)

**Messages**  
No messages waiting  
[Messages...](#)

Figure 4.2  
*The Process of the Design Research Project*

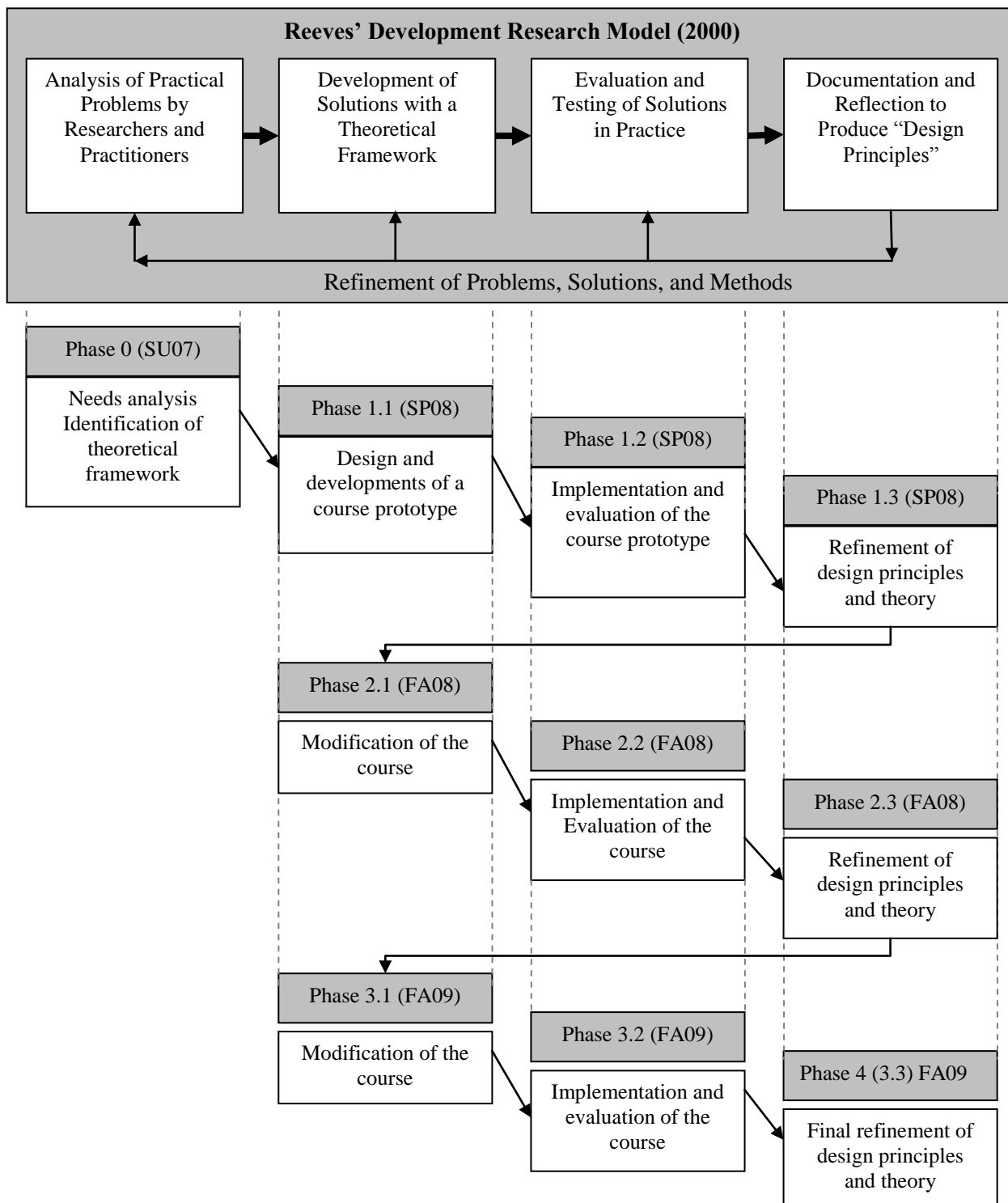


Table 4.1  
*Interview Schedule and Focus*

Interviews	Schedule and focus
Early-semester interview	Week 1- 6 <ul style="list-style-type: none"> <li>• Background information</li> <li>• Previous online learning experience</li> <li>• Motivational beliefs associated with the course</li> <li>• Typical learning processes and strategies associated with the course (e.g., time-management, note-taking, organization)</li> <li>• Felt challenges in the learning process</li> </ul>
Middle-of-semester interview	Week 7 -12 <ul style="list-style-type: none"> <li>• Change of motivational states</li> <li>• SRL processes and strategies (e.g., environmental structuring, help-seeking, resources-identification, monitoring, self-evaluation, collaboration)</li> <li>• Change in SRL processes and strategies</li> <li>• Perceptions about course work load, difficulty, and feedback</li> <li>• Felt challenges in the learning process</li> <li>• Support for learning</li> </ul>
End-of-semester interview	After Week 16 (after submission of evaluation report) <ul style="list-style-type: none"> <li>• Reflection on motivational states and changes</li> <li>• Reflection on motivating and learning processes/strategies</li> <li>• Reflection on learning results</li> <li>• Factors mediating learning experiences</li> <li>• Difference in the role as a learner when comparing this course with other ones</li> <li>• Suggestions for future students</li> <li>• Suggestions for design and implementation improvement (i.e., strategies, resources, instructor)</li> </ul>
Formal Instructor Interview	After Week 16 (When final grading is finished) <ul style="list-style-type: none"> <li>• Personal beliefs and perspective about pedagogy in the course</li> <li>• Overall reflection on the course and students' learning process</li> <li>• Comments on individual students' performance</li> <li>• Suggestions for design refinement</li> </ul>

Table 4.2  
*Survey Data*

Survey data	Schedule and focus
Evaluation Skills Inventory	<ul style="list-style-type: none"> <li>• At the beginning of the course</li> <li>• To identify students' evaluation related skills</li> </ul>
Student Profile Survey	<ul style="list-style-type: none"> <li>• At the beginning of the course</li> <li>• To identify students' personal, academic and professional backgrounds and to use information for forming groups</li> </ul>
Evaluation Planning Process Assessment (renamed as Mid-term Evaluation in second iteration)	<ul style="list-style-type: none"> <li>• In the middle of the semester</li> <li>• To help students reflect and assess their project work process</li> <li>• To identify group project needs and possible course improvements</li> </ul>
Peer evaluation	<ul style="list-style-type: none"> <li>• After submission of evaluation report</li> <li>• To identify individual students' contribution to the group project</li> </ul>
Self-evaluation	<ul style="list-style-type: none"> <li>• After submission of evaluation report</li> <li>• To solicit students' overall reflection on their learning, the learning experience and individual contribution to the group project</li> </ul>
Course Evaluation	<ul style="list-style-type: none"> <li>• After submission of evaluation report</li> <li>• To gauge effectiveness of the course and to solicit suggestions for course improvement</li> </ul>

Table 4.3  
*Archival Data*

Archival data	Sources and focus
Instructor's course materials and messages	<ul style="list-style-type: none"> <li>• Syllabus, rubrics, readings, resources, and instructor e-mails and announcement to students, feedback on project</li> <li>• Evidence of the evolution of the design and implementation of the course over three semesters</li> </ul>
Student quizzes	<ul style="list-style-type: none"> <li>• Quiz results of individual students</li> </ul>
Student evaluation plan and report	<ul style="list-style-type: none"> <li>• Evaluation plan and evaluation report.</li> <li>• Evidence of the quality of project outcomes</li> </ul>
Student interaction	<ul style="list-style-type: none"> <li>• Messages in discussion forums, e-mail, Wikis, and chatting rooms</li> <li>• Evidence of members' interaction within groups</li> </ul>

Table 4.4  
*Data Collection Methods and Sources for All Three Iterations*

Data Collection Methods	Data Sources	Iteration One	Iteration Two	Iteration Three
Interviews	First student interview	+++	+++	+++
	Second student interview	+++	+++	+++
	Third student interview	+++	+++	+++
	Formal instructor interview	+++	+++	+++
	Informal meetings with instructor	+++	+++	+++
Surveys	Evaluation skills inventory	++	++	++
	Student profile survey	++	++	++
	Evaluation planning process assessment	++	++	
	Peer and self - evaluation	++	++	++
	Course evaluation		++	++
Archival data	Individual quizzes results		++	++
	Evaluation plan and feedback	++	++	++
	Evaluation report and feedback	++	++	++
	Course materials	+	+	+
Observations	Online weekly discussions	+	+	+
	Emails	+	+	+
	Group wikis	+	+	+
	Group Discussion Forums	+	+	+

+++ : Major data sources

++ : Secondary data sources

+ : Supplementary data sources

Empty cell: No use of data collection methods

Table 4.5  
*Alignment of Data Sources to Research Questions*

Data Sources	Interview	Survey	Artifacts	Observation
Q1. How is the motivational aspect of the students' self-regulated learning evident in this course?	+++	++	+	+
Q2. How does the environment affect students' self-regulated learning and what challenges do the students encounter?	+++	++	+	+
Q3. How do students use self-regulated processes and strategies in the course?	+++	+	+	+
Q4. What support can be built in this learning environment to promote students' self-regulated learning?	+++	+++	+	+

+++ : Major data sources

++ : Secondary data sources

+ : Supplementary data sources

Table 4.6  
*Coding Framework for the Qualitative Data*

Q1: How is the motivational aspect of the students' self-regulated learning evident in this course?		Data Sources
Coding	Sub-coding	student interviews, instructor interview, student profile survey, evaluation skills inventory, observations
• Goals	Sub-coding themes to be derived when trends appear	
• Task value		
• Self-efficacy		
Q2. How does the environment affect students' self-regulated learning and what challenges do the students encounter?		Data Sources
Coding	Sub-coding	student interviews, instructor interview, observations, student documents (i.e. evaluation reports, quizzes, online discussion)
• Authentic task	Sub-coding themes to be derived when trends appear	
• Collaborative work		
• Online learning environment		
Q3. How do students use self-regulated processes and strategies in the course?		Data Sources
Coding	Sub-coding	student interviews, observations, self and peer evaluation, student documents (i.e. evaluation reports, quizzes, online discussion)
• SRL processes	Sub-coding themes to be derived when trends appear in relation to Zimmerman's SRL key SRL processes	
• SRL strategies		
Q4. What support can be built in this learning environment to promote students' self-regulated learning?		Data Sources
Coding	Sub-coding	student interviews, instructor interview, observations, student documents (i.e. evaluation plan and report, quizzes, online discussion)
• Challenges for learning	Sub-coding themes to be derived when trends appear	
• Support for learning		

Table 4.7  
*First iteration Participant Profiles – Demographics (First Iteration)*

Name	Age	Sex	Location	Group	Program Level	Job	Previous Online Courses	Technology Skills	Motivation	Confidence Level
Amy	46-60	F	Australia	A	Masters of Education in IT (100% online)	Teach computing in high school	2 taken 3 taught	7 out of 10	Job application	7 out of 10
Irvin	26-35	M	Australia-Cyprus (International student from Cyprus)		Full time doctoral student in IT		9 online 10 blended	10 out of 10	Learning and Application	10 out of 10
Laura	36-45	F	U.S.A (International student from Lithuania)		Full-time doctoral student in IT	part time assistantship work	4	8 out of 10	Learning	7 out of 10
May	46-60	F	Australia	B	Masters student in IT	Educational Designer	4	9 out of 10	Job application	8 out of 10
Judy	46-60	F	U.S.A.		Non-degree seeking	Associate Director for Evaluation at a U.S. university	None (Has online teaching experience)	7 out of 10	Job application	9 out of 10

Table 4.8.  
*First Iteration Participant Profiles – Online Experiences (First Iteration)*

Name	Previous Online Experience- Positive Aspects	Previous Online Experience-Challenging Aspects
Amy	Choice of time to work on subjects and assignments. Ease of information sharing with others Learning new ideas	Overcoming feelings of isolation Difficulty to gain clarification as it is dependent on the writing skills of the student
Irvin	Getting appropriate feedback in a reasonable time	Lack of communication
Laura	Textual nature of communication allows adequate time to comprehend materials, reflect, and engage in discussion. Communication online helps international students overcome difficulties caused by language barriers and lack of confidence. Convenience of learning at desirable time and place Writing leads to more learning gains. Learning a lot from others – both from their mistakes and great ideas etc.	Collaboration on higher cognitive tasks
May	Convenience - study at times and places that suited me.	Anxiety over administrative issues Preference to deal with a real person, rather than submitting a form or email when having a question or problem
Judy	Serving an audience who might not otherwise have an opportunity to pursue higher education	Math seems to be especially hard to teach online. Difficulty to feel as engaged with students(comparing to teaching in the classroom)

Table 4.9  
*Summary of Motivational Aspects of SRL in the Course (First Iteration)*

Motivational Beliefs	<p>Goals: Learning or application oriented goals or a combination of both</p> <p>Task value: The course tasks are perceived as very relevant.</p> <p>Self-efficacy: In general, students' confidence levels were high at the beginning, dropped a little in the middle of semester and returned to a high level at the end of the course.</p>
Motivation Change	<p>Demotivating factors:</p> <ul style="list-style-type: none"> <li>• personal issues</li> <li>• group or learning-related issues</li> <li>• technology issues</li> </ul>
Motivational Strategies	<p>Using commitment as a motivator</p> <p>Self-talk or self-encouragement</p> <p>Engaging in conversation</p> <p>Striving for quality</p>

Table 4.10  
*Summary of Environmental Influence on SRL in the Course (First Iteration)*

Group work	Positive impact of group work	<ul style="list-style-type: none"> <li>• Knowledge construction</li> <li>• Mutual support</li> <li>• accountability</li> </ul>
	Negative impact of group work	<ul style="list-style-type: none"> <li>• Extra time for communication</li> <li>• Feeling of dependence on others</li> </ul>
	Group work strategies	<ul style="list-style-type: none"> <li>• Asking questions and listening to others</li> <li>• Doing the best while inviting others for participation</li> <li>• Interacting more with people of similar cultural background</li> <li>• Establishing a personal relationship with group members</li> <li>• Implying a point instead of speaking explicitly</li> </ul>
Authentic tasks	<ul style="list-style-type: none"> <li>• Immediacy of knowledge application and real impact</li> <li>• Different roles of learners</li> <li>• Clients making a difference on learning experience</li> </ul>	
Other aspects of course design	<ul style="list-style-type: none"> <li>• Group wikis</li> <li>• Course layout and materials</li> <li>• Instructor feedback</li> <li>• Structure</li> </ul>	
Challenges	<ul style="list-style-type: none"> <li>• Staying on task</li> <li>• Communication and group-related issues</li> <li>• Language and culture challenge</li> <li>• Learning about content</li> </ul>	

Table 4.11  
*Summary of SRL Processes and Strategies (First Iteration)*

Staying on tasks	Environmental structuring	<ul style="list-style-type: none"> <li>• Structuring physical environment to escape distractions</li> <li>• Psychological space structuring</li> </ul>
	Flexible scheduling	<ul style="list-style-type: none"> <li>• To accommodate group work</li> <li>• To maximize study time</li> </ul>
	Prioritizing work for this course	
Managing learning process	Strategic planning	<ul style="list-style-type: none"> <li>• Use the course syllabus, task descriptions, work examples, and deadlines as important tools</li> <li>• Combining study and work</li> <li>• Breaking down a big task to smaller parts</li> </ul>
	Note-taking and material organization	
	Monitoring	<ul style="list-style-type: none"> <li>• Ensuring steady progress on the course tasks by use of external resources and discipline</li> <li>• Gauging cognitive gains through online discussion and practical application of book knowledge</li> </ul>
Maximizing learning resources	Researching	<ul style="list-style-type: none"> <li>• Better understanding the course tasks and content</li> <li>• Familiarizing with the subjects of evaluation project</li> <li>• Finding and using appropriate methods and tools for evaluation and data processing.</li> </ul>
	Help seeking between peers in and outside the course	
Reflection	Self-reflection	<ul style="list-style-type: none"> <li>• Group work</li> <li>• Performance</li> <li>• Learning</li> </ul>
	Self-evaluation	<ul style="list-style-type: none"> <li>• Contribution to the group project</li> <li>• Application and transfer of learning</li> <li>• Feedback from others</li> </ul>

Table 4.12  
*Summary of Supports for SRL in the Course (First Iteration)*

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Supports for SRL

---

Enhancing course structure and guidance

Enriching course materials and resources

Improving communication at all levels

Using technology to facilitate learning

Creating a strong online presence

Supporting students to overcome distractions and circumstances

Providing ample opportunities for individual students to evaluate learning processes and gains

---

Table 4.13  
*Refined Design Principles and Strategies from the First Iteration (Spring 2008)*

1. Engage students with authentic learning tasks	<ul style="list-style-type: none"> <li>• Use authentic evaluation tasks</li> <li>• Clarify task relevance</li> <li>• Design online activities that are grounded in authentic problems to generate interest</li> </ul>
2. Create a strong online presence	<ul style="list-style-type: none"> <li>• Help students to go to know each other through ice-breaking activities</li> <li>• Ask each class member to upload a picture</li> <li>• Use tools in CMS instead of email for whole class interactions</li> <li>• Sustain a high participation level of both instructor and students</li> </ul>
3. Enhance course structure and guidance	<ul style="list-style-type: none"> <li>• Communicate instructor expectations about commitment, outcomes, and work quality at beginning of semester</li> <li>• Provide clear due dates</li> <li>• Provide advice from previous students on how to succeed in the course</li> <li>• Provide general guidelines for authentic evaluation projects to the whole class</li> <li>• Provide specific guidance for specific group projects as needed</li> </ul>
4. Enrich course materials and resources	<ul style="list-style-type: none"> <li>• Provide a variety of engaging study materials and resources relevant to course project</li> <li>• Make all course materials readily available and print-friendly</li> </ul>
5. Improve communication and interactions at all levels	<ul style="list-style-type: none"> <li>• Take time zone differences into consideration when designing course activities.</li> <li>• Assisting students in troubleshooting at times of technology break-down</li> <li>• Encourage use of tools provided at the course site as much as possible</li> <li>• Model expected communication mode by maximizing use the Moodle tools for communicating with the whole class</li> <li>• Help students sustain communication with clients</li> <li>• Encourage help-seeking at all times (with the course instructor and facilitators/designers) via emails, drop-in visits, phone calls, Instant Messaging chat, etc.</li> </ul>

Table 4.13

*Refined Design Principles and Strategies from the First Iteration (Spring 2008) (continued.)*

6. Provide guidance for group work and facilitate group collaboration	<ul style="list-style-type: none"> <li>• Guide students to select a group leader</li> <li>• Encourage regular group meetings and minutes keeping</li> <li>• Assist in resolving group and project issues at an early stage</li> </ul>
7. Provide ample opportunities for individual students to assess learning processes and gains	<ul style="list-style-type: none"> <li>• Encourage use of evaluation rubrics for course projects and other assignments</li> <li>• Incorporate quizzes to reflect individual learning outcomes</li> <li>• Use mid-term evaluation, peer and self-evaluation, and final course evaluation to improve individual and group performance as well as course design</li> </ul>

Figure 4.3  
The E-Learning Evaluation Course Design Version 2.0 (Fall 2008) (Printable Version)

**EDIT 8350 E-Learning Evaluation Fall 08** You are logged in as [Ying Liu](#) (Logout)

school ▶ EvalFall08 Switch role to... Turn editing on

**People**

- Participants

**Activities**

- Chats
- Forums
- Quizzes
- Resources
- Wikis

**Search Forums**

  
  
[Advanced search](#)

**Administration**

- Turn editing on
- Settings
- Assign roles
- Grades
- Groups
- Backup
- Restore
- Import
- Reset
- Reports
- Questions
- Files
- Profile

### Weekly outline

- Course news forum
- Moodle Survival Guide
- Chat-space
- [Evaluation Groupwork Forum] Group 1
- [Evaluation Groupwork Forum] Group 2
- [Evaluation Groupwork Forum] Group 3
- [Evaluation Groupwork Forum] Group 4
- [Evaluation Groupwork Forum] Group 5
- Group 1 Wiki
- Group 2 Wiki
- Group 3 Wiki
- Group 4 Wiki
- Group 5 Wiki

18 August - 24 August

**WELCOME**

to Week 1, everyone!

Please complete the following activities:

- Review the [Course Syllabus](#)
- View this narrated PowerPoint presentation [Welcome to the Course](#)
- Introduce yourself and participate in ice-breaking activity in [Ice-Breaking Activity Forum](#)
- Read [Chapter 1](#) from [Course Textbook](#)

**Latest News**

[Add a new topic...](#)

14 Dec, 12:57  
Thomas Reeves  
[Final Weekly Update more...](#)

1 Dec, 21:01  
Thomas Reeves  
[Week 16 Update more...](#)

24 Nov, 18:30  
Thomas Reeves  
[Week 15 Update more...](#)

17 Nov, 10:09  
Thomas Reeves  
[Week 14 Update more...](#)

11 Nov, 12:28  
Thomas Reeves  
[Week 13 Update more...](#)  
[Older topics ...](#)

**My Course Mail**

[Check Mail](#)

**Calendar**

June 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18

Table 4.14  
*Second Iteration Participant Profiles – Demographics (Second Iteration)*

Name	Age	Sex	Location/ Nationality	Group	Program Level	Previous Online Courses	Technology Skills	Motivation	Confidence Level
Katie	36-45	F	U.S. west	A	Doctoral program in IT	1	7 out of 10	Learning	10 out of 10
Tate	36-45	M	U.S. southeast		Doctoral program in IT	Several blended	9 out of 10	Learning & application	8 out of 10
Sheri	26-35	F	U.S. southeast /Korea		Master's program in IT	4	9 out of 10	Learning & application	9 out of 10
Jane	26-35	F	U.S. southeast/ Korea	B	Doctoral program in IT	N/A	N/A	N/A	N/A
Cindy	36-45	F	U.S mid-west/ Trinidad and Tobago		Doctoral program in Learning Technologies	15+	10 out of 10	Learning & application	10 out of 10
Karol	26-35	F	U.S. mid-west		Doctoral program in IT	12-15	9 out of 10	Learning & application	9 out of 10
Tyson	36-45	M	U.S. southeast		Doctoral program in IT	Many	5 out of 10	Learning & application	10 out of 10
Carrie	36-45	F	Canada	C	Doctoral program in IT	3	7 out of 10	Learning & application	8 out of 10
Gary	26-35	M	U.S. southeast		Doctoral program in IT	2	8 out of 10	Learning & application	7 out of 10
Ally	46-60	F	U.S. southeast	D	Doctoral program in IT	6+	8 out of 10	Learning & application	7 out of 10
Mia	46-60	F	U.S. mid-west		Doctoral program in IT	2	10 out of 10	Learning & application	9 out of 10

Table 4.15

*Second Iteration Participant Profiles – Online Learning Experiences (Second Iteration)*

<b>Name</b>	<b>Previous Online Experience - Positive Aspects</b>	<b>Previous Online Experience - Challenging Aspects</b>
Katie	Convenience	Absence of instant feedback from an instructor or other students
Tyson	Freedom in scheduling study times	Developing rapport with instructors and other students
Sheri	Discussion with other team members	Motivation
Jane	N/A	N/A
Cindy	Sharing information with other participants that one would not normally have the opportunity to share information or have discussions with.	Building trust with a participant who had trust issues
Karol	Open discourse, learning and meeting new friends and colleagues	Difficult coordination for group work, intimidating course environments that inhibit discussion
Tate	Ability to access materials anytime	Lack of social network with students and instructor
Carrie	Ability to access the course from any location and at any time	Technological glitches; courses that required the learner to follow lessons page by page and poor support
Gary	Depth of asynchronous discussions — students had time to think critically about what they wanted to say and articulate their thoughts thoroughly.	Understanding the instructor's expectations.
Ally	Increased flexibility	Collaborative work
Mia	Learning new technologies	Collaboration

Table 4.16  
*Evaluation Skills Inventory Survey Results (Fall 2008)*

Name	Tate	Sheri	Mia	Carrie	Gary	Tyson	Cindy	Katie	Ally	Karol
Q1	3	5	5	7	5	6	6	6	6	3
Q2	3	7	8	7	2	3	8	6	6	3
Q3	4	5	10	7	6	3	7	6	6	2
Q4	4	6	10	6	6	3	7	5	5	1
Q5	4	7	7	7	4	1	7	4	6	1
Q6	4	6	7	6	6	1	7	3	6	1
Q7	5	6	10	8	7	1	7	5	6	2
Q8	5	8	7	8	7	1	6	3	6	1
Q9	5	7	7	3	4	1	5	5	5	1
Q10	5	6	7	3	4	1	5	4	5	1
Q11	0	5	7	0	7	3	6	1	6	1
Q12	3	6	7	5	4	3	6	1	6	1
Q13	4	6	7	8	4	2	7	0	5	1
Q14	6	8	9	0	8	7	8	6	7	7
Q15	2	1	8	8	2	4	6	6	7	4
Q16	2	1	8	7	2	3	6	5	6	4
Q17	2	1	8	8	2	4	6	6	6	3
Q18	2	1	8	7	2	3	6	5	6	3
Q19	4	5	7	6	4	2	7	2	6	1
Q20	4	5	7	6	5	1	7	4	6	1
Q21	Ally: Generated a Summative Evaluation Proposal for Education Program based in North Pakistan.									

Evaluation Skills Inventory Questions (Please rate your skills level on a scale from 0 nonexistent to 10 expert)

1. Interpret research and evaluation reports as reported in the professional literature.
2. Write a comprehensive literature review.
3. Interact with evaluation clients in a face-to-face context to obtain the information you need for evaluation planning.
4. Interact with evaluation clients in an online context to obtain the information you need for evaluation planning.
5. Prepare an evaluation plan.
6. Incorporate a specific "evaluation model" into your evaluation plan.
7. Conduct a needs assessment.
8. Develop a questionnaire for a program evaluation.
9. Develop an interview protocol for a program evaluation.
10. Develop a focus group protocol for a program evaluation.

11. Conduct a heuristic evaluation of an e-learning program.
12. Use expert review as an evaluation strategy.
13. Use expert review as an evaluation strategy.
14. Conduct an online survey using software such as SurveyMonkey or QuestionPro.
15. Understand the principles of descriptive statistical analysis.
16. Apply the principles of descriptive statistical analysis.
17. Understand the principles of inferential statistical analysis.
18. Apply the principles of inferential statistical analysis.
19. Implement an evaluation plan.
20. Prepare an evaluation report.
21. Please list any other knowledge and skills you have that you believe we should know about in the context of this “E-Learning Evaluation” course.

Table 4.17  
*Summary of Motivational Aspect of SRL in the Course (Second Iteration)*

Motivational beliefs	<ul style="list-style-type: none"> <li>• Goals: <ul style="list-style-type: none"> <li>○ Intrinsic: learning or application oriented goals or a combination of both</li> <li>○ Extrinsic: meeting program requirements, instructor's reputation</li> </ul> </li> <li>• Task value: The course tasks are perceived as very relevant.</li> <li>• Self-efficacy: In general, students' confidence levels were high, but some students' confidence also depended upon factors other than their abilities and efforts (e.g., group work, interactions with client)</li> </ul>
Motivation change	<ul style="list-style-type: none"> <li>• No or little change in overall motivation</li> <li>• Minor fluctuation;</li> <li>• Positive motivation change</li> <li>• Big decrease in motivation</li> <li>• Demotivating factors: group issues</li> </ul>
Motivational strategies	<ul style="list-style-type: none"> <li>• Self-persuasion</li> <li>• Doing/action</li> <li>• Using extrinsic motivator</li> <li>• Seeking social support</li> <li>• Discipline</li> </ul>

Table 4.18  
*Summary of Environmental Influences on SRL in the Course (Second Iteration)*

Group work	Positive impact	<ul style="list-style-type: none"> <li>• Different perspectives and stronger motivation</li> <li>• Share workload</li> <li>• Learning about group work</li> </ul>
	Negative impact	<ul style="list-style-type: none"> <li>• Demotivation and stress caused by unsmooth collaboration</li> <li>• Feeling being hindered</li> <li>• Learning about more things if working alone</li> </ul>
	Group leaders	<ul style="list-style-type: none"> <li>• Leader role helped students to be more active and self-regulated</li> </ul>
	Group work strategies	<ul style="list-style-type: none"> <li>• Group and task management</li> <li>• Group process monitoring and problem resolution</li> <li>• Find a comfortable way to work</li> <li>• Strategies to work with a member with high expectations</li> </ul>
Authentic tasks	<ul style="list-style-type: none"> <li>• Increased accountability and a realistic feeling</li> <li>• Deepened understanding of content and widened scope of learning</li> <li>• Less desirable effects associated with authentic task: <ul style="list-style-type: none"> <li>○ stress,</li> <li>○ artificialness of experience</li> <li>○ direct experience with certain aspects but not all</li> </ul> </li> </ul>	
Online discussions	<ul style="list-style-type: none"> <li>• Content learning from discussions</li> <li>• Postponed posting time</li> <li>• Attitudes about being the first one to post</li> <li>• Online discussion expectations and approaches</li> <li>• Adjustments in discussions</li> </ul>	
Technology	<ul style="list-style-type: none"> <li>• Helpful features of Moodle</li> <li>• Overcome technology glitches</li> <li>• Technological tools to facilitate learning</li> </ul>	
Other helpful aspects	<ul style="list-style-type: none"> <li>• Course structure</li> <li>• Materials and resources</li> <li>• Open information sharing</li> <li>• Instructor</li> </ul>	
Challenges	<ul style="list-style-type: none"> <li>• Online communication and collaboration,</li> <li>• Time</li> <li>• Authentic tasks</li> <li>• Learning about evaluation</li> </ul>	

Table 4.19  
*Summary of SRL Processes and Strategies (Second Iteration)*

Planning	Time management	<ul style="list-style-type: none"> <li>• Use quality time</li> <li>• Find time to study steadily</li> <li>• Scan and get a big picture at the beginning of week</li> <li>• Complete course duties</li> <li>• Accommodate group work</li> <li>• Adjustment in time management</li> </ul>
	Prioritizing	<ul style="list-style-type: none"> <li>• Deadlines</li> <li>• Interest</li> <li>• Challenge level of tasks</li> <li>• Group collaboration</li> </ul>
Monitoring	Group monitoring	<ul style="list-style-type: none"> <li>• Check for each other</li> </ul>
	Individual monitoring	<ul style="list-style-type: none"> <li>• Use checklists</li> <li>• Use online discussion to monitor understanding</li> <li>• Other monitoring strategies</li> </ul>
Self-reflection & self-evaluation	<ul style="list-style-type: none"> <li>• Application of knowledge in evaluation projects</li> <li>• Online discussions</li> <li>• Feedback from peers and instructor</li> <li>• Quizzes</li> </ul>	
Resource finding and help seeking	<ul style="list-style-type: none"> <li>• Mostly use resources provided by the instructor</li> <li>• Effort in obtaining additional resources</li> <li>• Seek help within the group</li> <li>• Seek help from people around them</li> <li>• Seek help from instructor for learning-, project-, and group-related issues</li> </ul>	

Table 4.20  
*Summary of Supports to Promote Self-regulated Learning (Second Iteration)*

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Supports for SRL

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Providing more guidance for group work

Guiding and moderating online discussions

Assisting students in time management

Providing assessment at appropriate intervals and with consistent challenge level

Sequencing course content and activities to match project progress

Offer more work examples and earlier and encourage students to use provided resources wisely

Assisting students in monitoring through weekly reminders and frequent check-ins and updates

Reach out to individual students

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Table 4.21  
*Refined Design Principles and Strategies from Second Iteration*

Principles	Design and implementation strategies
1. Engage students with relevant and meaningful learning tasks	<ul style="list-style-type: none"> <li>• Use authentic evaluation tasks</li> <li>• Clarify task relevance</li> <li>• Design online activities that are grounded in authentic problems to generate interest</li> <li>• Sequence materials and activities to match project progress</li> <li>• Encourage risk taking, trial-and-error</li> </ul>
2. Create a strong online presence	<ul style="list-style-type: none"> <li>• Help students to go to know each other through ice-breaking activities</li> <li>• Ask each class member to upload a picture</li> <li>• Create an discussion board for socialization purpose (“student lounge”)</li> <li>• Use tools in CMS instead of email for whole class interactions</li> <li>• Sustain a high participation level of both instructor and students</li> </ul>
3. Enhance course structure and guidance	<ul style="list-style-type: none"> <li>• Communicate instructor expectations about commitment, outcomes, and work quality at beginning of semester</li> <li>• Provide clear due dates</li> <li>• Provide advice from previous students on how to succeed in the course</li> <li>• Provide general guidelines for authentic evaluation projects to the whole class</li> <li>• Provide specific guidance for specific group projects as needed</li> </ul>
4. Enrich course materials and resources and communicate expectations about resource use	<ul style="list-style-type: none"> <li>• Provide a variety of engaging study materials and resources relevant to course project</li> <li>• Make all course materials readily available and print-friendly</li> <li>• Encourage critical thinking and adaptive resource use</li> <li>• Offer work examples early on</li> <li>• Encourage open resources sharing among students</li> </ul>
5. Improve communication and interactions at all levels	<ul style="list-style-type: none"> <li>• Take time zone differences into consideration when designing course activities.</li> <li>• Assisting students in troubleshooting at times of technology break-down</li> <li>• Encourage use of tools provided at the course site as much as possible</li> <li>• Model expected communication mode by maximizing use the Moodle tools for communicating with the whole class</li> <li>• Model professional communication manners by copying group members on most of the instructor’s email correspondence with that group’s client</li> <li>• Help students sustain communication with clients</li> <li>• Encourage help-seeking at all times (with the course instructor and facilitators/designers) via emails, drop-in visits, phone calls, Instant Messaging chat, etc.</li> <li>• Reach out to individual students</li> </ul>

Table 4.21  
*Refined Design Principles and Strategies from Second Iteration (continued.)*

6. Guide and moderate online discussions	<ul style="list-style-type: none"> <li>• Use practical discussion topics that connect to the course evaluation projects</li> <li>• Set a deadline for initial postings</li> <li>• Provide a rubric for grading discussions</li> <li>• Build an open but safe a culture so that students feel free to disagree yet in a respectful manner</li> <li>• Moderate online discussions intermittently and when interventions are needed</li> </ul>
7. Assist students in planning and time management	<ul style="list-style-type: none"> <li>• Scaffold planning for evaluation project</li> <li>• Emphasize deadlines</li> <li>• Introduce project interim deadlines</li> <li>• Advise how to pace important work</li> <li>• Model planning by sharing travel arrangement at the beginning of semester</li> </ul>
8. Assist students in monitoring	<ul style="list-style-type: none"> <li>• Encourage students to review course objectives and check their skills against the Evaluation Skills Inventory towards the end of semester</li> <li>• Present weekly tasks in an outline format in Moodle</li> <li>• Send email reminders containing weekly tasks in the middle of each week</li> <li>• Use frequent check-ins for group projects</li> <li>• Post weekly updates in Moodle</li> <li>• Provided individualized and constructive feedback in a timely manner</li> <li>• Turn on online discussion subscription feature to help students follow new postings</li> <li>• Encourage use of technology-enhanced monitoring tools</li> </ul>
9. Provide guidance for group work and facilitate group collaboration	<ul style="list-style-type: none"> <li>• Guide students to select a group leader</li> <li>• Guide group members to reconcile expectations about collaboration and the group project</li> <li>• Encourage co-regulation of self and peer</li> <li>• Encourage regular group meetings and minutes keeping</li> <li>• Encourage use of collaborative tools, especially collaborative editing tools with record tracking functionality</li> <li>• Assist in resolving group and project issues at an early stage</li> </ul>
10. Provide ample opportunities for individual students to assess learning processes and gains	<ul style="list-style-type: none"> <li>• Encourage use of evaluation rubrics for course projects and other assignments</li> <li>• Use non-threatening assessment such as low-stake quizzes</li> <li>• Make sure the assessments are provided at appropriate intervals and with a consistent challenge level</li> <li>• Use mid-term evaluation, peer and self-evaluation, and final course evaluation to improve individual and group performance as well as course design</li> </ul>

CHAPTER 5  
SUPPORTING ONLINE SELF-REGULATION THROUGH COURSE DESIGN, MODELING,  
AND FACILITATION<sup>1</sup>

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<sup>1</sup>Liu, Y. & Reeves, T. C. To be submitted to *Education Technology*.

### Abstract

Many theorists have advocated the positive influences of self-regulation in improving student learning, supported by growing evidence of successful applications of self-regulatory scaffolds in traditional classrooms as well as in technology-enhanced learning environments. Nonetheless, some aspects of supporting self-regulation remain unclear, and there is a lack of specific guidelines for implementing supportive strategies in online courses. The goal of this paper is to provide practitioners with field-tested information from a real case so they can perceive how they can go about promoting self-regulation in an online course setting. This paper presents a case in which the course instructor supported students' self-regulation through deliberate course design, modeling, and facilitation. The highlights of the case and the derived general principles provide practical guidelines to practitioners, including instructors and instructional designers, who want to learn about and assist their students in becoming more self-regulated learners who can optimize their learning in the online courses.

*It is 9 o'clock on a Thursday night. After putting his two children to sleep, Simon is preparing survey questions that his group in the E-Learning Evaluation course will use for a survey to be administered to 9th graders at a nearby middle school for evaluating "Exploring Nature"—a computer-based science simulation program. He and his colleagues have worked for the evaluation project for over one and a half months, and finally it is time to try out their newly acquired evaluation skills. The survey questions need to be ready by Simon's group meeting at 4 this coming Monday afternoon so that everyone can take a look and provide some feedback. In constructing the questions, Simon has reviewed the course readings and presentations on instrumentation again. He also read relevant links that the instructor provided as additional resources in the course. Further, Simon has spent some time with the science program previously. So he feels like he should not have too much difficulty generating survey questions that make sense to the 9<sup>th</sup> graders.*

This scenario described how a graduate student, in a self-regulated manner, worked on his assignment based on a collaborative, authentic learning task, in this case evaluating a commercial e-learning product for a real client. Guided by emerging learning theories, many educators have become interested in giving students' more active control of their learning experiences. To be able to obtain the knowledge and skills they need for current or future careers, students are expected to juggle their various life and school responsibilities and at the same time actively engage with the content of every course they take. Of course, not all the courses are equally appealing. Some have interesting content but the activities are too boring or not-learner-friendly in terms of course design. In particular, online courses are more easily neglected because the learners are not required to physically show up in a classroom at a particular time, making procrastinating with respect to course activities and assignments easy.

Innovative instructors have actively looked for ways to help students better organize their study in online courses so that they be more engaged and gain substantially from the learning opportunities. Student self-regulation in academic contexts has been investigated for over a quarter of century. With nearly ubiquitous access to web-based technology, how to be a successful learner in online classrooms has become a new center of research. The online delivery of instruction not only presents wider access to learning resources that are otherwise unavailable to many learners, but also poses considerable challenges in terms of study management in this new type of learning environment. With these challenges in mind, many higher education instructors have become interested in promoting self-regulated learning in their online teaching. Before they can do this successfully, however, educators must understand what self-regulated learning entails and how it can be supported.

### **What is Self-regulated Learning**

To scholars and researchers with dissimilar perspectives, SRL has different meanings in different situations (cf. Boekaerts, Pintrich, & Zeidner, 2000; Zimmerman & Schunk, 2001). Pintrich (2000) defined academic self-regulation 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). In some other situations, SRL refers to the self-regulatory strategies students use to regulate their cognition and control their learning (Pintrich, 1995). A commonly accepted definition by Zimmerman and Schunk (1989) maintains that SRL encompasses students’ self-generated thoughts, feelings, and actions that students systematically apply toward attainment of their goals.

Thus, self-regulated learning, with various definitions, can be interpreted as the general capacity of students to direct and control their own learning. Theorists consider SRL to be “a complex, super-ordinate set of functions located at the junction of several fields of psychological research” (Boekaerts & Corno, 2005, p.200). SRL involves virtually every aspect of learning, including regulation of motivation, cognition, and behavior (Pintrich, 2004).

#### *Key Aspects of Self-regulated Learning and Characteristics of Self-regulated Learners*

Though interpreted somewhat differently based on varying educational philosophies, SRL encompasses several complicated processes: (1) calibrating one’s own motivational state, knowledge, skills, tasks, and context, (2) applying cognitive, metacognitive strategies and resources, (3) monitoring learning process and performance, and (4) evaluating progress and adjusting internal and external conditions (see Zimmerman & Schunk, 2001). Self-awareness is the key enabling element in the overall self-regulatory process.

There are four assumptions about learning and regulation shared by many SRL models (Pintrich, 2000). First, the active, constructive assumption, which is derived from the cognitive perspective of learning, posits that learners are active, constructive participants in the learning process. The second assumption, potential for control, suggests that learners are capable of monitoring, controlling, and regulating some aspects of their own learning to a certain extent. However, the models do not assume such capability at all times or under all circumstances. The third assumption, goal, criterion, or standard, indicates that some type of criteria or standards always exists against which the learner compares his learning processes and products. The fourth assumption deals with the role of self-regulatory activities as mediators between personal and contextual characteristics and actual learning performance. In other words, learner,

environmental, and other characteristics do not exert influences on learning without being filtered through the learner's own self-regulation of his cognition, motivation, and behavior.

Under these conceptualizations, self-regulated students are active, goal-directed learners who rely on their internal resources to take control of their learning while interacting with the external environment. Expert learners who are autonomous, strategic, reflective, and resourceful (Ertmer & Newby, 1996; Wolters, 2003) not only possess cognitive knowledge but also understand how to take control of their learning through strategy use, self-monitoring, and evaluation (Butler & Winne, 1995; Corno, 1986). In addition, these learners are capable of constantly adjusting strategies and altering their behaviors when feedback indicates such a need. They also make efforts to escape from distractions, implement concrete learning plans (Corno, 1993, 2001), and interact with tasks (Winne & Hadwin, 1998) and external environments (Zimmerman, 2001) to maximally enhance their learning. In summary, a self-regulated learner can be characterized as a self-conscious and active student who:

1. Is aware of his/her own small-grained learning processes, thoughts, behaviors, and feelings;
2. Is in most cases driven by intrinsic motivation and has a high concern for learning;
3. Has high self-efficacy in his/her abilities to perform well in a given subject area;
4. Plans for what, when, where and how to study;
5. Makes arrangements in time and physical environment for better concentration;
6. Monitors his/her learning process and learning gains;
7. Uses cognitive, metacognitive, and motivational strategies in response to various learning scenarios and challenges;
8. Reflects often on learning;

9. Evaluates his/her learning against certain external or self-generated standards;
10. Seeks learning resources individually or through interactions with others.

Psychologists have argued that the development of self-regulation is a complex, long-term, and social process (cf. Pressley, 1995; Zimmerman & Schunk, 2001). Nevertheless, research does suggest ways in which SRL can be supported in various learning environments. Specifically, in online learning environments, the potential for fostering learning capacities and skills, such as self-regulation and collaborative learning, has been demonstrated, as is detailed below (e.g., Dell, 2006; McConnell, 1994; Richardson & Newby, 2006).

### **Self-regulated Learning and Online Learning Environments**

Online learning that “uses the Internet to deliver some form of instruction to learners separated by time, distance or both” (Dempsey & Van Eck, 2002, p.283) has been widely adopted by universities, corporations, and different types of organizations for a variety of reasons, such as scheduling convenience, cost-effectiveness, and inclusion of students who are otherwise unreachable. For individual learners, online learning provides both opportunities and challenges for students to self-regulate their study. First, the flexibility of time and space increases learners’ choices (Song, Singleton, Hill, & Koh, 2004; Williams & Hellman, 2004). More time allows students to think deeply and generate thoughtful responses, thus increasing the chances for cognitive and metacognitive reflection (Meyer, 2003; Song et al., 2004). Yet, these very features require higher levels of self and resource management (Hantula, 1998; Hill, 2002) and knowledge and skills necessary to make informed choices (Schraw, 1998). Documented pitfalls of this learning mode included reported anxiety and fear (Conrad, 2002), lack of social interactions (Hill, 2002), and greater requirements for learning skills (Dabbagh & Bannan-Ritland, 2005), among others.

Therefore, online learning presents a shift in learner roles. While face-to-face instructional settings tend to accord the instructor a directive position (Dettori, Giannetti, & Persico, 2006), online environments make it necessary for learners to be more active and responsible for their learning. Additionally, online learners lack the same opportunities to model expected behaviors that students experience in physical classrooms (Cobb, 2003). In general, successful online learners have to be independent and have the ability to manage both their cognitive and metacognitive aspects as well as their affective, motivational states.

Literature indicates that individual differences are significant in online learning experiences (e.g., Dewar & Whittington, 2000; Lee, 2002; Richardson & Newby, 2006; Sullivan, 2001; Williams & Hellman, 2004; Wilson, 2000). Identification of such differences is particularly relevant in teaching adults online as the instructor needs to understand how learner characteristics affect their experience in this new learning mode. In an effort to explore what specific elements make differences in online learners' experience, Hannafin and colleagues (2003) delineated six factors including prior knowledge, metacognition, system knowledge and prior experiences, self-efficacy, learning styles, and motivation. These factors are all related to self-regulated learning (SRL), which further mediates the interactions between learner attributes and the learning environment. Consequently, Hartley and Bendixen (2001) highlighted self-regulatory skills as a crucial learner characteristic in online learning.

Recent research findings further support this extrapolation (see, for example, Bell, 2006; Cobb, 2003; Wang & Lin, 2007; Willem, Aiello, & Bartolome, 2006) and offer insight into the relationship between motivation and SRL of online students. Generally, the findings accord with what has been learned from the classroom settings (e.g., Artino & Stephens, 2006; Chang, 2005; Joo, Bong, & Choi, 2000). Moreover, researchers have found that students' self-

regulation (SR) emerges over the course of online learning (Dell, 2006; Richardson & Newby, 2006), implying the potential of online learning for fostering SRL. More researchers are becoming interested in finding out the utility of embedded interventions such as modeling in promoting SRL in online environments (e.g., Anderson, 2006; Niemi, Nevgi, & Virtanen, 2003; Park, 2003; Yang, 2005-2006).

### **Self-regulation and Modeling**

Modeling is the process whereby observers acquire their thoughts, beliefs, and behaviors through emulating one or more models (Schunk & Zimmerman, 2007). For example, if an online instructor provides quick and helpful responses to student questions at the onset of a course, this sets an example of the expected level of responsiveness for the other participants in a course. From a social cognitive view of self-regulated learning, developing self-regulation through modeling not only promotes students' self-regulatory behaviors directly but also increases their self-efficacy (Bandura, 1986). Self-efficacy, in turn, further strengthens self-regulation as learners gain confidence in themselves and mimic the behaviors of their models. Therefore, models can inform and motivate observers (Schunk, 2001; Schunk & Zimmerman, 2007).

While in traditional classrooms students can model teachers' behaviors through direct observation, online classes do not offer this possibility due to the geographic and temporal separation between one student and the rest of his/her class. However, that does not mean observation and modeling are impossible. After all, various types of educational and social interactions still occur but in different ways. Arguably, there is more of an emphasis on human interactions in learning and teaching processes in online environments (Hill, Wiley, Nelson, & Han, 2004; Romiszowski & Mason, 2004). The difference is that such interactions are realized mostly via text and sometimes images, videos, and voice. Except for explicit instructions on self-

regulatory strategies (Baron, 2007), instructors can model self-regulation through sustained, continuous, and regular participation. For example, planning for the course and specific course activities in advance, making regular course updates, providing feedback in a timely manner, and interacting with students on discussion boards frequently may all appear as regulated behaviors to online students.

The remainder of this paper describes a case in which the instructor promoted self-regulation through course design, modeling, and facilitated students' learning by supporting discrete self-regulatory processes.

### **An E-Learning Evaluation Course Case**

The course was a 16-week course offered as an elective graduate level course for both doctoral and masters students in the Instructional Technology program at a large public university in the southeastern U.S. during the spring and fall semesters of 2008. The course, originally titled "Instructional Product Evaluation," primarily supported student learning by engaging students in the authentic tasks of planning, conducting, and reporting an evaluation for a real world client. It had been delivered for 15 years in a traditional classroom setting where students met each week during a 16 week semester for presentations by the instructor, various learning activities, and group work related to the product evaluation that students planned, conducted, and reported in small teams.

The course instructor had received requests for offering this course from faculty and students at several other universities, and so he decided to develop an online version of the course that would be open to interested students around the world. The course was designed to help students develop an understanding of the theory as well as specific skills related to evaluating technology-based instructional products. The two iterations of the course described in

this paper had eleven and sixteen students respectively. During the first iteration, the students were from six institutions in four countries. In the second iteration, considering the complications caused by large time zone differences during the first iteration, the instructor limited recruitment to students in the North America, and the class eventually had sixteen students. The students in both iterations included mostly full-time graduate students in the field of Instructional Technology and a few full time instructional designers. The course was delivered 100% online asynchronously through Moodle, a free open Course Management System accessible for learners all over the world.

### *Course Design*

This course gave students the opportunities to learn professional knowledge and skills related to evaluation of e-learning or other computer-based instructional products. The structure of the course offered students ample opportunities to share information, work in collaborative groups, discuss content and project related issues, and design, implement, and report their own evaluations.

*Learning Tasks.* When offering the course online for the first time, the central pedagogy remained the same as in the previous face-to-face offerings in terms of the use of authentic learning tasks. The course design was based upon ten key characteristics (Herrington, Reeves, & Oliver, 2006, p. 237):

1. Authentic tasks have real-world relevance.
2. Authentic tasks are ill-defined, requiring students to define the tasks and subtasks needed to complete the activity.
3. Authentic tasks comprise complex tasks to be investigated by students over a sustained period of time.

4. Authentic tasks provide the opportunity for students to examine the task from different perspectives, using a variety of resources.
5. Authentic tasks provide the opportunity to collaborate.
6. Authentic tasks provide the opportunity to reflect.
7. Authentic tasks can be integrated and applied across different subject areas and lead beyond domain-specific outcomes.
8. Authentic tasks are seamlessly integrated with assessment.
9. Authentic tasks create polished products valuable in their own right rather than as preparation for something else.
10. Authentic tasks allow competing solutions and diverse outcomes.

The decision to use real world evaluation projects as the central tasks in the course was based on two considerations. First, the instructor believed that the real knowledge and skills of evaluation could best be acquired through experiential learning. Course projects and practicum experiences have been commonly used in evaluation courses as a major pedagogical strategy (Trevisan, 2004), which all share several of the characteristics of authentic tasks listed above. It is important to help students gain experience in consulting with a real client, doing real field work, producing evaluation products supported by field data, and collaborating with multiple people. Through actively engaging students in problem-solving with realistic situations, the instructor aimed to help students gain knowledge and skills transferrable and applicable to future workplaces. Second, an important goal of the course was to support the self-regulated learning process for students. Authentic tasks are more likely to engage students with their real-life relevance and opportunities for problem-solving, representing diverse perspectives and reflection. The real-life relevance helps students to generate interest, increase task value, and to set goals for learning and application.

In terms of specific task requirements, the enrolled students in the course were expected to plan an evaluation for a real world client, implement the plan, and prepare a final evaluation report with recommendations in teams of 2-4. The projects were often complex enough to involve multiple data collection methods and a fairly heavy workload that should be spread out over the whole semester and among several team members. The evaluation plan and the final report together were worth about 70 percent of the final course grade.

*Course activities.* The instructor intended to provide the opportunities for students to both build a knowledge base about evaluation and carry out a real evaluation in collaborative efforts. In order to be able to do actual evaluations, the students needed to first develop knowledge about various evaluation theories, methods, procedures, and techniques. In helping them gain the explicit knowledge, the instructor provided various readings, including a textbook on e-learning evaluation, an evaluation handbook, a number of case studies, and practice-related articles on various evaluation topics.

The instructor had a lot of expertise from years of evaluation experience, and he desired to share explicit knowledge and insights with his students. While he could talk about something illuminating in his previous face-to-face classes spontaneously with enthusiasm and humor, he felt restricted by the lack of face-to-face interactions with students in the new online version of the course. The technology of narrated PowerPoint presentations partially compensated for this weakness by allowing the instructor to synthesize course readings and share personal perspectives and insights in voice and images. Each week the instructor provided one or more narrated PowerPoint presentations on theoretical and practical topics, supplementing the other course materials and activities in terms of variety and scope.

Online discussions rendered another important approach to enable knowledge construction in this learning community. The students were expected to discuss a topic related to their readings every week. There was also an optional discussion thread where they could bring up any topic of their interest on evaluation, be it theoretical or practical. The sharing of perspectives and opinions on discussion boards allowed the students to compare their own understanding with their peers' as an important avenue to self-evaluation. The learning resources that some students posted provided the whole class with additional helpful information for developing knowledge or enabling successful completion of the authentic evaluation tasks.

*Assessment.* Traditional assessment of learning focuses on the measurement of learning outcomes using tests, exams, and assignments (Reeves, 2000). It is cautioned, however, that solely relying on such summative evaluation methods may neglect many of the important aspects of online teaching and learning (Palloff & Pratt, 1999). For instance, threaded discussion can serve as an indicator of student understanding and reflection, and enable an instructor to provide remediation if needed. Only assessing learning through written exams and papers often gives an incomplete appraisal of learner's learning efforts and gains. Thus, a formative assessment of student performance should be incorporated in online courses.

The inclusion of formative assessment is also meaningful in that it is conducive to maintaining a strong online presence for course participants. Because of the unique features of online education, the virtual classroom lacks the direct sense of presence and the kinds of interactions found in a physical classroom. Use of non-threatening assessment methods in an online course, such as examining online discussions in terms of quantity and quality, providing feedback for student work in progress, and assessing students' contribution to group projects

based on peer evaluation, can help students to participate in both individual and group learning activities continuously. These strategies were applied in this online e-learning evaluation course.

Assessment of authentic tasks emphasizes the meaningfulness of the assessment activities in its own right and their natural connections with what has been taught (Herrington, Reeves, & Oliver, 2010). The main assessment approach associated with the authentic tasks in this course depended on judging the characteristics and usefulness of the final products' (the evaluation plan and final evaluation report). In this course, the students received direct judgment on the usefulness of their evaluation plan when they implemented it at the evaluation site. Similarly, they were able to estimate the value of their final reports in terms how useful their evaluation recommendations could be for their clients. In addition, the final feedback from the instructor provided a comparison of their self-evaluation and the teacher's evaluation of the eventual deliverables. In this sense, the assessment of the authentic tasks was conducive to student reflection and self-evaluation, two integral components of self-regulated learning.

Lastly, although the main evaluation projects carried most of weight in terms of grading reflected collaborative efforts of student groups, there was also a need for assessing individual student's learning. To this end, the course included three quizzes composed of scenario-based long answer questions at different points of the semester to assist the students in connecting the concepts they acquired from course content. Instead of testing the students' memorization of facts and definitions, the quizzes prompted the students to synthesize their knowledge and use critical thinking. The instructor's individualized feedback on these quizzes and questions helped the students to identify their cognitive gaps.

### *Modeling*

Believing that the students can learn from models, the instructor strived to maximize modeling opportunities in his online classroom. The aim was to show a strong instructor presence and convey his way of regulating course participation as an instructor. The instructor's modeling entails three aspects in planning, communication, participation and monitoring.

The instructor modeled planning by (1) setting clear deadlines for evaluation project milestones (deliverables), (2) making all course materials readily available, (3) sharing planning tips for conducting real-life evaluations in narrated PowerPoint presentations, and (4) advising students on how to pace important work in the students' authentic projects. Additionally, since the instructor travelled a lot during the semester, he listed all the travel dates and destinations on course syllabus at the beginning of semester. The students were also informed of an estimation of the extra time in email correspondence during travel. By doing so, he communicated his expectation for the students to handle absences and leaves in the same manner because of the interdependence within students groups.

The second aspect of instructor modeling concerned communication. Communication is critical for online courses due to displacement and the amount of information to be exchanged. There could be more emphasis on effective communication as it was vital for successful completion of the collaborative, authentic evaluation projects. The students were encouraged to use the Moodle course website as a centralized place for their course related activities to improve transparency and efficiency. Moodle offered email features, online discussion subscription features, group wikis, group discussion boards, and chat rooms. In particular, the students were encouraged to share their evaluation plans and reports on group wikis. This, on one hand, supported collaborative editing with available tools and on the other hand, cultivated a culture of

sharing and co-monitoring. In modeling the expected communication mode, the instructor tried to use the Moodle tools as much as possible when he communicated with the whole class. For example, when the course started with an ice-breaking activity on the discussion board, the instructor initiated the discussion by sharing some interesting information about himself and uploading a picture so that everyone knew what their instructor looked like. Moreover, for evaluation project related communication, the instructor copied group members on most of his email correspondence with that group's client, demonstrating professional demeanor and quality in terms of communication.

Students are more likely to care about learning when instructors care about their learning. Further, teacher presence is critical because it has a strong relationship with students' cognitive presence (Garrison, Anderson, & Archer, 2000). It is almost critical that an instructor sustains a high level of participation himself if he expects satisfactory participation and engagement on the learners' part. The instructor in this course made himself visible at the course website through making course announcements in course news forums, periodic responses on discussion boards, and weekly updates summarizing group project progress and online discussions. He also responded very quickly to individual student's questions and requests via email, normally within 24 hours. Course deliverables were turned around in a timely manner so that the groups could use his constructive feedback to quickly continue their projects. The instructor even shared his pictures and activities during his travels for conferences and other business on the course website. These activities sent a signal to the students that he was actively monitoring not only his own course participation but also the students' project and learning progresses as a supervisor, mentor, and teacher.

### *Facilitation*

Facilitation is the key to successful implementation of authentic learning tasks (Woo, Herrington, Agostinho, & Reeves, 2007). More importantly, facilitation is required for supporting the students' self-regulation of their learning processes in an online course to meet the challenges inherent in authentic learning tasks, group work, time constraints, and the complexities of evaluation. In this course, a primary goal for facilitation was to let the students wrestle cognitively rather than logistically. The specific facilitation strategies focused on five aspects of students learning.

First, the course facilitated learning of evaluation through integration of theory and practice. Evaluation is a challenging and complex subject, and the instructor viewed authentic tasks as a primary way of grappling with this complexity. The use of authentic tasks created a context where the students could immediately apply what they learned conceptually. However, to successfully combine theory and practice was not easy. The novice evaluators had to apply evaluation knowledge, skills, techniques, and tools to real projects while they were still learning about them cognitively. To make this process smoother, the course needed to sequence materials and activities to match project progress so that the students could learn and apply their learning synchronously. Meanwhile, the instructor encouraged the students to take risks because trial-and-error is part of the evaluation learning experience. Once students begin to perceive the complexity of evaluation practice, they realize that it is not unusual that something could happen that would prevent evaluators from getting the information necessary to complete the process, resulting in an inability to complete an evaluation or at least delay that process. At these times, the instructor had to intervene by conversing with the client directly as an authority figure to get

things running. The instructor also supported students' learning by providing timely, constructive feedback for their group projects.

Second, the instructor facilitated online discussions by using practical discussion topics that connected to the course evaluation projects. To allow time for continued critical discussion, an online course should also set a deadline for initial postings. To assess discussion participation and quality, the instructor provided a rubric so that the students could understand how to be a better discussant. The discussion board should also cultivate an open but safe culture where students feel free to disagree yet in a respectful manner. The instructor moderated online discussion intermittently to see how students had been doing and if there were issues that needed intervention.

Third, the course facilitated planning and time management. To learn academically in a semester long university course requires planning regarding fulfilling course duties and time allocation during regular weeks. To complete a practical project with quality requires careful planning as well. With the demands from both content learning and authentic evaluation projects in this course, students' planning at a personal and group level could not be more important. The instructor facilitated this process by providing clear academic assignment deadlines (mainly discussion postings and quizzes) and project deadlines. To avoid procrastination or workload buildup due to poor planning, he also guided the students to set interim deadlines within the groups according to specific group project situations. In addition, advice on how to pace important work for evaluation implementation and reporting were offered to the whole class and individual groups.

Fourth, the students needed facilitation with group collaboration. Effective group work is usually difficult to achieve. The authentic projects added to this difficulty as the communication

with clients and evaluation implementation on site required considerable coordination and management. Moreover, not all the students understood how to build positive group dynamics. Considering these factors, the course provided specific guidance to assist student teams in selecting a group leader, reconciling expectations about collaboration and the evaluation project, and organizing regular group meetings. In terms of technology, the students were encouraged to take advantage of various collaborative tools in and outside Moodle, especially collaborative editing tools with record tracking functionality. Whenever group or project issues occurred, the instructor assisted in their resolutions at an early stage. Since group members were dependent upon each other in their collective effort to complete the evaluation projects, it was also recommended that they monitor each other's progress and seek help and resources within the groups through co-regulation.

Fifth, the students received assistance in monitoring. The specific strategies included: (1) encouraging students to review course objectives and check their skills against the evaluation skills inventory towards the end of semester, (2) presenting weekly tasks in an outline format in Moodle, which served as a checklist for students to monitor weekly progress, (3) sending email reminders containing weekly tasks in the middle of each week, (4) checking-in frequently with groups about their projects so that questions, concerns, and issues were addressed in time, (5) posting weekly updates on the group project status and with a summary of online discussions in Moodle, (6) providing individualized and constructive feedback in a timely manner so that students could use to regulate their learning accordingly, (7) turning on online discussion subscription feature to help students follow new postings with ease, and (8) encouraging student use of technology-enhanced monitoring tools, such as programs for project and task management as well as web-based calendars.

### *General Principles for Supporting Self-regulation in Online Courses*

This section synthesizes the practices used to support self-regulation in the case of the E-Learning Evaluation course into three general principles to guide online teaching. The guidelines used in the presented cases above and the following general principles are summarized in Table 5.1.

Table 5.1

*Assess students' knowledge, experience, motivation and learning preferences at the outset.* As mentioned earlier, the characteristics that learners bring to a learning situation differentiate the types of assistance they need to direct their learning processes. It is critically important that the instructor asks the following questions before he can design meaningful and relevant tasks for a targeted student group: Who are the students? What do they need? What are their goals? What are their previous experiences? The instructor may gather such information, using profile documents, surveys, or by other means, to predict and plan the amount and type of support to be provided to individual learners. This also helps the instructor to adjust other elements of the course to accommodate a particular cohort of learners.

*Create a learning context that embeds choices, challenges, and support.* Perceived control and intrinsic motivation are critical for use in self-regulatory strategies (Eshel & Kohavi, 2003; Vollmeyer & Rheinberg, 2006). Provision of tasks or context that allow for learner decision-making regarding what, where, when and how to learn as well as level of challenge, increases learners' autonomy and self-direction in learning. However, it should also be pointed out that support from the instructor or course tutors helps prevent learners from getting lost or overwhelmed by possibilities and uncertainties in a resource-based online learning context (Hill,

2002). Specifically, technical assistance, academic feedback, logistic support, scaffolds and emotional endorsement are all important for online learners.

*Provide opportunities and resources to encourage learning strategy use.* The online instructor first needs to heighten students' self-awareness during learning processes to set the stage for learning strategy use. This may be achieved through encouraging learner reflection by use of a journal, prompted questions, themed discussions, etc. Since self-regulation is teachable (Zimmerman & Risemberg, 1997), an online instructor can enhance the students' self-regulation by offering resources about self-regulatory strategies, embedding strategy instruction in specific course projects, or creating opportunities for learners to share effective strategies to enable modeling. Particularly useful learning strategies for online students include planning, time and resource management, learning environment structuring, progress monitoring, and self-evaluation. The instructors also have a role to play in modeling effective self-regulatory behaviors and strategies.

### **Conclusion**

Many theorists have advocated the positive influences of self-regulation in improving student learning, supported by growing evidence of successful applications of self-regulatory scaffolds in general and those in technology-enhanced learning environments. Nonetheless, some aspects of supporting self-regulation remain unclear, and there is a lack of specific guidelines for implementing such supporting strategies in online courses. Practitioners need more field-tested information from real cases so they can learn from others' successes as well as from their failures. With these cases, practitioners can get a clearer picture of how to go about deliberately promoting self-regulation in specific online course settings regarding course task and activity design as well as facilitation techniques.

The case highlighted in this article and the general principles provide practical guidelines to practitioners, including instructors and instructional designers, who want to learn about and assist their students in becoming more self-regulated learners who can optimize their learning in their online classrooms. The key to fostering self-regulation in this case is to apply strategies that are supportive of student self-regulation in the process of course design and facilitation. Furthermore, instructor modeling of self-regulation through sustained participation and continuous feedback also provides important opportunities for students to emulate. However, more cases involving intentional support for self-regulated learning in online courses are needed to deepen practitioners' understanding and hopefully make such practices more commonplace. It should be noted that the students in this case were full time graduate students and adult professionals. Therefore, the results might differ for traditional undergraduate college students. In any case, if more people will share their practices in achieving online self-regulation, we can all learn to better help the community of online instructors and their students.

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Table 5.1  
*Strategies for Supporting Self-regulation in Online Courses*

Course Design	Learning tasks	<ul style="list-style-type: none"> <li>• Use meaningful and relevant learning tasks</li> <li>• Make learning tasks supportive of self-regulation</li> </ul>
	Course activities	<ul style="list-style-type: none"> <li>• Design a variety of learning activities to complement each other</li> <li>• Encourage knowledge construction and resource sharing through online discussions</li> <li>• Use technology to compensate loss of personal interactions and opportunities to share implicit knowledge</li> </ul>
	Assessment	<ul style="list-style-type: none"> <li>• Use formative, non-threatening assessment</li> <li>• Encourage self-assessment through task design</li> </ul>
Modeling	Model planning	<ul style="list-style-type: none"> <li>• Setting clear deadlines for course deliverables</li> <li>• Making all course materials readily available</li> <li>• Sharing planning tips</li> <li>• Advise how to pace important work</li> </ul>
	Model communication	<ul style="list-style-type: none"> <li>• Model use of course management system tools</li> <li>• Model professional manners for communication</li> </ul>
	Model monitoring	<ul style="list-style-type: none"> <li>• Model participation</li> <li>• Model monitoring of individual and group progress</li> </ul>
Facilitation	Facilitate learning of content	<ul style="list-style-type: none"> <li>• Sequence course materials to match activities and projects</li> <li>• Encourage risk-taking and trial-and-error</li> <li>• Providing timely, constructive feedback for bigger projects</li> <li>• Intervene communication and collaboration with project-related external personnel when necessary</li> </ul>
	Facilitate online discussions	<ul style="list-style-type: none"> <li>• Use practical and meaningful discussion topics to connect with course projects</li> <li>• Set a deadline for initial postings</li> <li>• Provide discussion rubric</li> <li>• Cultivate an open but safe culture</li> <li>• Moderated online discussion intermittently</li> </ul>
	Facilitate planning and time management	<ul style="list-style-type: none"> <li>• Providing clear academic assignment deadlines and project deadlines</li> <li>• Guided the students to set interim deadlines</li> <li>• Advise how to pace important work</li> </ul>
	Facilitate group collaboration	<ul style="list-style-type: none"> <li>• Guide selection of group leaders</li> <li>• Guide group members to reconcile expectations</li> <li>• Encourage use of collaborative tools</li> <li>• Assist organization of regular group meetings</li> <li>• Assist in group issue resolution</li> <li>• Encourage co-regulation</li> </ul>

Table 5.1  
*Strategies for Supporting Self-regulation in Online Courses (continued.)*

Facilitation (continued)	Facilitate monitoring	<ul style="list-style-type: none"> <li>• Encourage students to review course objectives</li> <li>• Present weekly tasks in an outline format</li> <li>• Send email reminders containing weekly tasks</li> <li>• Check in frequently with groups</li> <li>• Post weekly updates</li> <li>• Provide rubrics for assignments and participation</li> <li>• Provided individualized and constructive feedback continuously</li> <li>• Turn on online discussion subscription</li> <li>• Encourage use of technology-enhanced monitoring tools</li> </ul>
General Principles	<ul style="list-style-type: none"> <li>• Assess students' knowledge, experience, motivation and learning preferences at the outset.</li> <li>• Create a learning context that embeds choices, challenge, and support.</li> <li>• Provide opportunities and resources to encourage learning strategy use.</li> </ul>	

## CHAPTER 6

### CLOSING REMARKS

This educational design research (McKenney & Reeves, 2012) effort investigated adult learners' self-regulated learning experience in an asynchronous online "E-Learning Evaluation" course. In keeping with the twin goals of educational design research, the focus of the research was twofold: first, to understand graduate students' self-regulatory processes and strategy use under the influences of the contextual factors in the course and second, to inform improvements in course design and implementation. A collection of articles has been included in this dissertation as follows.

The first paper, *Self-regulated Learning in Online Environments: A Literature Review and Conceptual Model*, aims to conceptualize self-regulated learning in online course environments based on a review of self-regulated learning literature. The paper emphasizes the importance of context for self-regulation and is intended for researchers interested in self-regulated learning in higher education settings. The second paper, *Designing an Online Environment to Support Adults Learning Evaluation by Enhancing Self-Regulation*, presents describes in detail how the online "E-Learning Evaluation" course helped adult students meet the challenges of learning evaluation through embedding design principles that supported self-regulated learning. This paper is intended for other researchers as well as practitioners interested in teaching adults online. The third paper, *Supporting Self-Regulated Learning Online through Course Design, Modeling and Facilitation*, provides a practical example to instructors and

instructional designers who want to support student learning through enhancing their self-regulation in web-based course environments.

Now that my dissertation study has concluded, I have realized the extent and breadth of the knowledge I have gained through the process of conducting this research. First of all, I have gladly discovered that adult learners are strategic and resourceful students, capable of directing and controlling their learning process to the extent they are aware of it and willing to do so. I believe that the self-regulatory processes and strategies the learners used in this unique online course will help them go further in their future endeavors because they clearly understood the learning resources available in the course and perceived how to leverage them as much as they could. Second, it is encouraging to find that the learners' self-regulation was actually influenced by contextual factors in many different ways, indicating great promise for improving online environment design to optimize student learning. The design principles and implementation strategies derived from this study can be useful for teachers and instructional designers in their future practices. Lastly, I learned a great deal about the complex nature of inquiry in education, qualitative analysis, and educational design research in particular. The understanding, skills and techniques about research, and most importantly, the critical thinking I have acquired through this dissertation effort, are my most valuable assets. This has been a long journey with many obstacles, but definitely one of the most rewarding experiences in my life.

## Reference

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APPENDICES

APPENDIX A. INVITATION LETTER FOR STUDENTS INCLUDING COURSE DESCRIPTION



**E-Learning Evaluation: An Online Course**

Professor Thomas C. Reeves

**Introduction:** This online course focuses on the evaluation of e-learning programs such as online and blended courses, web-based training, and performance support systems, both those that are commercially produced and those that an instructor or trainer might develop for his/her own students.

This course has ambitious learning objectives. Participants will have the opportunity to develop knowledge, skills, and attitudes related to topics such as formative and summative evaluation, evaluation models, evaluation planning, survey development, data collection, usability testing, and report preparation. These learning objectives will be achieved through a blend of learning opportunities, didactic, exploratory, and experiential to enable participants to make progress toward becoming a competent evaluator. The emphasis is on the exploratory and experiential rather than the didactic. This is intentional. “Authentic learning” is the primary pedagogical strategy. This pedagogical design is based upon the principles of authentic learning environments as defined by Dr. Jan Herrington of the University of Wollongong:

- Provide an authentic context that reflects how knowledge will be used in real-life.
- Provide authentic activities.
- Provide access to expert performances and the modeling of processes.
- Provide multiple roles and perspectives.
- Support collaborative construction of knowledge.
- Promote reflection to enable abstractions to be formed.
- Promote articulation to enable tacit knowledge to be made explicit.
- Provide coaching and scaffolding at critical times.
- Provide for integrated assessment of learning within the tasks.

**Tasks:** There are three major authentic tasks in this course:

1. Prepare a plan for evaluating an e-learning program for a real client.
2. Implement the evaluation plan.
3. Report the results and recommendations resulting from the evaluation.

**Collaboration:** To complete these tasks, participants will work on a team with two other learners. The participants in this course are expected to be from a variety of countries around the globe including Australia, The Netherlands, Singapore, South Africa, and the USA. Team members are likely to be from two or three different countries because the course will emphasize international collaboration. Likewise, the clients will be international, including higher education instructors, commercial e-learning developers, and representatives of non-profit agencies involved in the development of e-learning environments.

**Learning Support:** The course is being supported with an e-learning environment (developed with Moodle) that includes performance support tools for planning, conducting, and reporting evaluations, essential readings, self-assessment quizzes, online collaboration tools, evaluation resources, templates, examples, and assessment rubrics.

**Timeline:** The course will go live on February 4, 2008 and conclude on May 5, 2008. There will be deadlines for various deliverables throughout the course such as evaluation plans, data collection instruments, interim reports, and the final report.

**Enrollment:** At this time, The University of Georgia does not have an enrollment mechanism for an international collaborative online course of this kind. Therefore, participants will enroll in an appropriate independent study or internship course at their home institutions. The course will be worth 3 semester credits in the U.S. system, and participants should consult with their advisors at their home institution to determine the equivalent credit there. There are no fees associated with this course beyond the local tuition fees that each participant would pay to enroll in an independent study or internship course at his/her home institution. This course will be offered free of charge three times over the next year and half, beginning in February 2008, September 2008, and February 2009. All readings, course materials, task support tools, etc. will be provided without charge.

**Prerequisites:** The course is intended for graduate (postgraduate) students working toward a Masters or Doctoral degree. Participants should have completed at least one instructional design course (or have the experiential equivalent) before enrolling. In addition, a background in basic descriptive statistics is desirable, but not required. English language proficiency is also required.

**Assessment:** Grades in the course will be based on a point system equivalent to 100 points. This will allow conversion of the points into an appropriate grade or mark at the local institution.

**Time Commitment:** Participants should be prepared to invest an average of 12-15 hours per week to this learning experience or around 170-200 hours for the entire 14 week semester. This time commitment is essential to ensure that the ambitious goals of the course are achieved.

**Design Research:** This e-learning evaluation course is part of a design research project carried out by Professor Reeves and a team of graduate students at The University of Georgia. This research project is linked with a larger design research project focused on authentic learning tasks led by Associate Professor Jan Herrington (University of Wollongong), Professor Ron Oliver (Edith Cowan University) and Professor Reeves (UGA). (See: <http://www.authentictasks.uow.edu.au/>) Participants in the course will be invited to participate in this research project by responding to survey and interview questions regarding course design aspects such as group collaboration, self-regulated learning support, and authentic tasks.

**For more information:** Please contact Professor Thomas C. Reeves via email at [treeves@uga.edu](mailto:treeves@uga.edu) with your questions about the course. Thank you.

**UGA Design Research Team:** Professor Reeves, Ms. Eunjung Oh, Ms. Ying Liu, Ms. Rui Hu, Mr. Josh Squires, Mr. Tom Lechner, Ms. Jea Choi, and Ms. Suhwa Lee.

## APPENDIX B. COURSE SYLLABUS AND RUBRICS FOR LEARNING OUTCOMES

## E-Learning Evaluation Course Syllabus

### Course Leader: Thomas C. Reeves, Ph.D.

Professor of Learning, Design, and Technology, Department of Educational Psychology & Instructional Technology,

College of Education, The University of Georgia, 604 Aderhold Hall, Athens, GA 30602-7144 USA

Tel: (706) 542-3849; Fax: (706) 542-4032; E-mail: [treeves@uga.edu](mailto:treeves@uga.edu); WWW:

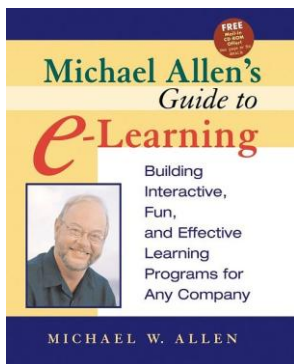
<http://it.coe.uga.edu/~treeves/>

#### Course Facilitator:

Ying Liu  
Ph.D. Student  
The University of Georgia  
Email: [yliu@uga.edu](mailto:yliu@uga.edu)

#### Course Facilitator:

Eunjung Oh  
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The University of Georgia  
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“It would be very surprising if even 10% of organizations using e-learning actually conducted any well-structured and executed evaluations.”

### Introduction

This course focuses on the evaluation of e-learning programs, both those that are commercially produced and those that a college instructor or trainer might develop for his/her own students. Quite frankly, the KSA's (knowledge, skills, and attitudes) of a competent evaluator are so numerous that a single course or even a sequence of courses is inadequate preparation. Instead, disciplined study and extensive practical experience are required before you can develop the technical, communication, and political skills necessary for effective and efficient evaluation.

Despite these limitations, this online course has ambitious goals for providing a blend of learning opportunities, didactic, exploratory, and most importantly experiential to enable you to make progress toward becoming a competent evaluator. The emphasis is decidedly on the experiential rather than the didactic, and perhaps it will seem that you are more responsible for guiding your own learning in this course than in other graduate courses. This is intentional. Above all, we shall pursue "authentic achievement."

## Pedagogy

The pedagogical design of this course is based upon the [principles of authentic learning environments](#) as defined by Dr. Jan Herrington of the University of Wollongong:

- Provide an authentic context that reflects the way the knowledge will be used in real-life
- Provide authentic activities
- Provide access to expert performances and the modeling of processes
- Provide multiple roles and perspectives
- Support collaborative construction of knowledge
- Promote reflection to enable abstractions to be formed
- Promote articulation to enable tacit knowledge to be made explicit
- Provide coaching and scaffolding at critical times
- Provide for integrated assessment of learning within the tasks.

Open and frank communications are encouraged. Feel free to contact Professor Reeves or any of the other course facilitators via e-mail or phone if you have any questions or problems concerning this course. Professor Reeves can be reached via email at: [treeves@uga.edu](mailto:treeves@uga.edu) or by phone at 1-706-542-3849. Open and frank communication will be essential to our collaboration in making this a successful learning experience for all. We'll depend on the Moodle-based course web site as both a vehicle for communications and an environment for learning. The URL for the course web site is: <http://school.coe.uga.edu/>

## Objectives

After completing this course, you should be able to:

1. Generate and refine a definition of evaluation.
2. Develop and defend a rationale for evaluation.
3. Compare and contrast various evaluation "models."
4. Distinguish between/among various concepts such as:
  - a. measurement and evaluation
  - b. criteria for evaluating input, context, process and outcomes of e-learning programs
  - c. intrinsic and extrinsic evaluation
  - d. norm-referenced and criterion-referenced measurement
  - e. formative and summative evaluation
5. Implement various facets of e-learning evaluation:
  - a. review
  - b. needs assessment
  - c. formative evaluation
  - d. effectiveness evaluation
  - e. impact evaluation
  - f. maintenance evaluation
6. Write an evaluation plan for an e-learning program.
7. Evaluate an e-learning program in a practical context.
8. Report your evaluation of an e-learning program.
9. Work with clients to plan, implement, and report an evaluation of an e-learning program.
10. Plan for further development of your evaluation knowledge, skills, and attitudes.

## Tasks

1. You will work with a team of other participants in this course to prepare an evaluation plan for an e-learning program for real clients in an authentic context (worth 20 points).
2. You will work with your team to implement your evaluation plan and prepare an evaluation report for your clients (worth 40 points).
3. You will successfully pass three quizzes (worth 15 points).
4. You will participate fully in the course through discussions, self-assessment, peer assessment, team assessment, and other activities (worth 25 points).

## Assessment

Effort will go a long way in this course. Expect to work hard. Use your imagination and take risks! The amount of yourself you are willing to invest in this course will be directly proportional to how much you will learn in terms of knowledge, skills, and attitudes.



Grades (marks) will be based upon the following points scheme:

Task	Points
1 – Evaluation Plan	20 points
2 – Evaluation Implementation and Report	40 points
3 – Quizzes	15 points
4 – Participation (Self, Peer, and Team Assessments)	25 points

A = 90-100; B = 80-89; C = 70-79; D = 60-69; F = Below 60.

(Grades will be converted to the local marking system at the institution where you are enrolled for credit.)

The rubric for Task 1 can be found in Appendix A.

The rubric for Task 2 can be found in Appendix B.

The rubric for Task 4 can be found in Appendix C.

## We're all in this together!



## Appendix A

**Rubric for Task 1 – Evaluation plan**

Each criterion will be graded on a 10 point scale.

<b>CRITERIA</b>	<b>DESCRIPTION</b>	<b>POINTS</b>
<b>Introduction and Background</b>	A brief orientation to the evaluation context and an overview of the organization of the plan are provided. The evaluand, clients, and evaluators are identified. The reader can understand the nature of the evaluand and the context for the evaluation.	
<b>Purposes</b>	The purposes of the evaluation are delineated clearly, including both formative and summative aspects if they are relevant.	
<b>Stakeholders</b>	Relevant primary and secondary stakeholders in the evaluation are identified.	
<b>Decisions and Questions</b>	The decisions that may be influenced by the evaluation as well as the specific questions addressed by the evaluation are identified. The articulation between decisions and questions is sound.	
<b>Methods</b>	The methods to be used in the evaluation are thoroughly described. Methods are appropriate within the constraints of evaluation resources such as time, budget, and personnel.	
<b>Sample</b>	The participants from whom data will be collected for the evaluation are identified. Participants might include students, teachers, instructional designers, and/or managers. The participants are appropriate to the purposes of the evaluation and the sample size is adequate to questions and methods.	
<b>Instrumentation</b>	The evaluation instruments and tools to be used are described and a rationale for their use is provided. Reliability and validity are addressed. Draft instruments are provided in appendices.	
<b>Limitations</b>	Limitations to the interpretation and generalizability of the evaluation as well as potential threats to the reliability and validity of the design and instrumentation are described.	
<b>Logistics and Time Line</b>	The parties responsible for various aspects of data collection, analysis, and reporting are clarified. Additional information about how the evaluation will be conducted should be included if it is necessary to communicating a clear plan. A reasonable schedule for implementation of the report is planned, including adequate time for analysis and report preparation.	
<b>Budget</b>	An adequate (hypothetical) budget has been allocated for the evaluation. The amount to time required to conduct the evaluation and the fees associated should be estimated.	
<b>TOTAL</b>	POSSIBLE: 100 points	

## Appendix B

**Rubric for Task 2 – Evaluation Report**

Each criterion will be graded on a 10 point scale.

<b>CRITERIA</b>	<b>DESCRIPTION</b>	<b>POINTS</b>
<b>Introduction and Background</b>	A brief orientation to the evaluation context and an overview of the organization of the plan are provided. The evaluand, clients, and evaluators are identified. The reader can understand the nature of the evaluand and the context for the evaluation. (Screen captures and other graphics may be used to clarify the nature of the evaluand.)	
<b>Purposes and Stakeholders</b>	The purposes of the evaluation are delineated clearly. The primary and secondary stakeholders for the evaluation are identified.	
<b>Decisions and Questions</b>	The decisions that may be influenced by the evaluation as well as the specific questions addressed by the evaluation are identified. The articulation between decisions and questions is clear.	
<b>Methods</b>	The methods used in the evaluation are thoroughly described. Methods are appropriate within the constraints of evaluation resources such as time, budget, and personnel. (A matrix may be used to illustrate the relationships between questions and methods.)	
<b>Instrumentation</b>	The evaluation instruments and tools used in the evaluation are described and a rationale for their use is provided. Reliability and validity are addressed. Sample instruments are in appendices.	
<b>Limitations</b>	Limitations to the interpretation and generalizability of the evaluation as well as potential threats to the reliability and validity of the design and instrumentation are described.	
<b>Analysis</b>	Data processing and analysis processes are described. Analysis adhered to the guidelines of the particular methods used. Appropriate data synthesis strategies and statistics are used.	
<b>Results</b>	The results are presented in a clear and coherent manner. Tables and figures are used appropriately.	
<b>Discussion</b>	Informative discussion of the results is provided.	
<b>Recommendations</b>	Feasible recommendations appropriate to the clients' needs are made.	
<b>TOTAL</b>	POSSIBLE: 100 points	

## Appendix C

**Rubric for Task 4 – Participation**

(Additional rubrics for self and peer assessment will be disseminated later.)

## Excellent (90 - 100 points)

- The participant consistently posted insightful comments and questions that prompted additional on-topic discussion among the seminar participants.
- The participant consistently helped clarify or synthesize other group members' ideas.
- If disagreeing with another participant's ideas, the participant stated disagreements or objections clearly, yet politely.

## Good (71 - 89 points)

- The participant was sometimes lacking in one or two of the items listed for "Excellent" level participation.
- The participant sometimes had to be prompted or coaxed to participate.
- The participant usually, but not always, expressed herself or himself clearly.

## Below Expectations (61 - 70 points)

- The participant was often lacking in three or more of the items listed for "Excellent" level participation.
- The participant often had to be prompted or coaxed to participate.
- The participant rarely expressed herself or himself clearly.

## Failure (0 - 60 points)

- The participant was often lacking in all of the items listed for "Excellent" level participation.
- The participant was extremely reluctant to participate, even when prompted.
- The participant was rude or abusive to other course participants.

## APPENDIX C. SAMPLE INTERVIEW PROTOCOLS

## &lt;Student Interview Protocol&gt;

**First Interview:**

1. In general, how do you feel about learning online? Compared to your previous courses, do you feel the same about this learning experience?
2. What are your motivation/goals for taking this course?
3. How do you think about the course tasks' usefulness for achieving your goal?
4. To what extent do you feel confident about achieving your goal?
5. Do you experience difficulty in managing your time or fulfilling course requirements? If so, how did you motivate yourself? How did you cope with the difficulties?
6. Show me how you went about completing last week's module - from start to finish.
7. Have you taken any notes or kept any written records? If so, can you explain how you go about doing that and show me some example?
8. How do you organize your course materials and activities for this course?
9. Studying alone in an online environment can be very challenging. Have there been any obstacles or challenges to you? If yes, explain how you coped with them.
10. Have there been any new obstacles or challenges to you? If yes, explain how you coped with them.

**Second Interview:**

1. How has your motivational/emotional states changed so far?
2. Describe the typical place where you work on the course. Did you need to do anything to make the environment a good place to work? What changes have you made in the work environment?
3. Describe the methods you used to complete the course readings last week.
4. Describe the methods you used to participate in the course discussions last week.
6. How do you go about identifying and choosing the resources you need for the class assignments/projects? What help was provided during this process?
7. Did you seek help from anyone while completing the last few modules? If yes, please explain from whom and why.
8. In what ways did monitor your (as an individual and a group member) progress in this course?
9. How did your team evaluate your work? How did you gauge your own learning?
10. What types of feedback you've got so far?
11. How did you feel about the work load? How did you react to that?
12. What strategies have you used to work with others, including your peers and instructor?
13. How have learning in a group affected your (way of) individual learning?
14. Have there been any new obstacles or challenges to you in this course so far? If yes, please explain what strategies you have used to cope with these challenges.
15. How can we support your learning?

**Third Interview:**

1. This course is featured by authentic tasks and collaborative work, which might be different from your other courses. Compared to the course without these features, do you feel more, less or equally successful in this course? Explain.
2. Is the content difficult for you?
3. Compared to the course without these features do you feel any difference in your role as a learner in this course? Explain.
4. Now that you have completed the course, how do you feel about (this type of) course?
5. To what extent do you think you have met your initial goals/objectives for this course? Are you satisfied with your own learning result?
6. Compare to your other courses, did you feel any difference in how you control your learning? (Did you feel more or less regulated in this course)?
7. Do you think the way you regulated your own learning process something you bring to this course or something growing out of this course?
8. Has there been any change in your confidence about achieving your initial goals over the course period? If so, please explain.
9. Has your level of motivation changed over the course of the semester? If so, please explain.
10. What strategies have you used to motivate yourself?
11. Did you engage in any goal-setting or planning as you progressed through this course (both as an individual and as a team member)?
12. How did you monitor your learning process?
13. To what extent do you reflect on your performance during this course?
14. To what extent have you tried to assess your own work/learning? How? How does your own evaluation compare to the instructor's?
15. Do you think the course has helped you assess your own learning adequately? Explain.
16. What factors have influenced your individual learning process? And how?
17. Looking back, what have been the challenges for your individual learning? How have you overcome the challenges?

18. Have the course instructor and the facilitators helped you to resolve those challenges? Have you asked for any help?
19. What in this course has assisted your own learning process?
20. Based on your experience, what do you think are the critical factors of a successful online learning environment for evaluation?
21. To better learn about evaluation, what support have you received from the course design, the instructor, and your classmates during the course? What kinds of support do you expect to receive for a successful online learning experience?
22. What advice do you have for students who will take this course next semester regarding self-regulation in this class?

**<Instructor Interview Protocol>****After the semester (after finishing grading)**

1. You designed a course with authentic tasks and collaborative work opportunity. What were the considerations when you designed this kind of learning environment?
2. When you designed those kinds of task, how did you expect the students to be influenced?
3. Overall, what do you think about the course this semester?
4. What do you think of the quality of students' evaluation projects outcome this semester?
5. What was the biggest challenge or issues for you as an instructor in this semester?
6. In your opinion, what was the biggest challenge for students in this semester?
7. Could you comment on each student's performance in relation to the assignments and projects?
8. What do you consider to be the effective facilitation strategies in this class?
9. What did you learn from this iteration of the online course?
10. What should we as a project team improve for the next semester to better support students?

## APPENDIX D. SAMPLE SURVEY INSTRUMENTS

## &lt;Evaluation Skills Inventory&gt;

Please take a few minutes to complete the pre-assessment for the "E-Learning Evaluation" course which you are about to begin. Please rate your knowledge and skills related to evaluation with respect to the following items using the 0-10 scale provided:

1. Interpret research and evaluation reports as reported in the professional literature.
2. Write a comprehensive literature review.
3. Interact with evaluation clients in a face-to-face context to obtain the information you need for evaluation planning.
4. Interact with evaluation clients in an online context to obtain the information you need for evaluation planning.
5. Prepare an evaluation plan.
6. Incorporate a specific "evaluation model" into your evaluation plan.
7. Conduct a needs assessment.
8. Develop a questionnaire for a program evaluation.
9. Develop an interview protocol for a program evaluation.
10. Develop a focus group protocol for a program evaluation.
11. Conduct a heuristic evaluation of an e-learning program.
12. Conduct a usability test of an e-learning program.
13. Use expert review as an evaluation strategy.
14. Conduct an online survey using software such as [SurveyMonkey](#) or [QuestionPro](#).
15. Understand the principles of descriptive statistical analysis.
16. Apply the principles of descriptive statistical analysis.
17. Understand the principles of inferential statistical analysis.
18. Apply the principles of inferential statistical analysis.
19. Implement an evaluation plan.
20. Prepare an evaluation report.

Non-existent

Expert

0 1 2 3 4 5 6 7 8 9 10

21. Please list any other knowledge and skills you have that you believe we should know about in the context of this "E-Learning Evaluation" course.

Your responses are very helpful for planning and facilitating this course. Thank you for your time!

## &lt;Student Profile Survey&gt;

Please complete this online survey at your earliest convenience. This information will provide the "E-learning Evaluation" course instructor with background information that will enable him to work with you more effectively. Thanks!

1. Your name:
2. Age:  
18-25 / 26-35 / 36-45 / 46-60 / 61 or older
3. Gender: F or M
4. Your area of study:
5. What degree are you pursuing?  
Masters / Doctoral / Other
6. How many online courses have you taken previously?
7. Please rate your technology skills on a scale ranging from 0 (non-existent) to 10 (expert), especially in the context of an online course.

Non-existent

Expert

0 1 2 3 4 5 6 7 8 9 10

8. If you have previous experience with online courses, what were the most positive aspects of that learning experience?
9. If you have previous experience with online courses, what were the most challenging aspects of that learning experience?
10. Have you had any group work or projects in online course? Yes or No
11. If you had group work or projects in online courses, what kinds of activities did you do?
12. Please rate your groupwork experience, from 0 (negative/unsuccessful) to 10 (positive/successful).

Negative/unsuccessful

Positive/successful

0 1 2 3 4 5 6 7 8 9 10

13. What is your motivation to take this course?
14. What are your expectations for this course?
15. Please rate your confidence in doing well in this course from 0 (very low) to 10 (very high).

Very low

Very high

0 1 2 3 4 5 6 7 8 9 10

16. Do you have any needs, concerns or considerations that your instructor should be made aware of?

This information will be very useful. Thank you for your input!

### <Assessment of Evaluation Planning Process>

We would like to know your evaluation of the evaluation planning process thus far and would like to support you more in the future activities. Your answers to the questions below will be greatly appreciated. Thank you.

Your evaluation of the evaluation planning process thus far:

1) Please rate your overall satisfaction with the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

2) Please rate your satisfaction with your own contributions to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

3) Please rate your satisfaction with the contributions of your other team members to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

4) Please rate your satisfaction with the contributions of your clients to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

5) Please rate your satisfaction with the contributions of the course facilitators to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

6) What questions, requests, or comments do you have for the course facilitators?

### <Assessment of Evaluation Planning Process>

We would like to know your evaluation of the evaluation planning process thus far and would like to support you more in the future activities. Your answers to the questions below will be greatly appreciated. Thank you.

Your evaluation of the evaluation planning process thus far:

1) Please rate your overall satisfaction with the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

2) Please rate your satisfaction with your own contributions to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

3) Please rate your satisfaction with the contributions of your other team members to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

4) Please rate your satisfaction with the contributions of your clients to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

5) Please rate your satisfaction with the contributions of the course facilitators to the evaluation planning process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

6) What questions, requests, or comments do you have for the course facilitators?

**<Assessment of Evaluation Data Collection Process>**

We would like to know your evaluation of the evaluation data collection process thus far and would like to support you more in the future activities. Your answers to the questions below will be greatly appreciated. Thank you.

Your evaluation of the evaluation data collection thus far:

1) Please rate your overall satisfaction with the evaluation data collection process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

2) Please rate your satisfaction with your own contributions to the evaluation data collection process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

3) Please rate your satisfaction with the contributions of your other team members to the evaluation data collection process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

4) Please rate your satisfaction with the contributions of your clients to the evaluation data collection process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

5) Please rate your satisfaction with the contributions of the course facilitators to the evaluation data collection process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

6) What questions, requests, or comments do you have for the course facilitators?

**<Assessment of Evaluation Report Writing Process>**

We would like to know your evaluation of the evaluation report writing process thus far and would like to support you more in the future activities. Your answers to the questions below will be greatly appreciated. Thank you.

Your evaluation of the evaluation report writing thus far:

1) Please rate your overall satisfaction with the evaluation report writing thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

2) Please rate your satisfaction with your own contributions to the evaluation report writing process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

3) Please rate your satisfaction with the contributions of your other team members to the evaluation report writing process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

4) Please rate your satisfaction with the contributions of your clients to the evaluation report writing process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

5) Please rate your satisfaction with the contributions of the course facilitators to the evaluation Report writing process thus far:

Unsatisfied 1 2 3 4 5 6 7 8 9 10 Satisfied

Any comments? (Optional):

6) What questions, requests, or comments do you have for the course facilitators?

**<Peer Evaluation>**

Section I. Please rate EACH of your team members using the following scale.

**ATTITUDES**

Shows little interest in learning.	1 2 3 4 5	Shows interest or enthusiasm for learning.
Not interested in working to improve performance.	1 2 3 4 5	Aware of deficiencies and actively tries to improve; needs little encouragement from others.
Consistently seems unprepared for sessions.	1 2 3 4 5	Consistently well-prepared for sessions.
Does not accept responsibility for own learning.	1 2 3 4 5	Accepts responsibility for own learning.

**GROUP PROCESSES**

Reluctant to take on work and responsibilities.	1 2 3 4 5	Willing to take on assignments and responsibilities.
Passive participation in group learning.	1 2 3 4 5	Active participation in group learning.
Shows lack of respects for viewpoints and feelings of others	1 2 3 4 5	Considerate of group members. Shows respect and sensitivity to the viewpoints and feelings of others.
Unwilling (or shows difficulty) to negotiate when disagreements or conflicts in group arise.	1 2 3 4 5	Identifies misunderstanding and helps to resolve conflicts between self and others in groups.
Deficiencies in communicating with peers.	1 2 3 4 5	Skillful in communicating with peers.
Deficiencies in professional behavior.	1 2 3 4 5	Highly developed professional behavior.

**COGNITIVE PROCESSES**

Shows difficulty acquiring and interpreting information.	1 2 3 4 5	Adequately acquires and interprets information.
Contributes little to group's knowledge construction.	1 2 3 4 5	Make important contributions to group's knowledge construction.
Deficient in critical thinking.	1 2 3 4 5	Highly skilled in critical thinking.

Section II. Give a concrete summary of each team member's contributions to the project. (such as common activities that everybody contributed and personal contribution that an individual contributed) along with a numeric rating on a scale from 1 to 5.

<b>Group member 1</b>	
Common activities	
Personal contribution	
<b>Group member 2</b>	
Common activities	
Personal contribution	
<b>Group member 3</b>	
Common activities	
Personal contribution	

Section III. Please add any comments (for example, strengths and weaknesses) about the persons you are evaluating.

### <Self Evaluation>

1. Describe your individual role on the project you just completed. What tasks did you do, and about how much time did you spend doing them?

2. Evaluate your own contribution to the project on a scale from 1 to 5.

3. What have you learned about evaluation? Please put "x" mark on what you have learned.

- Generate and refine a definition of evaluation. (      )
- Develop and defend a rationale for evaluation. (      )
- Compare and contrast various evaluation "models." (      )
- Distinguish between/among various concepts such as:
  - measurement and evaluation (      )
  - criteria for evaluating input, context, process and outcomes of e-learning programs (      )
  - intrinsic and extrinsic evaluation (      )
  - norm-referenced and criterion-referenced measurement (      )
  - formative and summative evaluation (      )
- Implement various facets of e-learning evaluation:
  - Review (      )
  - needs assessment (      )
  - formative evaluation (      )
  - effectiveness evaluation (      )
  - impact evaluation (      )
  - maintenance evaluation (      )
- Write an evaluation plan for an e-learning program. (      )
- Evaluate an e-learning program in a practical context. (      )
- Report your evaluation of an e-learning program. (      )
- Work with clients to plan, implement, and report an evaluation of an e-learning program. (      )
- Plan for further development of your evaluation knowledge, skills, and attitudes. (      )

4. To what extent have you achieved what you wanted to achieve?

5. How do you think about yourself as a team member? (You may refer to the criteria described in peer evaluation form.)

## APPENDIX E. WEEKLY ACTIVITIES OUTLINE

**EDIT 8350 E-Learning Evaluation Fall 08** You are logged in as Ying Liu (Logout)

school ► EvalFall08 Switch role to... Turn editing on

**People**

Participants

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**Activities**

Chats  
Forums  
Quizzes  
Resources  
Wikis

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**Search Forums**

Go  
Advanced search

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**Administration**

Turn editing on  
Settings  
Assign roles  
Grades  
Groups  
Backup  
Restore  
Import  
Reset  
Reports  
Questions  
Files  
Profile

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**Course categories**


Dr. Choi  
Dr. Reeves  
Dr. Orey  
Dr. Branch  
Research  
All courses ...

**Weekly outline**

- Course news forum
- Moodle Survival Guide
- Chat-space
- [Evaluation Groupwork Forum] Group 1
- [Evaluation Groupwork Forum] Group 2
- [Evaluation Groupwork Forum] Group 3
- [Evaluation Groupwork Forum] Group 4
- [Evaluation Groupwork Forum] Group 5
- Group 1 Wiki
- Group 2 Wiki
- Group 3 Wiki
- Group 4 Wiki
- Group 5 Wiki

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18 August - 24 August



to Week 1, everyone!

Please complete the following activities:

1. Review the Course Syllabus
2. View this narrated PowerPoint presentation [Welcome to the Course](#)
3. Introduce yourself and participate in Ice-breaking activity in Ice-Breaking Activity Forum
4. Read Chapter 1 from Course Textbook
5. Read Case Study 1
6. Read Introduction and Section I from 2002 User-Friendly Handbook for Project Evaluation
7. View this narrated PowerPoint presentation about "Paradigms" (Reference list for this presentation)
8. Respond to [Question of the Week](#) in Week 1 Learning Forum
9. Participate in Week 1 Discussion

- Welcome to the course PPT
- Articulate PPT on Paradigms
- Reference List for "Evaluation Paradigms" PPT
- pdf of Week 1 Paradigms PPT Slides
- Ice-breaking Activity Forum
- Question of the Week - Week 1
- Week 1 Discussion
- Course Text : E-Learning Evaluation by Reeves & Hedberg

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25 August - 31 August

Please complete the following activities for Week 2:

1. Watch the movie about Wiki
2. Review:
  - a. 7 things you should know about Wikis,
  - b. 7 things you should know about virtual meetings, and
  - c. 7 things you should know about collaborative editing
3. Review your team assignment and [Meet](#) online with your team-mates using both synchronous and asynchronous tools. Decide on a Name for your team, e.g., "SuperEvaluators"
4. Pick a team leader
5. Read Chapter 2 from Course Textbook

**Latest News**

Add a new topic...

14 Dec, 12:57  
Thomas Reeves  
[Final Weekly Update more...](#)

1 Dec, 21:01  
Thomas Reeves  
[Week 16 Update more...](#)

24 Nov, 18:30  
Thomas Reeves  
[Week 15 Update more...](#)

17 Nov, 10:09  
Thomas Reeves  
[Week 14 Update more...](#)

11 Nov, 12:28  
Thomas Reeves  
[Week 13 Update more...](#)

[Older topics ...](#)

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**My Course Mail**

[Check Mail](#)

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**Calendar**

June 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

**Events Key**

Global Course  
Group User

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**Recent Activity**

Activity since Monday, 20 June 2011, 12:33 PM

[Full report of recent activity...](#)

Nothing new since your last login







5. Read [Chapter 2](#) from Course Textbook
6. Read [Case Study 2](#)
7. Read [Section II](#) from 2002 User-Friendly Handbook for Project Evaluation
8. View the narrated PowerPoint presentation about "Evaluation Models" ([Reference list for this presentation](#))
9. Respond to [a Question of the Week](#) in Week 2 Learning Forum
10. Participate in [Week 2 Discussion](#)

-  [PPT on Evaluation Models](#)
-  [pdf of Week 2 "Models" PPT slides](#)
-  [References for Week 2 "Evaluation Models" PPT](#)
-  [Question of the Week - Week 2](#)
-  [Week 2 Discussion](#)

1 September - 7 September

Please complete the following activities for Week 3:





1. Read [Chapter 3](#) from Course Textbook
2. Read [Case Study 3](#)
3. Read [Section III](#) from 2002 User-Friendly Handbook for Project Evaluation
4. View the narrated PowerPoint presentation about "Six Facets of Instructional Product Evaluation" ([Reference list for this presentation](#))
5. View the narrated PowerPoint presentation about "Meeting Your Client"
6. Respond to [a Question of the Week](#) in Week 3 Learning Forum
7. Participate in [Week 3 Discussion Forum](#)

-  [PPT on 6 facets of Instructional Product Evaluation](#)
-  [PPT on First Client Meeting](#)
-  [pdf of Week 3 "Six Functions" PPT slides](#)
-  [References for Week 3 "Six Functions" PPT](#)
-  [Question of the Week - Week 3](#)
-  [Week 3 Discussion](#)

8 September - 14 September

Please complete the following activities for Week 4:

1. Collaborate with your team members in "meeting" with your client(s) to begin evaluation planning.
2. Read [Chapter 4](#) from Course Textbook
3. Read [Case Study 4](#)
4. Read [Section IV](#) from 2002 User-Friendly Handbook for Project Evaluation
5. Read [Hints for Designing Effective Questionnaires](#) by Robert B. Frary
6. View the narrated PowerPoint presentation about "Survey Design"
7. Respond to [a Question of the Week](#) in Week 4 Learning Forum
8. Participate in [Week 4 Discussion Forum](#)

-  [PPT on Survey Design](#)
-  [pdf of week 4 "Survey Design" PPT slides](#)
-  [Question of the Week - Week 4](#)
-  [Week 4 Discussion](#)

15 September - 21 September

Please complete the following activities for Week 5:


1. Submit evaluation plan outline to Professor Reeves that includes the following:
  1. Brief description of product or program being evaluated
  2. Decisions that the evaluation will address
  3. One or more questions associated with each decision
  4. Ideas about possible methods
2. Read [Chapter 5](#) from Course Textbook
3. Read [Case Study 5](#)

4. View the narrated PowerPoint presentation about "Heuristic Review"
5. View first "Online Survey" Tutorial
6. Respond to [Question of the Week](#) in Week 5 Learning Forum
7. Participate in Week 5 Discussion Forum

 [PPT on Heuristic Review](#)

 [pdf of Week 5 "Heuristic Review" slides](#)

 [Question of the Week - Week 5](#)

 [Week 5 Discussion](#)

22 September - 28 September

Please complete the following activities for Week 6:

1. Submit draft evaluation plan for review by Professor Reeves (see Evaluation Plan Rubric in [course syllabus](#)).
2. View the narrated PowerPoint presentation about the [Air Force Academy Case Study](#) (Note: This presentation requires the use of Internet Explorer as a browser.)
3. Read [Chapter 6](#) from Course Text
4. Read [Case Study 6](#)
5. Read [How to Conduct a Heuristic Evaluation](#) by Jakob Nielsen
6. Respond to [Question of the Week](#) in Week 6 Learning Forum
7. Participate in Week 6 Discussion Forum

 [Question of the Week - Week 6](#)


 [Week 6 Discussion](#)

29 September - 5 October


Please complete the following activities for Week 7:

1. Submit second draft evaluation plan to Professor Reeves for review as soon as possible.
2. Read [Chapter 7](#) from Course Text
3. Read [Case Study 7](#)
4. View the narrated PowerPoint presentation about the [Usability Testing](#)
5. View this video tour of the "E-Learning Usability Testing Lab" at Tamkang University in Taiwan. (This video is narrated in Chinese, but you can use this [English translation](#) to guide you through it.) Some of the graduates from our doctoral program at UGA work at TKU.
6. View this "Paper Prototype Usability Test" video.
7. Just for fun, you might want to look at this video about "How NOT to do a usability test"
8. Respond to [Question of the Week](#) in Week 7 Learning Forum
9. Participate in Week 7 Discussion Forum

 [pdf of Week 7 "Usability Testing" PPT slides](#)

 [Additional resources about e-learning evaluation](#)

 [Question of the Week - Week 7](#)

 [Week 7 Discussion](#)


6 October - 12 October

Please complete the following activities for Week 8:

1. As you finalize your evaluation plans, the biggest challenge you face may be developing the instruments such as questionnaires, interview protocols, usability test protocols, etc. You can find some sample data collections instruments at this [Tools](#) website.
2. Your client should receive and sign off on a final copy of the evaluation plan this week. Here is an example of a [Sign-Off Form](#).
3. In lieu of a narrated PowerPoint presentation this week, I would like those of you who need it to develop or refresh your knowledge of basic statistical concepts by going through the first two chapters of this [HyperStat Online Statistics Textbook](#) (1. Introduction to Statistics and 2,

- Describing Univariate Data).
4. Read [Chapter 8](#) from Course Text
  5. Read [Case Study 8](#)
  6. Respond to ["Question of the Week"](#) in Week 8 Learning Forum
  7. Participate in [Week 8 Discussion Forum](#)

 [Question of the Week - Week 8](#)

 [Week 8 Discussion](#)

13 October - 19 October


Please complete the following activities for Week 9:

1. Continue working with your team members and clients on your evaluation project
2. Read [Chapter 9](#) of the Course Text
3. Read (not necessarily word for word) [Evaluating Online Learning Challenges and Strategies for Success](#) from the U.S. Department of Education
4. Review this [sample evaluation report](#) by Walton, Chen, & Wang.
5. View the narrated PowerPoint presentation about the ["Enhancing Surveys"](#)
6. Look at these two guides about [Types of Survey Questions](#) and [Survey Scales](#) from the University of Texas
7. Respond to ["Question of the Week"](#) in Week 9 Learning Forum
8. Participate in [Week 9 Discussion Forum](#)

 [PPT on Enhancing Surveys](#)


 [pdf of Week 9 "Enhancing Surveys" PPT slides](#)

 [Question of the Week - Week 9](#)


 [Week 9 Discussion](#)

20 October - 26 October

Please complete the following activities for Week 10:

1. Continue working with your team members and clients on your evaluation project - Hopefully, your client has approved your evaluation plan by now and your team is beginning to collect data - Please let your course instructor know when you need help.  
2. View the narrated PowerPoint presentation about the ["Data Analysis - Part I"](#)
3. Read: [Pitfalls of Data Analysis](#)
4. Respond to ["Question of the Week"](#) in Week 10 Learning Forum (Imagine being the first person to post this week rather than the last? You can do it.)
5. Participate in [Week 10 Discussion Forum](#)


 [pdf of Week 10 Data Analysis Part I PPT slides](#)

 [Question of the Week - Week 10](#)

 [Week 10 Discussion](#)

27 October - 2 November

Please complete the following activities for Week 11:

1. Continue working with your team members and clients on your evaluation project and don't forget to let your course instructor know when you need help.  
2. View the narrated PowerPoint presentation about the ["Data Analysis - Part II"](#)
3. This resource shows an examples of how to code qualitative data: [Qualitative Data Analysis](#) . This resource is based upon this book: [Johnson, B., & Christensen, L. Educational research: Quantitative, qualitative, and mixed approaches \(3d ed.\). Thousand Oaks , CA: Sage Publications.](#) (This resource replaces a resource posted earlier which has disappeared from the Web!)
4. Respond to this ["Question of the Week"](#) in Week 11 Learning Forum

4. Check out this [list of Quantitative Data Analysis software](#)
5. Respond to [Question of the Week](#) in Week 11 Learning Forum
6. Participate in [Week 11 Discussion Forum](#)

 [pdf of Week 11 Data Analysis Part 2 PPT slides](#)

 [Question of the Week - Week 11](#)

 [Week 11 Discussion](#)

3 November - 9 November

Please complete the following activities for Week 12:

1. Continue evaluation project collaboration
2. Read "Evaluating What Really Matters In Computer-Based Education" by Professor Reeves paper
3. View "Ethical Issues In Evaluation" PPT Presentation
4. Access the [Guiding Principles for Evaluators](#) website
5. Respond to [Question of the Week](#) in Week 12 Learning Forum
6. Participate in [Week 12 Discussion Forum](#)

 [pdf of Week 12 Ethical Issues PPT slides](#)

 [Question of the Week - Week 12](#)

 [Week 12 Discussion](#)

10 November - 16 November

Please complete the following activities for Week 13:

1. Continue evaluation project collaboration with your team and your client
2. If you have pieces of a draft report you want review, please send them to Professor Reeves
3. View narrated PowerPoint presentation about "Reports and Recommendations"
4. Respond to [Question of the Week](#) in Week 13 Learning Forum
5. Participate in [Week 13 Discussion Forum](#)

 [Question of the Week - Week 13](#)

 [Week 13 Discussion](#)

 [pdf of Week 13 Evaluation Report PPT slides PDF document](#)

 [Narrated PPT on Evaluation Reports and Recommendations](#)

17 November - 23 November

Please complete the following activities for Week 14:

1. Ideally, submit first draft of evaluation report for review by Professor Reeves
2. Continue evaluation project collaboration
3. Take this [Quiz about Paradigms](#)
4. Respond to [Question of the Week](#) in Week 14 Learning Forum
5. Participate in [Week 14 Discussion Forum](#)

 [Quiz 1 Question: Do you know your paradigms?](#)

 [Question of the Week - Week 14](#)

 [Week 14 Discussion](#)

24 November - 30 November






Week 15- No class assignments this week because of Thanksgiving Week Break

1 December - 7 December

Please complete the following activities for Week 16:

1. Each team should try to submit a draft evaluation report to Professor Reeves sometime this week, but it is understood that this may not be feasible for all teams. Feedback on draft reports will be turned around within 24 hours or less.
2. Take [Quiz 2 "Do you know your evaluation terminology?"](#) (worth 5 points)
3. Take [Quiz 3 "Do you know your evaluation functions?"](#) (worth 5 points)
4. Respond to ["Question of the Week"](#) in Week 16 Learning Forum
5. Participate in Week 16 Discussion Forum


-  [Quiz 2 "Do you know your evaluation terminology?"](#)
-  [Quiz 3 "Do you know your evaluation functions?"](#)
-  [Question of the Week - Week 16](#)
-  [Week 16 Discussion Forum](#)

8 December - 14 December

1. Please submit final evaluation report to Dr. Reeves by Friday, December 12, at 5 PM. This assumes at least one round of formative review of a draft report. After assessment, Dr. Reeves will advise each team regarding dissemination of the report to the team's client.
2. Participate in Week 17 Discussion Forum
3. Complete online course evaluation instrument.

**HAPPY HOLIDAYS**

 [Week 17 Discussion Forum](#)

 [Moodle Docs for this page](#)

You are logged in as [Ying Liu](#) (Logout)

[Home](#)