LEARNING STRATEGIES FOR SUCCESS IN A WEB-BASED COURSE A Descriptive Exploration

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Web-based distance instruction has become a popular delivery method for education. How are learning strategies helping make the connection between Web-based technologies and educational goals? The purpose of this study was to examine learners' use of self-regulated learning strategies in a Web-based course. Twelve students from an information studies online course participated in a semistructured survey about their learning strategies. The content analysis of the survey responses revealed that self-regulated learning strategies in traditional situations could be identified in students' online learning. Participants' responses also indicated that they considered goal-setting/time- or effort-management and cognitive strategies the most helpful ones for them to perform successfully in the course. This article may offer insights to instructors and designers of the distance learning environment, and also provide suggestions for future research.

In Web-based distance education courses, individuals are able to participate at their convenience with little to no supervision. The learner control inherent in these courses is usually considered a positive feature to enhance motivation (Reeves, 1993). However, research has shown that learner control is associated with a number of negative outcomes, such as less time spent on task and the use of poor learning strategies (Brown, 2001; Williams, 1993). Another factor, learners' self-regulation, is a powerful predictor for their academic achievement (Ley & Young, 1998; Pintrich & Groot, 1990), and it also has a positive effect on learners' motivation (Kitsantas, Reiser, & Doster, 2003; Lan, 1996; Schunk, 1996; Zimmerman & Kitsantas, 1996). New learning environments, such as Web-based instruction, require proactive and active learning to construct knowledge and skills. Schunk & Zimmerman (1998) mentioned distance education as an area that lends itself well to self-regulation. They claimed that "self-regulation seems critical due to the high degree of student independence deriving from the instructor's physical absence" (p. 231). Therefore, a number of

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The Quarterly Review of Distance Education, Volume 10(2), 2009, pp. 123–134 ISSN 1528-3518 Copyright © 2009 Information Age Publishing, Inc. All rights of reproduction in any form reserved. researchers (Keller, 1999; McMahon & Oliver, 2001; Zimmerman, 2000) have proposed utilizing self-regulatory strategies to promote online learners' motivation and understanding. Studies that address the use of self-regulated learning strategies in Web-based courses, however, are limited (Whipp & Chiarelli, 2004). The present study was designed to preliminarily explore learners' use of self-regulated learning strategies in an online environment.

THEORETICAL FRAMEWORK

Self-Regulated Learning (SRL)

Over the last decade, learners' self-regulation of their cognition, motivation, and behaviors to promote academic achievement has been a topic of increasing interest in the field of education (Bandura, 1986; Schunk, 1996; Zimmerman, 1990, 1998). Driscoll (2000) refers to self-regulation as skills that learners use to "set their own goals and manage their own learning and performance" (p. 304). Zimmerman (1990) defines self-regulated learning with three distinctive features: learners' application of self-regulated learning strategies, their sensitivity to self-evaluative feedback about learning effectiveness, and their selfgenerated motivational processes. Researchers found that learners who reported more extensive use of SRL strategies demonstrated higher academic achievement (Lan, 1996; Schunk, 1982, 1996; Schunk & Swartz, 1993; Zimmerman & Kitsantas, 1996; Zimmerman & Martinez-Pons, 1986), more positive motivation (Schunk, 1982, 1996; Schunk & Ertmer, 1999; Schunk & Swartz, 1993; Zimmerman & Kitsantas, 1996, 1999), and greater persistence (Lan, 1996) than learners who used the similar strategies less often.

From a social-cognitive point of view, selfregulatory processes and beliefs consist of three cyclical phases: forethought, performance or volitional control, and self-reflection (Zimmerman, 1998, 2000). According to Zimmerman, the forethought phase happens before efforts to learn, and sets the stage (goals and plans) for learning. Performance or volitional control processes occur during learning efforts, and concerns concentration and performance monitoring. Self-reflection processes take place after learning efforts. The results from self-reflection or evaluation affect learners' reactions to that experience. As a result, these self-reactions complete the self-regulatory cycle by influencing forethought of subsequent learning efforts.

From a general expectance-value perspective, self-regulated learning involves both the "will" and the "skill" (Pintrich & Schrauben, 1992). The "skill" component of the general expectancy-value model of SRL consists of three major categories of strategies, including: metacognitive strategies (planning, goal setting, monitoring and self-evaluation), cognitive strategies for learning and comprehending the materials (rehearsal, elaboration and organization), and resource-management strategies (help seeking, environmental management strategies and time management). Furthermore, the "will" or the various motivational aspects, including self-efficacy and goal orientation, are believed to facilitate and influence the use of these cognitive, resource-management, and metacognitive strategies.

Every learner is self-regulated to some degree in his or her academic learning, but there are remarkable differences among students (Zimmerman, 1998). Systematic use of metacognitive, motivational, cognitive strategies is a key feature of most self-regulated learners. Therefore, students' level of self-regulation may eventually decide whether their learning experiences will become frustrating or fulfilling.

Self-Regulation in Web-Based Distance Education

Web-based courses can be accessed by any eligible individual from any location, and asynchronous course components are available 24 hours a day, at the learner's convenience. Web-based distance instruction has become a

popular delivery method for education because of these features. Self-regulation, however, is essential for distance education students' success. Students are held more accountable for their own learning. Furthermore, they must cultivate the self-discipline to access the course communication tools on a regular basis to avoid falling behind with assignments (Simonson, Smaldino, Albright, & Zvacek, 2000).

One of the major problems existing in Webbased distance education is a high attrition rate (Zielinski, 2000). Various studies have reported such factors as lack of time and environment management skills (Kember, Murphy, Siaw, & Yuen, 1991; Osborn, 2001), low self-motivation (Osborn, 2001; Parker, 2003), lack of cognitive learning strategies (Chyung, 2001; Kember et al., 1991), discomfort with individual learning (Fjortoft, 1995), and low learner self-efficacy on using the technology for distance education program (Chyung, 2001; Osborn, 2001) are causing students to drop out of distance programs.

Several researchers have studied the influence of self-regulatory behaviors on learning in the online mode, but most of these studies focused on identifying self-regulatory strategies as predictors for achievement. King, Harner, and Brown (2000) conducted a study to measure students' perceptions concerning the effect of technology and student self-regulatory skills in two distance education courses. A factor analysis of the data indicated that two constructs attributed to online learning success were study skills and goal setting. Eom (1999) identified SRL strategies that learners already possess were related to the effectiveness of learning in a computer-networked hypertext/ hypermedia environment. His results demonstrated that metacognitive and motivational strategies significantly influenced the prediction of achievement, while cognitive and selfmanagement strategies did not exhibit significant effects. However, these studies assume that participants in distance education employ the same SRL strategies for traditional instruction in their learning. Very few studies have

explored which SRL strategies are used in Web-based courses to address the unique challenges of the online learning environment (Whipp & Chiarelli, 2004).

Research Questions

With the proliferation of distance education, more and more learners are taking online courses. A reasonable question to ask is how do students study in these online courses? Do online students who are working independently employ any learning strategies to help achieve learning outcomes? Can our existing understanding about SRL be applied to this new learning environment? This study was designed to use our current knowledge about SRL as a basis for exploring answers to these general questions and to identify issues that might warrant further investigation. This study combined Zimmerman's (1998, 2000) social cognitive model, which outlines the key subprocesses for SRL, and Pintrich's (1995) general expectancy-value model of SRL, which offers a closer examination of each specific category of strategies utilized in the processes, as a theoretical framework. With regard to this theoretical framework, this study used the following research questions to guide the investigation.

- 1. What SRL strategies do students use in a Web-based course?
- 2. What strategies do students think are the most helpful to their success in a Webbased course?

METHOD

Participants

This pilot study took place at a large Southeastern university in the U.S. during the summer semester 2005. Participants were 12 volunteer students enrolled in an online Technologies for Information Services course for information studies majors. These volunteers had an average age of 24.58 years. Six of them were seniors, 5 were juniors, and 1 was a sophomore. Eight were females and 4 were males. Five were African Americans, 1 was Asian American, 3 were Caucasians, 2 were Hispanics, and 1 was from another ethnic background. These participants had an average GPA of 2.89 and an average registration for 9 credit hours. They spent an average of 4.38 hours weekly studying for this course, while they also worked 20-30 hours per week. Five of these volunteers had family responsibilities that affected their time for studying in this course. Eleven of the participants thought they were competent with PC and Macintosh, 11 with Internet, 12 with e-mail, 8 with asynchronous discussion, and 7 with synchronous discussion. Seven of these volunteers had never taken online courses before, three had taken 1, one had taken 2, and one had taken 4.

Context

The Technologies for Information Services course focused on the application of computer hardware, software, and information systems for the provision of information services. The course content included recent technical developments with examples of real-world software applications. It also examined the principles by which computer systems and their networks support information seekers. It used a textbook entitled Using Information Technology: A Practical Introduction to Computers & Communications (Williams & Sawyer, 2001). Students' grades were determined by participation (10%), 11 weekly activity reports (50%), a project resource list (10%) and a final project (30%). Participation scores consisted mainly of synchronous weekly discussions on relevant topics, and weekly asynchronous class activities. These activities included reading the textbook and supplementary materials, viewing PowerPoint lectures posted in course Web site, and completing the activity reports and projects.

By the end of the semester, students were supposed to be able to explain the essential concepts and components of current information technology systems, including operating systems, user interfaces, hardware, and communications, and extend them to emerging contexts. Furthermore, they were expected to summarize the history, evolution, and characteristics of information technology. They were also required to describe the basics of network topology as well as the primary uses of networks and networking within the context of information provision.

Data Collection and Analysis

This descriptive study used qualitative methods to examine students' use of self-regulated learning in a Web-based course. A small group of students were selected as participants. An online survey with 13 open-ended questions was created using informal interviews with 5 faculty and 5 online students to discuss the general features of Web-based courses and to explore students learning strategies, plus information obtained from a review of literature on the cyclical process of learning (Zimmerman, 1998, 2000). This study was conducted as a pilot test to test the validity of the instrument and the feasibility of the research process.

Through the use of the online questionnaire, participants were asked to describe their goals in the course, their plan(s) for reaching their goals, how they usually completed assignments, how they read textbook and online materials, their obstacles and how they overcame them, their distractions and how they dealt with them, how they arranged time for studying, how they verified their understanding and progress in the course, and what strategies they deemed most helpful. Participants' answers to the online open-ended survey questions were the primary data source. Course syllabus, assignment descriptions, and student Web pages were used to contextualize the researchers' understanding of participants' answers to online survey questions. The survey was conducted 4 weeks after the semester began, and participants had 7 days to complete

the survey, which was accessible to participants through a Web link in an e-mail sent by the first author.

Participants' responses to questions were transcribed and the texts coded and analyzed using O. S. R. NVIVO software. To examine participants' answers to survey questions, the researchers followed the guidelines for qualitative content analysis (Chi, 1997), using an inductive constant comparative method (Glaser & Strauss, 1967) because the purpose of the study is to understand the strategies used during a learning process. The first author read participants' answers to survey questions several times and highlighted comment units or references (i.e., word(s), phrase(s) or sentence(s)) that described a type of learning strategy (open-coding) to capture main ideas, themes. Then, she began with a search for patterns within the data on each of the participants, and then across all participants (axial coding) to portray relationships. Finally, she summarized the learning strategies used in the process with the patterns found across all participants. Using Zimmerman's (1998, 2000) social cognitive and Pintrich's (1995) general expectancy-value models of SRL, a coding scheme was created based on the responses to survey questions. The first author and a trained coder tested in parallel the coding scheme on a sampling of participants' responses and then refined it and applied it to all the responses from all participants. Refer to Table 1 for a final version of the coding scheme.

To determine the inter-rater reliability for the coding scheme, an independent coder was trained to use the coding systems, and comparisons were made between coding of the survey responses made by the independent coder and the first author. The inter-rater reliability for the coding scheme was found to be about 90%. Each survey response was then coded independently by the first author and the trained coder using the coding scheme that included definition and example of each strategy to compare to the exact words in the responses. The first author and the trained coder resolved all disagreements on the references through further reading of the raw data and discussion. After all answers to survey questions were coded, the data from individual participants were examined by coding category. Next, the data were examined across participants by coding category.

In this study, a member checking was conducted by inviting a participant in the study to verify the accuracy of the findings and appropriateness of discussion. The participant considered the study procedures were described in sufficient details and the results were clearly reported, especially the quotes helped validate and reinforce the points.

RESULTS

Strategies Reported by Participants

In their answers to the open-ended questionnaire, participants mainly reported using all three categories (metacognitive, cognitive, and resource management) of strategies included by Pintrich (1995) in the "skill" component of SRL. This content analysis of the data indicated that participants in this study not only employed some strategies that successful students use in traditional learning environments, but also revised their SRL strategies (Whipp & Chiarelli, 2004) to adapt to their Web-based course setting. Results derived from the analysis of strategies are shown in Table 1.

Metacognitive Strategies

Within the category of metacognitive strategies, participants reported using goal setting (9 references), strategic planning (9 references), self-monitoring (30 references) and self-evaluation (8 references).

Self-monitoring was the most frequently reported (30 references) strategy within the metacognitive category. Participants took some measures to monitor their learning process, which was dependent on the stability of

TABLE 1	Category Definition and Descriptive Statistics

	Strategy and Category Definition	and Descriptive Statistics		
Category and Strategy	Definition	Example	Reference Total	Strategy Percentage
Metacognitive				31.46
Goal setting	Determining target results of learning or setting of subgoals	Basically I sit down with my computer and books and follow the work load that appears in the calendar. [sic].	6	5.06
Strategic planning	Selection of learning strategies or methods to achieve the desired goals	I plan to read a chapter a week and keep up with the assignments (for reaching my goals).	6	5.06
Self-monitoring	Intentional observation and record keeping of behavior, cognition and motivation for learning	 Monitoring of learning process: I print hard copies of the online material to place in a notebook I keep for the course. I refer to it when I'm submitting assignments. Monitoring of compreshension: How do you know when you understand something really well? (I know I understand something really well) When I can explain it to somebody else, and answer questions. 	30	16.85
Self-evaluation	Making self-judgment and causal attribution about learning performance	I compose my messages (for discussion) first in a text editor to make sure I do not spell anything wrong	00	4,49
Cognitive				33.71
Rehearsal	Selecting and encoding information in a verbatim manner	Repetition is what works for me. I read the chapter and than the following week rolls around and I read the next chapter and reread the first one and answer and reanswer [sic] the study questions from the previous chapter.	46	25.84
Organization	Constructing internal connections among information given in the learning material	I usually look for figures and examples in both cases (When I am reading the textbook and online materials).	7	3.93
Elaboration	Making information meaningful and building connections between information given in the learning material and prior knowledge	I write a brief summary to myself regarding each topic (When I am reading the textbook materials)	2	3.93

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source Management				34.83
Time management	Scheduling, planning, and managing one's study time.	I usually work on it (coursework) in the morning at the library three times a week because I don't have my kids then.	16	8.99
Environment management	Making one's study environment organized, quiet, and free of visual and auditory distractions	I don't answer the phone when I am studying. I tune out any background noise (to deal with distractions).	13	7.30
Effort regulation	Controlling effort and attention in the face of distractions and uninteresting tasks.	Just try to stay focused and know when to take breaks keep trudging along even when I'm [sic] really not in the mood to absorb information or study	Π	6.18
Help-seeking	Securing assistance from others or tools to cope with academic difficulty	When I do not understand the material or want further insight I usually do a search on the Internet and in classes that are IT or information study related.	22	12.36

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the technologies, as well as their own comprehension of the materials

In regard to self-evaluation/reflection, participants reported on their perceived criteria for evaluation, which is unique to online courses, and their actual strategies to evaluate performance, which were also modified to suit the online learning environment. As a result, participants believed their success was based on the teacher's standards and their performance in a group as a whole, as exemplified by the following responses: "The approach mostly depends on the teacher and the way he/ she likes the assignments to be presented." and "I work pretty well on group assignments depending on the members in the group. If they are focused then I can work great, if not then there will be some issues."

Cognitive Strategies

In this study, cognitive strategies were the most frequently (12 cases, 60 references) reported by participants in all the responses to survey questions.

Most of the cognitive strategies reported were similar to the ones students generally use for traditional instruction. Overall, the most frequently used strategies were rereading (16 references), note-taking (11 references) and visualizing (7 references), and 7 participants gave 10 references about using the audio portion of their lecture in various situations for study.

Generally speaking, most participants were using less complex cognitive strategies, mainly rehearsal strategies (11 cases, 46 references) (e.g., rereading), while fewer participants used more advanced organization (7 cases, 7 references) (e.g., flash cards) and elaboration strategies (5 cases, 7 references) (e.g., visualizing).

Resource Management Strategies

The resource management strategies reported by participants included time management (16 references), effort regulation (11 references), environment management (13 references), and help seeking (22 references).

Help seeking strategies was the most frequently (22 references) reported in this category. Overall, the most frequently used strategies were using the Internet (7 references), informing/asking a teacher, TA or tutor (6 references), and referring to other sources (e.g. family, friends) (4 references). Only one participant gave 2 references about an onlinespecific help-seeking strategy, using course discussion boards/peers to understand difficult contents.

Not being able to locate a textbook (3 cases) at a local bookstore caused some anxiety in this class, but positive help seeking helped ease learners' anxiety. The following excerpt demonstrates participants' employment of help-seeking strategies in this online environment.

P7: The only confusion and I would not say obstacle is when I could not find the text book assigned in neither of the bookstores in town, but once I contacted the TA I was able to acquire the book in no time.

Perceived Most Helpful Strategies

Generally, participants reported two broad categories of strategies: cognitive strategies (7 cases, 7 references) and goal setting/effort control/time management (5 cases, 5 references), as their perceived most helpful strategies.

Most of the goal setting strategies reported were adopted from the features of this Webbased distance learning course, but not many references for this type of strategies were reflected in participants' responses. Within the 9 references made by 5 participants, they mainly reported using discussion board questions (4 references) and assignments (3 references) as immediate goals to complete course tasks and to find the focus for their work. Additionally, they coordinated online and offline coursework on the basis of these immediate goals.

The data suggest that getting assignments done on time or ahead of the schedule was crucial to the participants in this online course. The value of completing tasks on time and keeping up with coursework was conveyed by one participant: "The goals I'm working for in this course is to become more familiar with IT tools. The plan I choosing to achieve this goal is to stay on top of things and study."

Participants arranged their time for study around their working schedule. Among the 8 participants who worked more than 20 hours per week, 1 planned to study during the day, 4 planned to study during the night, and 2 gave indefinite answers. Five participants specifically designated different time for different types (online or offline) of coursework.

Examining the final grades of the 6 participants who worked more than 31 hours weekly, 3 received B's, and 2 received C's and 1 received a D. The two participants who received C's provided indefinite answers to questions about time management strategies, while the two participants who received the highest scores (88 in a class average of 80.7) were also within this working-hour category, but expressed definite plans for time management. The contrast in their time management was illustrated with the following responses:

- P1: Well I am never really offline, even when I am doing my course work I check the discussion and email regularly. Therefore I do not have a time of day or days of week were I usually do online/ offlie [*sic*] work. (Received a 79.4 for course score).
- P7: I do my offline coursework in the morning (3am) hours because I work better in the morning than in the evenings. My online coursework I do throughout the day—whenever I get at least two hours of break. (Received an 88 for course score)

Family responsibilities (e.g., small children) can cause obstacles in online courses because

many distance learners study at home and need to take care of family. In this study, 5 (42%) of the 12 participants reported having family responsibilities that affected their time for studying for this course. Three of these 5 participants had definite plans for time management and received well above average scores (83, 88, 88 in a class average of 80.7). These following excerpts describe how one of these participants utilized time and environment management and effort regulation strategies to overcome difficulties and to accomplish learning outcomes (a final score of 83).

- Q: Do you expect to meet any obstacles in the course? What are they? When faced with obstacles in the course, what will you do to overcome these obstacles?
- A: I tend to meet obstacles in all my courses with two small children. For instances, this past weekend my son and myself have been sick which makes it hard to keep on track. To compensate for my time lost studying I will have to stay up late a couple of nights this week to catch up.
- Q: What time of day and day(s) of the week do you usually do your offline coursework? Why? What time of day and day(s) of the week do you usually do your online coursework? Why?
- A: I usually am working on something daily or at least I try to. I usually work on it in the morning at the library three times a week because I don't have my kids then. I also work on it in the evening when my kids are sleeping.

DISCUSSION

Based on the findings from this study, the following section proposes implications for Webbased course instructors and designers, and suggestions for future research.

Goal-setting/effort control/time management is a combined category of strategies perceived by participants as the most helpful strategies in online learning. This finding is consistent with those of several other studies (Azevedo, Guthrie, & Seibert, 2004: Hill & Hannafin, 1997; Loomis, 2000) about learning strategies in online environments, including the finding from a quantitative study (Loomis, 2000) of the strong correlation between time management skills and final grades in an online course. From the data in this study, we also found that many online participants were working for pay while taking courses. It seemed that the more a participant works, the more likely he or she would try to complete coursework during the night or at a previously unplanned time. However, it was also discovered that working full time itself might not affect students' performance. Instructors in a distance education environment might need to communicate deadlines and due dates clearly, emphasize the use of time-management, effort regulation and goal-setting strategies, especially to students who are working full-time or who have family responsibilities.

Cognitive strategies were reported by participants as another category of their most helpful strategies. Overall, cognitive strategies were the most frequently reported by participants in all the responses and reading and repetition was reported by 25% of the participants. These findings are very similar to what Whipp and Chiarelli (2004) found about their participants in a Web-based course in that most participants were using less complex cognitive strategies, essentially rehearsal strategies, while fewer participants used more advanced organization and elaboration strategies. Instructors might encourage students to use more sophisticated strategies, such as organization (e.g., concept mapping and outlining) and elaboration (e.g., using mnemonics, summarizing and reciprocal teaching) for deeper processing of information (Hofer, Yu, & Pintrich, 1998). Recommendations can also be made for more online-specific cognitive strategies, such as reading while listening to the lecture, copying online materials into a text editor and rewriting into personal notes, and replaying the lecture, to be more adapted to the distance education environment.

In this study, the most frequently reported help seeking strategies were using the Internet and informing/asking a teacher, TA or tutor. However, only one participant mentioned an online-specific help seeking strategy, using course discussion boards/peers to understand difficult content. This finding is similar to what Zariski & Styles (2000) found from their interview with 16 law students. They found even though these students in two online courses used help seeking to deal with technical problems more extensively than their counterparts in more traditional educational contexts, there was only very limited use of options (e.g., Unit Guide, the Chat Room, Help button, etc.) available in the course site for help seeking. Instructors may need to provide guidelines on help seeking in cyberspace since some of the learners are not very familiar with this learning environment. Instructors might want to encourage online learners to utilize discussion boards more actively, by setting up a forum named Online Office or Student Lounge, for help seeking and critical discourse.

There are many limitations to this pilot study. The research design could be improved by administering a well-structured questionnaire with objective items, followed up by a phone interview or focus group, across several courses later in the semester. Experimental studies on a large scale are needed to verify some of the speculations from this study about SRL strategies in distance education, namely, the relationship between work load, time management and achievement, the social aspects (e.g., peer learning, help seeking, class discussions) in online learning (Whipp & Chiarelli, 2004), and the interrelated self-regulation and co-regulation, such as in group projects, that might happen within the learner populations.

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