ADULT LEARNERS' MOTIVATION IN SELF-DIRECTED E-LEARNING

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ABSTRACT

Kyong-Jee Kim

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As with traditional instruction, learner motivation is important in designing

effective e-learning courses. However, lack of motivation has been a major concern in

theory and practice for facilitating successful online learning environments. A review of

literature indicated that there is little empirical knowledge on how to motivate online

learners, particularly in self-directed e-learning settings (SDEL). Research questions

addressed in this study included: 1) what motivates or inhibits adult learning in SDEL?

2) does adult learner motivation change as he or she goes through SDEL? 3) what factors

are related to motivational change during SDEL?

This study used mixed methods. A content analysis was conducted on three

SDEL courses in order to better understand the learning context. Twelve qualitative

interviews of typical learners were conducted to identify major motivational factors.

Analysis of these interview results led to construction of a 60-item Web survey of adult

learners who had taken one or more SDEL courses ($n = 368$). Approximately 60 percent

of the respondents were from corporate settings and 40 percent from higher education. A

factor analysis of 33 survey items led to identification of three strong factors: 'e-learning

is not for me'; 'e-learning is right for me'; and 'I don't want to be all by myself'.

Results from both qualitative and quantitative analyses indicated that learners

started SDEL for personal or professional development, and that they chose the online

training option because of its flexibility and convenience. Both qualitative and

quantitative results suggested that lack of motivational quality in the e-learning course

was a key factor for some learners who decided not to complete the course, followed by

lack of time. A stepwise multiple regression analysis resulted in five factors that

significantly contributed to predicting the learner's reported motivational change: 1) E-

learning is right for me; 2) satisfaction with their learning experience; 3) interactivity

with an instructor or technical support personnel; 4) age (negative relationship); and 5)

learning setting (corporate more than higher education).

Implications of findings from this study are discussed for design of self-directed

e-learning environments that may help increase or sustain learner motivation.

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INTRODUCTION

1.1 Statement of the Problem

The technology of the World Wide Web (henceforth, the Web) is changing the

way people learn, work, and socialize (Bonk & King, 1998). In particular, more and

more adults are turning to the Web for their learning needs due to its flexible delivery

system in both education and training settings. Although the effectiveness of Web-based

instruction - now often called e-learning - has been reported in many studies (e.g., Jung &

Rha, 2000; Olson & Wisher, 2002), high learner drop-out rates have been a concern in

Web-based instruction (Carr, 2000; Cornell & Martin, 1997; Dalton, Manning, Hagen,

Paul, & Tong, 2000; Diaz, 2002; Frankola, 2001; Islam, 2002); this has also been the case

in distance education (Howell, Williams, & Linsday, 2003; M. G. Moore & Kearsley,

1996).

Past studies of factors contributing to learner attrition in distance education in

educational and training settings suggest that lack of time and lack of motivation are the

major causes of the problem (Bonk, 2002; Galvin, 2003; Gibson, 1998; Visser, Plomp,

Amirault, & Kuiper, 2002; Wolcott & Burnham, 1991). Therefore, those factors need to

be taken account in addressing the problem of learner attrition in Web-based instruction.

In addressing this issue, although instructional designers or instructors do not have

control over the learner's time, they can exert some influence on the learner's motivation.

Cognitive theories of motivation and research findings indicate that learners' motivation

tends to change over time through instruction (R. C. Clark, 2003; Coldeway, 1991; Song

& Keller, 1999). Hence, we need to pay attention to improving the motivational quality of Web-based instruction in order to address the issue of online learner attrition.

E-learning is a rapidly growing market and is expected to continue to be so in the future. According to a survey report, the U.S. e-learning market in 2002 was $10.3 billion and is projected to grow to $83.1 billion in 2006 (Adkins, 2002).[1] From a global perspective, the worldwide corporate e-learning market is expected to leap from $6.6 billion in 2002 to over $23 billion by 2006 (IDC, 2003). Considering the amounts spent on e-learning, it is imperative that the investment be worthwhile for stakeholders. To accomplish that goal, e-learning courses need to provide learners with a learning environment that builds success for them. Many researchers and practitioners in e-learning believe that stimulating student motivation is one of the critical factors for creating a successful online learning environment (Hofmann, 2003; Powers & Guan, 2002).

Many argue that motivation makes significant impacts on learners. First of all, past research has consistently reported positive and robust correlations between the learner's motivational level and his or her academic achievement in traditional classroom environments (Fyans & Maehr, 1987; Uguroglu & Walberg, 1979; Walberg, 1984). It is argued that learners need not only to possess the necessary cognitive and meta-cognitive skills to be effective in their learning, but also need to be motivated to use such cognitive strategies to regulate their cognition and effort to use their cognitive and meta-cognitive

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[1] Consumers of the e-learning market consist of those from various sectors, yet business organizations and educational institutions (K-12 and higher education) were the most dominant sectors, representing over 70% of the total e-learning spending in 2002.

skills effectively (Pintrich & De Groot, 1990). Accordingly, several researchers have emphasized the importance of motivational influences of learning as key principles of effective instruction (American Psychological Association, 1993; Bransford, Brown, & Cocking, 2000).

Second, motivation has a significant impact on the learner because it not only enhances and mediates learning during instruction but also is a consequence of the learning (Wlodkowski, 1998). It is believed that motivational aspects of one's learning experience can influence his or her inclination toward lifelong learning. There is an increasing emphasis on lifelong learning as society calls for a more skilled workforce. Therefore, it is important to foster lifelong learners to meet such societal demand, and one's motivation to learn plays an important role in fostering one's propensity to become a lifelong learner. The desire to expand one's knowledge and skills is an important source of motivation to learn, and lifelong learners usually find expanding their knowledge and skills an interesting and satisfying way of living. Thus, motivating learning experiences can foster one's propensity for lifelong learning (Smith & Spurling, 2001; Wlodkowski, 1998).

Given the significant impacts that motivation has on learners, many educational theorists and researchers consider motivating learners to be an important part of designing effective instruction. Gagné (1985), for instance, states that activating the student's motivation is one of critical events for effective instruction. Keller (1983) has also described motivation as being at the heart of one's understanding of designing effective instruction. Theorists and researchers have put an emphasis on learner motivation in online learning environments as well. As with traditional classroom

instruction, learners' motivation to learn is a critical factor for them to be successful in Web-based instruction (Greer, Hudson, & Paugh, 1998; Li, 2002; McCall, 2002). Many argue that motivating learners is an important instructional design component for Web-based instruction (Bonk, 2002; Duchastel, 1997; Ritchie & Hoffman, 1997).

Despite the importance of learner motivation for successful online learning, there seem to be many challenges in keeping learners motivated in an online learning environment. Responding to the motivational requirements of learners in Web-based instruction poses a great challenge to educators and instructional designers because interaction is lacking in online learning environments (Bonk & Dennen, 2003; Cornell & Martin, 1997; Keller, 1999). Given the problem of learner attrition and the challenge of motivating learners in online learning environments, it seems particularly important to consider the motivational quality of instruction when designing and delivering Web-based instruction.

Although the importance of motivating learners in Web-based instruction has been recognized, there is a paucity of research on the theory and practice of designing motivating Web-based instruction (Keller, 1999; Song, 2000; Visser et al., 2002). According to Dennen and Bonk (in press), "motivational principles for Web-based instruction are only beginning to emerge and learners' motivational issues need to be addressed in order for Web-based instruction to thrive and be a positive learning experience for them."

In particular, Song (2000) notes that there has been a lack of systematic discussion on the motivational design of Web-based instruction. A systematic approach to the motivational design of instruction enables one to analyze motivational gaps of the

learner and to identify design approaches to bridge such gaps (Keller, 1987). Therefore, an analysis of the motivational problems of learners in Web-based instruction is warranted as part of a systematic approach to identifying the principles for motivational design of Web-based instruction.

1.2 Definitions

1.2.1 Adult Learners

This study investigated the motivational issues of adult learners who participate in self-directed e-learning. Knowles (1980) defined adults as those who perform roles associated with adults by one's culture (e.g., workers, spouses, parents) and perceive themselves to be responsible for their own lives. Adult learners, therefore, are adults who are engaged in learning in various instructional settings. More specifically, adult learners in this study include working adults who participate in workplace learning in a variety of work settings (e.g., corporations, government agencies, non-profit organizations, and military organizations) as well as adult students in formal education, attending accredited educational institutions (e.g., a graduate degree program).

1.2.2 Self-Directed e-Learning

This study investigates adult learners in self-directed e-learning environments, in which learners go through instructional materials delivered via the Web at their own pace with no or minimal interaction with an instructor. Here e-learning can be defined as a form of Web-based instruction in which the learner goes through instruction delivered via the Web. Khan (1997) defines Web-based instruction as "a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web

to create a meaningful learning environment where learning is fostered and supported" (p. 6).

Self-directed e-learning is a form of Web-based instruction in that it utilizes the Web medium to deliver instruction and learning resources. Self-directed e-learning is, however, distinctive from other forms of Web-based instruction (e.g., Web-based distance education programs offered by colleges and universities) in that there is no or minimal interaction between instructor and student in this learning environment. In such courses, no student-instructor interaction is required on a regular basis to complete the self-directed e-learning course; students interact with the instructor on a need basis when they have a question or need help.

Self-directed e-learning also differs from traditional classroom instruction in several aspects. First, in most cases no human interaction takes place during the instruction in self-directed e-learning, as was described earlier. Second, this type of learning is self-paced, which means learners go through instruction by interacting with the content on their own and at their own pace. Thus, learners in self-directed e-learning environments are not given any pre-set course schedule, nor must every learner follow the same sequence of instruction as is the case in traditional classroom instruction.

Because of its flexibility and convenience, self-directed e-learning can take place in a wide range of educational settings for adult learners. Unlike young students receiving formal education, adults can participate in education and training in a variety of instructional contexts to fulfill their learning needs. As such, working adults can participate in self-directed e-learning as part of their workplace learning for a variety of purposes (e.g., recertification, career advancement, personal development). Likewise,

adult students in formal education settings can also engage in self-directed e-learning in addition to regular credit courses for their career development or personal enrichment.

The self-directed e-learning approach can also be used in diverse instructional formats. Self-directed e-learning is often used for stand-alone instruction when an instructor is not available (Hannum, 2001). It can also be incorporated into a blended instruction format, where multiple delivery modes are used for instruction to maximize its effectiveness and efficiency (Bonk & Graham, in press). For instance, self-directed e-learning can be offered as a learning activity supplemental to instructor-led classroom instruction.

As self-directed e-learning is available to adult learners in diverse instructional settings, the purposes and motivations for adult learners to participate in self-directed e-learning are diverse as well. Some extrinsic rewards or punishment - e.g., certification, Continuing Education Units (CEUs), employee performance record – are provided for those who participate in self-directed e-learning. Some may be mandated to take self-directed e-learning for their job; others may participate in self-directed e-learning without such extrinsic rewards or punishments but for the fun of learning itself. Therefore, self-motivation seems to be particularly important to initiate and persist in self-directed e-learning.

1.2.3 Motivation

Since motivation can be defined in many ways (Keller, 1983), definitions of motivation offered by some researchers are reviewed to construct an operational definition of motivation for this study. Keller (1983) defines motivation as "the magnitude and direction of behavior" (p. 389). In particular, he argues that "effort is a

direct indicator of motivation" (p. 391). Similarly, Clark (2003) also defines motivation to learn as the effort and persistence that the learner exerts in his or her learning.

In regard to Web-based instruction, Song (2000) defines motivation to learn as the direction and magnitude of effort to learn through Web-based instruction. He also argues that three types of motivation – i.e., motivation to initiate, motivation to persist, and motivation to continue – are important in Web-based instruction. From existing constructs of motivation, motivation for self-directed e-learning can be defined as the degree of effort and persistence to learn in self-directed e-learning settings.

The presence of motivation can be inferred from such behavioral indicators as "choice of tasks, effort, persistence, and achievement" (Pintrich & Schunk, p. 13). Effort and persistence are indicators of motivation in the sense that the more learners are motivated, the more effort and persistence they are likely to exhibit to accomplish a learning task (Keller, 1983). However, it is noteworthy that several researchers have provided caveats for using such indicators of motivation to operationalize the concept of motivation. Keller (1983) argues that it is difficult to measure motivation because of its variability; the degree of effort and commitment people make to a task tend to be varying rather than stable.

As such, Keller (1983) advises one to take cautions in operationalizing the concept of motivation in as a straightforward manner as is done, for example, with the concept of ability. Moreover, Pintrich and Schunk (1996) argue that such behavioral measures of motivation are likely to be affected by the learner's skill level. That is, when the learner is highly skilled on a topic, he or she will be able to perform well without exerting much effort and time on the instruction. Therefore, it is suggested that the

learner's effort and persistence in a given task be used only as indirect indicators of motivation in investigating the learner's motivation.

1.3 Purpose of the Study / Research Questions

The purpose of this study was to investigate problems associated with adults' motivation for self-directed e-learning. This study attempted to identify and explore adult learners' perceptions of factors that foster or inhibit their motivation to engage in self-directed e-learning. The research questions were:

- What motivates or inhibits learning in self-directed e-learning environments?

- Does a learner's motivation change as he or she goes through instruction in self-directed e-learning? If so, how?

- What influences a learner's motivational change during self-directed e-learning?

1.4 Significance of the Study

Self-directed e-learning is a form of instruction that is readily available to adult learners for their workplace learning and continuing education. In fact, a majority of educational and business organizations are using the Web medium to deliver instruction (American Federation of Teachers, 2000; Galvin, 2002), and self-directed e-learning is the dominant instructional format in training programs offered via the computer medium in workplace learning settings (Dolezalek, 2004; M. Driscoll, 2002; Galvin, 2002). Therefore, it can be argued that self-directed e-learning is an important source of

continuing education for adult learners and it will likely continue to be so in the future due to the flexibility and convenience of its delivery method.

Despite the wide availability of self-directed e-learning for adult learners, past studies of motivational issues in Web-based instruction have focused on formal educational settings (e.g., Web-based distance courses in post-secondary institutions). Therefore, there is a need for research on motivational issues that are related to the learners in self-directed e-learning settings. Although this study limits its scope to a specific instructional format of Web-based instruction in which there is no or minimal interaction between the instructor and students or among students, it is worthwhile to focus on this instructional format because it can influence millions of adult learners who are learning in this kind of instructional format.

By examining the motivational problems of adult learners in self-directed e-learning, this study is expected to provide an empirical base for understanding the motivational needs of participants in self-directed e-learning. The findings of this study may inform instructional designers and instructors how to design a self-directed e-learning environment that supports and enhances learners' motivation. As a result, learners may benefit from participating in online learning environments that are more engaging and enjoyable to them.

CHAPTER II.

REVIEW OF THE LITERATURE

2.1 Theories of Motivation

Several theories have provided theoretical frameworks for understanding human motivation (Pintrich & Schunk, 1996). Among various constructs of motivation, Kinzie (1990) argues that continuing motivation and intrinsic motivation are the most significant constructs for learners of computer-assisted instruction. Theories relevant to intrinsic motivation and continuing motivation and ways to measure these motivational constructs are discussed below.

2.1.1 Intrinsic Motivation

Intrinsic motivation is defined as the motivation to engage in an activity "for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000). Theories and past studies of motivation have suggested several sources of intrinsic motivation. Some motivational researchers posit that activities which provide learners with a sense of control over their academic outcomes may enhance their intrinsic motivation (Pintrich & Schunk, 1996). From studies of computer-based instruction, Malone (1981) contends that challenge, fantasy, and curiosity are major components of intrinsically motivating instruction. Similarly, Lepper and Hodell (1989) have identified challenge, curiosity, control, and fantasy as primary characteristics of tasks that promote intrinsic motivations for learning.

In addition to intrinsically motivating activities and tasks, motivational researchers have studied psychological influences in intrinsic motivation. Research

suggests that the belief on the part of the learner that individuals can exert control over their environment is a source of intrinsic motivation. Deci and Ryan (1985) suggest that self-determination, which is humans' willingness to be autonomous and to engage in activities, is an important determinant of intrinsic motivation. Reeve (2000) argues that some emotional states such as curiosity, interest, and enjoyment can have positive influences on intrinsic motivation.

Some motivational researchers also postulate that intrinsically motivated learners are engaged learners. Engagement is "… a merger of multiple qualities that entails holding a purpose, seeking to understand, believing in one's own capability, and taking responsibility for learning" (Guthrie, 2003). Engagement appears to have bearing on the learner's orientation toward goals. Two main goal orientations are generally discussed in goal orientation theories; mastery (or learning) goals and performance goals (Pintrich & Schunk, 1996). It is believed that learners with different goal orientations exhibit different motivational dispositions.

Learners with mastery goals tend to focus on achieving mastery; they are willing to accomplish something challenging and to gain understanding or insight from the tasks. As a result, learners with mastery goals are likely to be intrinsically rewarded for their continuous efforts to meet challenges (Dweck & Leggett, 1988). In contrast, learners with performance goals tend to focus on demonstrating their competence or ability and on how their ability will be judged compared to others, thereby being influenced by extrinsically motivating factors. Therefore, the mastery-goal orientation is more likely to foster intrinsic motivation of the learner and his or her engagement in learning than the performance-goal orientation (Guthrie, 2003).

There is ample research evidence that intrinsic motivation is more beneficial in promoting learning and achievement than extrinsic motivation (Pintrich & Schunk, 1996). Researchers have, however, recognized that not every human behavior is intrinsically motivated. Extrinsic motivators (e.g., extrinsic structures, controls, rewards) can also motivate human behaviors (Pintrich & Schunk, 1996). Thus, research evidence indicates that both intrinsic and extrinsic motivators contribute to some extent to enhancing motivation to learn (Park, 1996). Moshinskie (2001) also argues that the learner's motivation results from his or her intrinsic interest and from extrinsic efforts supported externally by the learning environment (e.g., motivational strategies in the instruction, social interactions, positive climate). Therefore, the literature suggests that both intrinsic and extrinsic motivation need to be taken into consideration in order to understand motivational aspects of online learners.

2.1.2 Continuing Motivation

Continuing motivation reflects an individual's willingness to learn and is the type of intrinsic motivation that is most directly relevant to education (Maeher, 1976). Maeher (1984) makes a distinction between persistence and continuing motivation. He states that persistence is inferred when a person keeps on working on a task, whereas continuing motivation refers to when a person returns to a task despite an interruption of the task.

Continuing motivation is displayed when the learner returns to a learning activity presumably because of his or her intrinsic interest in the activity, not because of external pressure (Kinzie, 1990). Similarly, Condry and Chambers (1978) contend that the primary reward for the learner is the learning activity itself. In other words, they posit

that continuing motivation is facilitated by an intrinsic interest in the activity. Some

researchers (Maeher, 1976; Martin & Briggs, 1986) also postulate that the learner's level

of satisfaction with learning has a paramount impact on his or her continuing motivation.

The learner's perceived control also seems to have a positive influence on his or her

continuing motivation (Kinzie, 1990; Kinzie & Sullivan, 1989).

There are individual differences among learners with regard to continuing

motivation according to their attributional characteristics. According to Weiner (1992),

learners' perceptions of their learning experiences influence their continuing motivation.

People tend to attribute the causes of success or failure of their learning to internal or

external reasons, and the attributions they make can influence their persistence in

learning. Learners who attribute their poor performance to factors that are out of their

control (e.g., bad luck, lack of time) are unlikely to persist in the task. In contrast,

learners who attribute their poor performance to themselves (e.g., a lack of important

skills, poor study habits) are more likely to persist in the task.

Goal orientation is also important in understanding the motivation to continue or

persist in learning. Some argue that there is an interaction between the learner's goal

orientation and his or her self-confidence, especially for those with low self-confidence.

Learners with high self-confidence tend to demonstrate high persistence in a task

regardless of their goal orientation. However, those with low self-confidence tend to

avoid challenge and will likely quit rather than persist in the task (M. P. Driscoll, 1994);

learners with low self-confidence will more likely persist when they have mastery goals

as opposed to performance goals (Tollefson, 2000). In addition to self-confidence, it is

argued that specific and short-term goals, as opposed to general and long-term goals, help

learners attribute success to their efforts (Stipek, 1998).

2.1.3 Measuring Motivation

I reviewed existing instruments for measuring the learner's motivation by

searching the Mental Measurement Yearbook and ERIC database. Search results

indicated that there were no existing instruments specifically designed for measuring

intrinsic motivation and continuing motivation. Instead, I found a few instruments for

measuring motivation for classroom instruction based on various motivational constructs.

The most relevant and widely used instruments to measure motivation for learning in the

classroom context appear to be the Motivated Strategies for Learning Questionnaire

(MSLQ) by Pintrich and De Groot (1990) and the Instructional Materials Motivation

Survey (IMMS) by John Keller (1993).

Pintrich and De Groot (1990) developed a self-report instrument to measure

college students' motivational orientations and their self-regulated learning strategies

based on the social-cognitive theoretical framework of learner motivation and self-

regulation. The Motivated Strategies for Learning Questionnaire (MSLQ) consists of 56

question items regarding five factors related to motivation and self-regulated learning:

self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation.

Keller (1993) developed an assessment tool to measure the motivational quality of

instructional materials based on his model of motivational design of instruction (Keller,

1983). The Instructional Materials Motivation Survey (IMMS) includes 36 Likert-scale

items that measure learners' responses about their motivation for studying instructional

materials based on four major components of motivational design of instruction; i.e., attention, relevance, confidence, and satisfaction.

These two aforementioned instruments have been used in several studies to measure the learner's motivation in various instructional settings and were shown to be reliable and valid (Garcia & Pintrich, 1995; Keller, 1993). However, it seems inappropriate to adopt one of these instruments to measure motivation for this study for the following reasons. First of all, none of these instruments seems to offer a perfect fit for measuring the learner's motivation for this study. MSLQ measures motivation from motivational constructs that are different from the theoretical framework of this study, which will be described later in this chapter. IMMS focuses on instructional materials and only includes question items about the four components of motivation (i.e., attention, relevance, confidence, and satisfaction). Second, these instruments are designed for classroom instruction settings, and there is a lack of research evidence that these instruments are reliable and valid for measuring the learner's motivation in online learning settings. Thus, it is yet to be seen whether these instruments can be applied to measuring motivation of online learners.

Therefore, this study will not attempt to adopt the existing instruments to directly measure the learner's motivational level; neither is it the goal of this study to do so. Instead, this study will describe the changes in the learner's motivation over time both qualitatively and quantitatively. This study will also attempt to investigate motivational influences in self-directed e-learning from various theoretical frameworks of motivation. Among various motivational frameworks, three motivational frameworks appear to be of particular importance to online learning settings, as suggested by Duchastel (1997). He

posits that three motivational frameworks are most relevant to Web-based instruction:

Keller's (1983) theory of motivational design of instruction, Wlodkowski's (1998) time-

continuum model of motivation, and Malone's (1981) theory of intrinsically-motivating

instruction.

2.2 Theoretical Framework of Factors Influencing Learner Motivation

Due to a lack of research on motivational influences in online learning

environments, I reviewed past studies on motivational issues that are relevant to

computer-assisted instruction and distance education in order to find research results that

may have implications for Web-based instruction. Song (2000) argues that it is important

to review motivational issues in computer-assisted instruction and distance education,

because the motivational features the learner encounters in such educational settings are

similar to those in Web-based instruction.

By reviewing past studies of factors that influence learner motivation primarily in

computer-based instruction and distance education settings, I developed a theoretical

framework for influences on the learner's motivation in self-directed e-learning. These

motivational influences in self-directed e-learning are organized into three major

categories of motivational influences in Web-based instruction (e.g., internal, external,

and personal factors), as suggested by Song (2000). Internal factors are related to the

features of the course itself that can influence the learner's motivation. External factors

refer to aspects of the learning environment that can influence the learner's motivation.

Personal factors refer to motivational influences caused by the learner (S. Song, personal

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communication, November 9, 2004). The theoretical framework for motivational influences in online learning is described below.

2.2.1 Internal Factors

Given the complex and multi-faceted nature of human behaviors, a full range of human cognition and emotions needs to be investigated for an understanding of human motivation (Weiner, 1984). From such a standpoint, Relan (1992) suggests a holistic framework that takes into account cognitive, affective, and social factors of motivation in order to understand how to improve learner motivation. In this section, past studies of learner motivation are reviewed based on the three major categories of motivational influences (i.e., cognitive, affective, and social factors) suggested by Relan (1992).

1. Cognitive Influences

Cognitive theories of motivation suggest that cognitive processes are important mediators of motivation. In particular, there are two important motivational factors from the cognitive perspective: expectation of success, and task value (M. P. Driscoll, 1994). A review of literature on the motivational influences of learner expectancy and task value is presented below.

Social cognitive theory contends that individuals' actions are influenced by "their thoughts, goals, beliefs, and values" (Pintrich & Schunk, 1996) and some theorists posit further that self-perceived ability impacts one's motivational level. In particular, self-efficacy is believed to be causally related to the effort and persistence that one expends on his or her behaviors (Bandura, 1997). Hence, self-efficacy appears to significantly influence on learners' motivation because it influences the likelihood and the amount of effort and persistence in their learning (M. P. Driscoll, 1994).

The effects that self-efficacy has on one's perceptions and learning outcomes have been studied in various instructional situations. Research results indicate a positive relationship between students' self-efficacy beliefs and their motivation, learning, and performance (Multon, Brown, & Lent, 1991; Schunk & Pajares, 2001). In an experimental study of print versus televised instruction, Salomon (1984) found that an individual's self-efficacy in the medium influenced both the effort that the learner invested in learning through the medium and the outcomes of that learning.

In regard to Web-based instruction, research results suggest that computer or Internet self-efficacy is an important factor influencing the learner's satisfaction and participation in learning. In a study of Korean junior high school students in Web-based science class sessions, Joo, Bong, and Choi (2000) found that the students' academic self-efficacy (i.e., perceived beliefs for successful mastery of given instructional materials), their chosen cognitive strategies, and their Internet self-efficacy affected their self-efficacy for self-regulated learning. Similarly, Lim (2001) reported that learners' computer self-efficacy was a predictor of satisfaction and intent to take future online courses among adult learners enrolled in a Web-based higher education program. Hill and Hannafin (1997) also found a positive correlation between the learner's confidence in using computer technologies and his or her level of engagement in online learning.

In addition to learners' expectations for success, the values that they place on the learning task also play an important role in their performance and achievement. Some motivation researchers and theorists posit that the value that students place on learning will determine, in part, the levels of their cognitive engagement (Brophy, 1983). Past studies of college students in both traditional classroom and distance education settings

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have shown that learners' task value influenced their effort and persistence in their learning (Bong, 1999; Fjortoft, 1996; Menager-Beeley, 2001; Wolters & Rosenthal, 2000).

Research has shown that relevance is an important motivational influence across various educational settings. According to Keller (1983), relevance is "… the learner's perception of personal need satisfaction in relation to the instruction, or whether a highly desired goal is perceived to be related to the instructional activity" (p. 395). Research has been consistent about the effects of the learner's perception of relevance on his or her motivation to learn. Newby (1991) found that motivational strategies that emphasized the relevance of instruction to elementary students made a positive influence on their on-task behaviors. Past studies also indicate that relevance is an important motivational component in distance education and computer-assisted instruction (S. Y. Chyung, 2001; Visser et al., 2002).

Relevance can be embedded into instruction either intrinsically or extrinsically. Internal relevance is attained when the learner perceives intrinsic needs to learn the subject matter. External relevance is attained when strategies to enhance relevance are embedded into instruction. Means, Jonassen, and Dwyer (1997) found in their study of college students that both intrinsic and extrinsic relevance in the instructional material enhanced students' motivation to learn, although extrinsic relevance was more significant for students who lacked intrinsic interest in the subject matter.

Theories of motivation suggest that locus of control is an important mediator of motivation. Locus of control is a generalized belief about the extent to which behaviors influence outcomes in terms of success and failure (Rotter, 1966 in Pintrich & Schunk,

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1996). Theories of motivation suggest that locus of control influences learning, motivation, and behavior; learners who believe that they have control over whether they succeed or fail tend to be more motivated to learn than those who believe their actions have little effect on outcomes (Pintrich & Schunk, 1996). Wang and Newlin (2000) found that internal locus of control was one of the significant predictors of success for college students enrolled in Web-based courses.

Research suggests that learner control has significant motivational influences on online learners. According to Clark and Mayer (2003), learner control in computer-mediated learning refers to the navigational features that allow learners to select the topics and instructional elements they prefer. Learner control can be summarized into three categories in computer-mediated learning: (1) sequencing, (2) pacing, and (3) access to learning support. Yet, research findings are mixed about how much learner control should be given to motivate learners in computer-mediated learning (Alessi & Trollip, 2001).

Several studies on online learners suggest that the convenience and flexibility of online learning have a paramount influence on the learner's motivation for online learning. In a study of students in continuing professional education, McCall (2002) found that flexibility, convenience, and control (i.e., the freedom to work at one's own pace) were the primary factors that influenced their participation and perseverance in online distance courses. In another study of factors that motivate high school and community college students to choose online or traditional course formats, Roblyer (1999) found that control over pace and timing of learning was more important for those who

chose the online course format, whereas interaction with the instructor and peers was paramount to those who chose the traditional course format.

2. Affective Influences

Many researchers emphasize the importance of affective or emotional dimensions of learner motivation. Anxiety is considered one of the most important reactions to learning (Pintrich & De Groot, 1990). Excessive anxiety interferes with learning and performance, which can inhibit the continuing motivation to learn (M. P. Driscoll, 1994). Research on students in Web-based distance courses has shown that students experienced some distress in their online courses due to technical difficulties and communication breakdowns (Essex & Cagiltay, 2001; Hara & Kling, 2000). In particular, learners who take an online course for the first time are more likely to exhibit a sense of anxiety and fear, as well as excitement (Conrad, 2002). Therefore, Conrad (2002) asserts that affective influences are likely stronger for less experienced online learners than for those who are more experienced.

Test anxiety is a major source of cognitive and psychological responses for students in traditional educational settings (Zeidner, 1998). Test anxiety is a set of phenomenological, psychological, and behavioral responses that accompanies concern about possible negative consequences or failures in an evaluative situation (Pintrich & Schunk, 1996). Although there are numerous and consistent empirical research results which indicate that test anxiety has negative effects on academic performance, past studies are not conclusive about the effects of test anxiety on students' effort and persistence in their learning (Pintrich & De Groot, 1990; Pintrich & Schunk, 1996).

Past studies of computer-assisted instruction and Web-based instruction suggest that the difficulty of the learning task also has a bearing on the learner's anxiety. Past studies of computer-based instruction have shown that students' anxiety levels increase as they work on difficult learning materials and decrease when they respond to easy materials (R. E. Clark, 1994). Similarly, Reinhart (1999) found in her study of undergraduate education majors that task difficulty affects learners' motivation to learn via the Web.

Theories of motivation also suggest that interest is a psychological state that affects the learner's motivation. Interest may be defined as a person's desire or preference for interaction with something (Wlodkowski, 1998). Hence, an interested person exhibits continuing attention and a sense of delight during the interaction (Deci, 1992). Theories of motivation suggest that an individual's interest is a personal disposition (i.e., personal interest). Yet, it is suggested that characteristics of the context or situation of instruction (i.e., situational interest) also likely affect the learner's psychological state (R. C. Clark, 2003; Pintrich & Schunk, 1996). From a study of undergraduate and graduate students on their classroom learning experiences, Small, Dodge, and Jiang (1996) report that feelings of pleasure and arousal are linked to generating and sustaining the interest in the learning that the learner is currently engaged in.

Interest seems to have a bearing on persistence in learning. Persistence in learning tasks is important to be successful in self-directed instruction (R. C. Clark, 2003). Song (2000) posits that the motivation to persist is one of the major motivational categories of Web-based instruction. Motivational processes are critically important to

sustain actions and interest can lead to persistence in learning and the use of deeper

learning strategies (R. C. Clark, 2003; Pintrich & Schunk, 1996). Thus, sustaining

interest and reducing boredom are important to promote motivation to learn and

persistence in learning.

3. Social Influences

Social presence affects not only learning outcomes but also the learner's

satisfaction with a course (A. Moore, Masterson, Christophel, & Shea, 1996). Research

suggests that social presence in computer-mediated instruction can influence the learner's

satisfaction with and motivation for online learning. Gunawardena and Zittle (1997)

found that social presence was a predictor of students' overall satisfaction with computer-

conferencing courses. Frith (2001) studied online nursing students for the effects of

conversation on their learning outcomes. She found that instructional support in the form

of online communications between the instructor and students or among peers using chat

rooms, electronic mail, and discussion groups enhanced students' motivation and

satisfaction with the class. In a study of European international distance students, Visser,

Plomp, and Kuiper (1999) found that motivational communications as part of the student

support system of a distance education program that included confidence-building

statements helped distance students stay motivated.

Some studies have been conducted on the effects of teacher immediacy on

learners' satisfaction with an online course. Richardson (2001) found that students'

perceptions of social presence contributed significantly to the students' perceived

learning and satisfaction with the instructor. Tello (2002) also found from a study of 760

adult students who were enrolled in online college courses that student perceptions and

attitudes were positively correlated to the frequency of interaction between instructor and

students. In addition to the social presence of the instructor, studies have been done on

the effects of presence of an animated pedagogical agent in computer-mediated

instruction. Research results suggest that the presence of an animated pedagogical agent

promotes higher levels of engagement in learning, thereby enhancing students'

motivation to learn (Moreno & Mayer, 2000; Moreno, Mayer, Spires, & Lester, 2001).

4. Interface Design

In addition to cognitive, affective, and social influences on motivation for online

learners, interface design needs to be considered as an important factor that influences

online learners' motivation. Computer-mediated learning invokes a type of interaction

that is distinctive from face-to-face interaction; i.e., human-computer interaction

(McIsaac & Gunawardena, 1996). Human-computer interaction has some influence on

the perceptions and attitudes of individuals on their learning through the Web. In effect,

Khan (2002) argues that interface design is an important factor for creating effective

electronic learning environments. Some researchers (Lee & Boling, 1999; Sales, 1999;

Stoney & Wild, 1998) also underscore the need for user interface design that is

motivating to users for effective screen design of multimedia materials.

Researchers also suggest that user-centered design (Corry, Frick, & Hansen, 1997;

Rubin, 1994) is an important factor for the motivational design of Web sites. Subjective

satisfaction by the user is one of the goals of user-centered design (Shneiderman, 1992).

A Web site that is effectively designed tends to be appealing and to attract users'

attention; therefore, users are more likely to revisit that Web site (Arnone & Small, 1999).

Small (1997) has identified four general criteria for evaluating the motivational quality of

Web sites. She argues that motivating Web sites should be: (1) engaging, (2) meaningful, (3) well organized, and (4) enjoyable to the user.

Past studies of interaction in online learning environments suggest that interaction is an important factor for motivating online learners. Wagner (1997) argues that the learner's intrinsic motivation can increase as an outcome of online interaction. Likewise, some researchers contend that the interactivity of the medium is the key to motivating learners in multimedia materials, computer-based instruction, and Web-based instruction (Firdyiwek, 1999; Plowman, 1996; Stoney & Wild, 1998). Conrad (2002) also argues that learners' interaction with the learning materials in an online course has a significant impact on their sense of engagement with the course. In a study of a Web-based learning system for teaching computing in undergraduate-level computing courses, Rowe and Gregor (1999) found that interactive features (i.e., animated demonstrations) were the most motivating feature for students to learn in an online course. Additionally, Guzley and Avanzino (2001) found that the use of interactive medium was significantly correlated with student satisfaction in distance learning environments and that the quality of interactive medium was significantly associated with learner motivation.

Studies have been conducted of dimensions or levels of interactivity in various computer-mediated communication settings. From an analysis of business Web sites, Ha and James (1998) found that there were five dimensions of interactivity in the Web medium; i.e., (1) playfulness, (2) choice, (3) connectedness, (4) information collection, and (5) reciprocal communication. From an analysis of 110 commercial Web sites, Ha and James (1998) found that some dimensions of interactivity were more prevalent in those Web sites than others; in particular, but they found that the Web site were lacking

in playfulness (i.e., curiosity arousal) and information collection (i.e., presence of a monitoring mechanism). Kenney, Gorelik, and Mwangi (2000) adapted Heeter (1989)'s six dimensions of interactivity to develop dimensions of interactivity in interactive medium: (1) complexity of choice available, (2) effort uses must exert, (3) responsiveness to the user, (4) facilitation of interpersonal communication, (5) ease of adding information, and (6) monitor system use. Based on this framework, Kenney et al. (2000) conducted an empirical study of analyzing the degree of interactivity of online newspapers using an interactivity index that ranged from 0 (no interactivity) to 18 (very high interactivity). They found that online newspapers have low levels of interactivity. These aforementioned measures of the level of interactivity did not measure the relationship between the level of interactivity of the medium and the user motivation.

Roblyer and Ekhaml (2001) developed a rubric for assessing the level of interactivity and interaction of distance learning courses. This rubric includes four elements of interactivity; (1) social rapport-building activities created by the instructor, (2) instructional designs for learning created by the instructor, (3) levels of interactivity of technology resources, and (4) impact of interactive qualitative as reflected in learner response. This rubric assesses the level of interactivity as well as interaction (i.e., instructor-student interaction and student-student interaction) of an online course, typically the one led by an instructor.

Although interactive multimedia components can enhance the level of a learner's engagement in a Web site, research suggests that excessive use of multimedia components can have a negative impact on learning and motivation. Cognitive load theory (Hartley, 1999; Kirschner, 2002; Sweller, 1988) suggests that excessive use of

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multimedia in a Web site can lead to cognitive overload. For instance, Mayer, Heiser,

and Lonn (2001) found that an overload of the learner's visual-processing information

channel in multimedia learning can split the person's visual attention between different

sources. Also, Hartley (1999) posits that cognitive overload can interfere with students'

motivation to learn by inhibiting their attention to the instructional material.

2.2.2 External Factors

Several motivation theories underscore environmental influences on human

motivation. Environmental variables in motivation are the contexts in which the

individual learns or performs (Weiner, 1992). Herzberg (1982) studied factors that

contributed to adults' motivation to work and found that problems of motivation (i.e., job

satisfaction) stemmed from two separate and distinct factors: motivation and hygiene

factors. According to his two-factor theory of motivation, both motivational and

environmental factors contribute to enhancing job satisfaction, thereby suggesting that

one needs to take both motivational and environmental factors into account when

investigating problems associated with human motivation. Ford (1992) also emphasizes

the effects of environmental factors on human motivation for a systematic understanding

of motivation.

It is speculated that learner support has significant influence on motivation for

online learners (Keller, 1999). In particular, learner support appears to affect students'

satisfaction with Web-based instruction. A case study of adult students in a graduate-

level distance education program by Chyung, Winiecki, and Fenner (1998) found that

nearly half of the students who dropped out of an online graduate course expressed

dissatisfaction with the learning environment as the reason. Hudson, McCloud, Buhler,

Cramer, Greer, and Paugh (1998) also report that learner support for technical difficulties and for the challenges that adult learners have (e.g., lack of time and family demands) were important to serve non-traditional adult learners in their persistence in Web-based college courses. Additionally, Schramm, Wagner, and Werner (2000) found that student satisfaction with their online classes was considerably higher when students felt they had received adequate training to use the necessary technology.

The overall climate of the learner's instructional and organizational setting also appears to influence his or her motivation. Dennen and Bonk (in press) argue that the tone or climate of an online class has the potential to engage learners in the class, thereby suggesting that motivational strategies can stimulate a positive climate for learners' active participation in the learning process. The organizational climate is also an important mediator of learner motivation in workplace learning settings (Bacharach & Mitchell, 1992; Bonk, 2002). Mungania (2003) found in a study of barriers to e-learning for corporate employees that organizational support was a critical factor for the employees to engage and sustain in e-learning.

2.2.2 Personal Factors

Past studies of motivation in face-to-face instruction suggest that one's learning and motivation can be affected by personal variables. Research suggests that individuals have different characteristics and preferences that pertain to online learning (Anderson, 2001; Hills, 2003). Such individual differences also affect motivation in terms of the individual's need for achievement, locus of control, and anxiety (Pintrich & Schunk, 1996). Attribution theory also posits that personal factors play an important role in

motivation because individual differences can predict the types of attributions that people make in a new situation (Weiner, 1992).

Learning styles have garnered attention from researchers of online learning because of the potential of the Internet to deliver instruction that meets the needs of students' different learning styles. Past studies of online students indicate that learning styles have bearings on learners' motivation. Curry (1990) posits that the learner's motivation is influenced by his or her learning style together with task engagement and information-processing habits. Several other studies also suggest the importance of matching instructional strategies with the individual's preferred learning style or learning approaches in order to have a positive influence on the online student's motivation (Cuneo & Harnish, 2002; Katz, 2002; Mitchell, 2000; Sankaran & Bui, 2001).

Past studies are not conclusive about the effects of an individual's learning style preference on his or her satisfaction with and persistence in online learning. Terrel and Dringus (1999-2000) studied information science students in an online master's degree program and found that the effect of students' different learning styles on their dropout rates was not significant. Klingner (2003) also found in her study of adult learners enrolled in an online college course that the students' learning style preferences were not a significant factor in their success or satisfaction with online learning. Similarly, Stokes (2003) found in her study of college students in a Web-based module that the students' preference in learning styles did not have a significant impact on their satisfaction with the digital learning environment. In another study of adult learners who took e-learning courses in workplace learning settings, Mungania (2003) found that learning style

preference was one of seven barriers in one's starting, continuing, and completing online training.

Past studies suggest that learners can have different preferences when it comes to instructional media. Learners' media preferences can differ depending on the individual's temperament (Sherry, 2001), gender (Ley & Klein, 1993), and age (Mundorf & Brownell, 1990). Research also suggests that psychological factors play an important role in the learner's media preference. Past studies have shown that learners' perceptions of the difficulty of a medium influenced how much mental effort they expended in learning with the medium (Krendl, 1986; Salomon, 1984). Also, Cragg (1999) found that the individual's prior experience with the medium or technology influenced his or her preferences for distance education delivery methods.

2.3 Literature Review Conclusion

In summary, theories of motivation and past studies of learner motivation in distance education and computer-assisted instruction settings serve as a theoretical framework for this study. These motivational influences in self-directed e-learning are organized into three major categories of motivational influences in Web-based instruction (e.g., internal, external, and personal factors), as suggested by Song (2000).

Theories and empirical studies of motivation indicate that relevance, interest, and learner control are important to enhance cognitive engagement in learning. In addition to cognitive engagement, it is suggested that positive affective and social influences are important for motivating learners. Also, the interface design of the course Web site is important because human-computer interaction is one of the central patterns of

interactions that the learner encounters in online learning settings. The cognitive, social, and psychological influences on the learner's motivation are categorized as internal factors in this theoretical framework, because such motivational influences are caused by the features or characteristics of the course itself, which can vary depending on the course design.

In addition to cognitive, affective, and social influences on learner motivation suggested by Relan (1992), external and personal factors are added to the theoretical framework of motivational influences in self-directed e-learning. External factors need to be taken into account when diagnosing problems with learner motivation, because the learning environment is a critical component of an instructional system and theories of motivation suggest that human motivation is also influenced by external factors. Learner support and the instructional and organizational climate seem to be important external factors that influence learner motivation.

Past studies also indicate that there are personal variables that affect learner motivation. In particular, research suggests that the use of instructional strategies that match individual learning styles can have an impact on learner motivation. Also, research suggests that learners' perceptions of the difficulty of the medium and their prior experience with the medium both influence their preference of the instructional medium.

The following table summarizes possible motivating and inhibiting factors for learners in self-directed online learning environments which are synthesized from this literature review.

Table 1

A Synthesis of the Literature on Motivational Influences in e-Learning

1. Internal factors (Course Design)

(1) Cognitive Influences

- Personal interest in using technology

- Competence in using the computer and Internet skills

- Challenge

- Task difficulty

- Engaging learning activity

- Perceived task value

- Relevance to work

- Length of instruction

- Information overload

- Control over the sequence of instruction

- Feedback on student's performance

- Forgetfulness about going back to the course

(2) Affective Influences

- Test anxiety

- Frustration with technical difficulties

- Pressure of deadlines

(3) Social Influences

- Absence of instructor

- Lack of interaction with peers

(4) Interface Design and Media

- Ease of navigation

- Use of interactive features

- Use of multimedia components

2. External/Environmental Factors

- Flexibility in time and place of learning

- Learner support

- Recognition

- Disruptions while learning

3. Personal/Individual Factors

- Individual learning style

- Preference for instructional media

This review of theories and past studies that are relevant to this study has revealed the importance of motivating online learners and the need for a systematic approach to identifying design principles for motivating online instruction. Previous studies suggest that there are some motivational influences in distance education and computer-assisted instruction. Still, there is a gap in our knowledge base of instructional design principles to improve motivational quality of Web-based instruction, especially that of self-directed e-learning. Therefore, this review of literature reveals the needs for empirical study of motivational problems of learners in self-directed online learning environments, which is the aim of this study.

CHAPTER III.

METHODOLOGY

3.1 Research Design

I used two types of research design to answer the aforementioned research

questions: a content analysis and a mixed-methods research design. Descriptions of these

research methods and why these methods were selected for this study are presented

below.

3.1.1 Content Analysis

Content analysis is a research method for analyzing the meaning and the structure

of written documents in a systematic and "objectified" manner (Bauer, 2000). Content

analysis has become a prominent methodology for studying text and graphical

information displayed on the Web (Herring, 2004; McMillan, 2000). By analyzing the

content of Web sites both quantitatively and qualitatively, a content analysis helps the

researcher describe and understand information presented on the Web (Bates & Lu, 1997).

In this study, the content of course Web sites and documents published by the developer

of e-learning courses under investigation is analyzed.

The purposes of conducting the content analysis in this study are twofold. First,

the content analysis of course Web sites and documents will help the reader understand

and describe the learning environment in which the study participants were engaged

during their e-learning. With the large number of providers of e-learning courses existing

in the market today, there are also a variety of ways to design those courses. Hence, it is

important to describe the design of the e-learning courses in which the subjects of this

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study participated, in order to better understand the context of the present study and to provide the context for gauging the generalizability of this study to other settings. Second, data collected from the content analysis of course Web sites and documents will serve to triangulate the data obtained from the mixed-methods study that follows the content analysis. Triangulation is a method for enhancing the trustworthiness of a research study by obtaining data from multiple sources or by using multiple methods to obtain data (Creswell, 1999; Merriam, 1998). Thus, I expected that the data obtained from the content analysis would help validate the findings from the subsequent mixed-methods study by allowing me to interpret the data from multiple sources.

The content analysis was conducted prior to the mixed-methods study. By doing so, I expected to understand the design of the e-learning courses under investigation before I investigated the issues of learner motivation with the study participants. Understanding the design of the e-learning courses in which the study participants engaged helped me to design better research instruments and also to become better informed in investigating the issues with the participants.

3.1.2 Exploratory Mixed-Method Research Design

A mixed-methods approach was used as a primary research design in this study. In a mixed-methods research design, at least one quantitative method and one qualitative method are used in a single study. By compensating for seemingly conflicting epistemologies and methodologies, mixed-methods research can yield results that capture the best of both quantitative and qualitative research (Creswell, 1999). Mixed-methods design is also a helpful approach for triangulating data by converging quantitative and qualitative data in a study (Jick, 1983).

In this study a mixed-methods research design was used for the following reasons. First, there is a need for qualitative inquiry in this study to explore the issues under investigation. Since human motivation is difficult to observe or assess directly (Keller, 1983; Pintrich & Schunk, 1996), such an issue can be explored more deeply by using a qualitative approach, which enables a researcher to provide rich descriptions of the issues under study. Second, there is a need for an inquiry method in this study that is useful for creating a valid and reliable quantitative research instrument. In a mixed-methods research study, findings from qualitative research can aid the researcher in designing an instrument for the quantitative research when existing instruments, variables, and measures are unknown or unavailable for the population under study (Creswell, 2002). Therefore, results of the qualitative study in this mixed-methods research were expected to enhance the validity of the instrument developed for the subsequent quantitative study.

Additionally, the subsequent quantitative part of this study was expected to yield research findings that would be generalizable to the population being studied. Most qualitative research cannot be generalized since it often focuses on only one or a few cases. This is because the purpose of qualitative inquiry is not to generalize the findings but to acquire an in-depth understanding of the phenomenon under study. Accordingly, some researchers even argue that it is not desirable to generalize findings of a qualitative study in a statistical sense (Merriam, 1998). Therefore, the data collected using the quantitative research method were expected to help establishing the generalizability of the findings from this part of the study.

A mixed-methods research design can be used for one of the following purposes: (1) to converge quantitative and qualitative data for triangulation of research findings, (2)

to explore the central phenomenon using a qualitative method prior to a subsequent quantitative study, or (3) to explain research findings from a quantitative study by conducting a subsequent qualitative study (Creswell, 1999, 2002). This research study began with a qualitative study, followed by a quantitative study. In this type of research design, referred to as an "exploratory mixed-methods design" (Creswell, 2002, p. 565), the qualitative research plays an exploratory and preparatory role for the subsequent quantitative research.

The primary reason for using an exploratory mixed-methods approach in this study was to utilize the data from the qualitative study in developing a research instrument for the subsequent quantitative study. The findings from the qualitative study were expected to inform me of the motivational issues that are not addressed in the existing literature. The findings of the qualitative study were also expected to provide me with an in-depth understanding of the issues under investigation before I design the instrument for the subsequent quantitative study. The results of the qualitative study were expected to help establish the validity of the newly developed research instrument to be used for the survey study to be conducted after the qualitative study.

Within such a research design framework, qualitative interviewing was conducted in the first phase of this mixed-methods study. The purpose of qualitative interviewing was to explore themes about what influences the learner's motivation for self-directed e-learning. Interviewing is typically conducted to understand how people interpret the world around them and the experiences they have in the world (Merriam, 1998). As Patton (1990) explains, "we interview people to find out from them those things we cannot directly observe" (p. 278). Therefore, rich and in-depth descriptions of

motivational issues in self-directed e-learning could be explored in the qualitative phase

of this study as an exploratory step for the subsequent quantitative study.

A survey study was conducted as a quantitative research method in the second

phase of this mixed-methods study. Survey research serves to "describe the

characteristics of a population, which is inferred from what is found out from a sample"

(Fraenkel & Wallen, 2000, p. 432). Therefore, survey research allows the researcher to

yield research findings that are generalizable to the population of the study. In this study,

the survey is expected to enhance the generalizability of the results of the overall study

by gathering data from a larger and more representative sample than in the qualitative

phase of the study.

The interview data gathered in this study would also help me interpret the results

of the survey study. Even though survey research enables researchers to determine the

distribution of a population, this type of research is generally "not so much concerned

with explaining why the observed distribution exists as with what the distribution is"

(Franklin & Wallen, 2000, p. 432). Therefore, it is expected that the qualitative data

gathered in this study will help me better interpret the findings from the subsequent

survey study.

3.1.3 The Population of this Study

The population of this study consists of adult learners who have taken a self-

directed e-learning course. The adult learners in the population of this study match the

definition of typical adult learners as described in the previous chapter. More specifically,

the target population of this study is two groups of adult learners; one is a working adult

group, who are professionals working in various workplace settings, and the other is an

adult student group, who are senior undergraduates or graduate students enrolled in a degree program in an institution of higher education.

The sample for this study therefore was drawn from working adults and adult students in the U.S. who have taken a self-directed e-learning course. Self-directed e-learning courses developed by a major e-learning provider in the U.S. were selected as an example of self-directed e-learning courses for this study. The e-learning courses under investigation are offered by an e-learning provider who offers over 3,000 e-learning courses to 20 million learners per year worldwide. Those e-learning courses are considered to be representative of self-directed e-learning courses available to adult learners in terms of their target audience, course format, and content areas taught.

Those e-learning courses are available to adult learners for various purposes and in various instructional settings, as was described in the previous chapter. The course format is stand-alone, self-paced instruction, typically 6-8 hours in length, delivered via the Web. The topics covered in those e-learning courses include desktop applications, computer and Internet programming (henceforth, computer programming), soft skills (i.e., business and professional development), and special topics tailored to the needs of specific organizations or business fields. Some learners were able to interact with an instructor and/or technical support while they took the e-learning course if their organization had purchased such an option from the e-learning provider and made the service available to the learners. In such a case, the learners were able to communicate with course instructors or technical support staff via chat or e-mail; however, this option was not available to every learner.

3.2 Content Analysis

3.2.1 Content Analysis of Sample e-Learning Courses

Sampling Procedures

Three self-directed e-learning courses were purposefully selected as a sample to analyze the content of the e-learning courses under investigation. The sample courses were selected from among over 1,000 e-learning courses that were developed by the e-learning provider described earlier in this chapter. Those e-learning courses were made available to the study participants by their employer or the university with which they were affiliated, and all the courses were accessible on the Web.

To select a sample that was representative of the e-learning courses available to the population of the study, one course was selected from each of three topic areas (i.e., desktop applications, computer programming, and soft skills) available so that the sample represented the courses across different topic areas. Also, the sample courses were selected so that they represented courses of various difficulty levels. Thus, one basic, one intermediate, and one advanced level course were selected for the sample in this study.

The sample for desktop applications and computer programming courses was selected from over 800 e-learning courses being offered to the faculty, staff, and students in a large Midwestern university. An advanced-level course in Microsoft Word (course title: "Microsoft Word 2002 Proficient User") was selected as a sample of desktop applications courses. An introductory course in JavaScript (course title: "JavaScript Fundamentals I") was selected as a sample of computer programming courses. The sample course in the soft skills area was selected from three soft skill courses that were offered free to the public on the vendor's Web site. An intermediate-level course in

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communication skills (course title: "Business Etiquette: Communicating in Today's Workplace") was selected as a sample for the e-learning courses in soft skills.

The Analysis Scheme

I developed an analysis scheme to categorize the types of information and interactive features in the e-learning courses being studied before conducting a content analysis of those courses. To develop an analysis scheme, I first looked at the sample courses to obtain a general sense of how those courses were designed. Then, I developed categories to describe their overall structure and visual design of the e-learning courses (i.e., amount of text and graphics displayed on the Web page). This analysis scheme also included some course features that would have implications for learner motivation as suggested in the literature (i.e., interactivity and learner control). The analysis scheme was then reviewed by the members of the research committee, which consisted of experts in e-learning design and the content analysis method, to ensure the validity of this instrument. As a result, an analysis scheme that contains the following four categories was developed:

1. Overall course structure

2. Amount of textual and graphical components

3. Degree of interactivity of the course Web site

4. Degree of learner control.

Each category contains sub-categories, shown in Appendix A. The definition of each category in this analysis scheme is described below.

1. Overall course structure.

The overall course structure here refers to the instructional components that exist in an e-learning course (e.g., presentation, examples, and practice items). The purpose of analyzing the overall structure of the e-learning courses was to provide a description of the overall design of those courses under investigation and to find out if there were any instructional components in the courses that the learners found particularly motivating or unmotivating. Also, the results of this analysis would reveal if there were any dissimilarities in the design of courses across different subject areas.

2. Amount of textual and graphic components.

The amount of textual and graphic components in the e-learning course refers to the number of words and the number of graphics displayed on its Web pages. The number of words and graphics displayed on each page of the e-learning course was analyzed to provide descriptive data on how much text and graphics were used to present information in the sample e-learning courses. Additionally, it is speculated that the amount of text and graphics displayed on the Web has a bearing on readability and user satisfaction (Katz-Haas, 1998; Lynch, 2001; Nielsen, 1997).

To analyze the amount of textual information in the course Web sites, the frequency of words that appeared on the text area of the course Web pages, in which the content to be taught or instructions on learning activities, was counted. Also, the title and the bulleted points that summarized key points of the information presented on each page of the course were counted. To analyze the amount of graphical components, the frequency of images, including photos, screenshots, and graphics that appeared on each

Web site was counted. Also, the frequency of dynamic images (e.g., animations, movie clips) was counted when present.

   3. Interactivity of the course Web site.

   In this analysis scheme, interactivity was conceptualized as components of the Web site that require user responses other than turning pages. This definition of interactivity coincides with the definition of interactivity by Wagner (1994), in which she differentiates between interaction and interactivity. She argues that interactivity refers to an exchange between a human and a technology (i.e., the computer), whereas interaction refers to an exchange between or among humans.

   In this analysis scheme, interactivity is defined as the extent to which the learner interacts with the computer. Interactivity includes such activities as animations (movement of objects in response to the user's action), simulations (users responding to a set of different situations), and drag-and-drop quiz activities. The level of interactivity of the courses was analyzed by counting the frequencies of such activities in the course. Since the e-learning courses under investigation are delivered in a self-study format with minimal or no presence of an instructor, thereby not involving interactions between or among humans in most cases, the degree of interaction of the course was not analyzed in this study.

   4. The degree of learner control.

   Learner control in this analysis scheme refers to the extent to which the learner has control over the sequence and pacing of instruction, and access to learning support, as suggested by Clark and Mayer (2003). Additionally, adaptivity - i.e., the degree to which instruction can be customized to the learner - was added as another component of learner

control. The sample courses were analyzed in terms of whether they had features that

allowed the learner to control the sequence and the pace of instruction, whether the

course provided the learner with access to learning resources, whether it allowed the

learner to ask questions, and whether it allowed the learner to customize some features in

it (e.g., adapting display options to the one that fits the learner's preference). The

presence or absence of those four features of learner control in the sample courses was

recorded in a yes or no format to analyze the degree of learner control in those courses.

3.2.2 Content Analysis of Course Design Documents

In addition to analyzing the content of e-learning courses, the documents provided

by the developer of the e-learning courses under investigation were analyzed. The

purpose of this document analysis was to find information relevant to the design of e-

learning courses to collect data about the design of e-learning courses under investigation

from multiple sources. To that intent, I looked into documents published by the provider

of the e-learning courses being studied and found information that pertained to the design

of its e-learning courses in those documents.

3.2.3 Data Collection and Analysis

The content of the sample e-learning courses was analyzed using the analysis

scheme described earlier in this chapter. Since two of the sample courses (the desktop

applications course and the computer programming course) consisted of over one

hundred Web pages with 6-8 hours of learning time to complete the course, I was not

able to analyze all the content in those sample courses due to time limits. Hence, three

lessons in each course were purposefully selected for the analysis of these two sample

courses. The sample soft skills course - i.e., the intermediate communication skills

course – had less content with 2-4 hours of learning time; thus, I decided to analyze the whole content for the sample soft course.

The sample e-learning courses were divided into several lessons within the course; the advanced Microsoft Word course contained 9 lessons, the introductory JavaScript course contained 7 lessons, and the intermediate communication skills course contained 3 lessons. One lesson typically included 3-9 units and generally consisted of 100-150 Web pages. Three lessons were selected from a beginning, middle, and end part of the course to obtain a representative sample from the course, except for the communication skills course, for which the whole content of the course was analyzed. As a result, 537 Web pages were analyzed in the Microsoft Word course, 492 Web pages from two lessons were analyzed in the JavaScript course, and 264 Web pages were analyzed in the communication skills course.

To begin analyzing the content of the sample e-learning courses, I first registered for the courses by logging on to the course management system. Then I was able to launch the course Web site on any Web browser on any computer platform. Upon launching the course, I navigated to the lessons that I wanted to analyze using the course map on the course Web site. I counted the frequencies of the components of the course content as in the analysis scheme by hand and recorded them on paper, which was later entered into an electronic (e.g. computer) file. I recounted the frequencies later to check for accuracy of the results of data analysis.

The content analysis was also conducted on documents published by the developer of the e-learning courses under investigation. One Web page that documented the list of e-learning courses available from this e-learning provider and two other reports

by the e-learning company that documented its philosophy and approaches to designing learning courses were analyzed for this study. Those documents and Web page were available free to the public from the company's Web site. As a result, some qualitative data that described the overall instructional design approach of the e-learning courses under investigation and the list of interactive features embedded in these courses were obtained.

3.3 Interview Study

3.3.1 Participants

The sample for the qualitative inquiry phase of the present study was drawn from over 2,000 working adults and adult students who registered for a self-directed e-learning course in the spring of 2004, which was retrieved from the user database of the e-learning provider. From that user list, about 100 people were selected to obtain a representative sample of the population in terms of profession, gender, e-learning experience, and the topic of the course taken.

To be consistent with the population of this study, the interview participants were selected from two target groups: the adult student group and the working adult group. Participants from the adult student group were drawn from students enrolled in a large research university in a Midwestern state, who were located across several campuses around the state. Participants from the working adult group were drawn from employees in different types of organizations located around the United Sates. Learners from three different types of organizations (i.e., non-profit, university, and business organizations) were selected to represent learners in various workplace settings.

A purposive sampling method was employed to draw the sample for this interview study. In the purposeful sample method, it is suggested that the sample be drawn based on specific criteria upon which the researcher can determine from whom he or she can learn the most about the phenomenon being studied (Creswell, 1998; Patton, 1990). Therefore, I selected the sample for this interview study based upon specific criteria so that the subjects were comprised of those with diverse backgrounds or characteristics in terms of: (1) majors or job functions, (2) computer skill levels, (3) prior experience with computers and online learning, (4) gender, and (5) the topic of the course that they took.

I contacted 100 prospective study participants via e-mail soliciting their participation in the study, and about twenty people agreed to participate. Interviews were conducted until the collected data reached "the saturation of categories" (Lincoln & Guba, 1985, p. 350) – i.e., until no additional data yielded new categories. As a result, twelve individuals, including six working adults and six adult students, were interviewed. Seven of them were females and five were males; their ages ranged between early 20s and late 40s.

The working adults who participated in this study were holding a full-time job in corporate, university, or non-profit organizations in the Midwest and the Southwest regions of the United States. These adult learners were holding various job functions (e.g., consulting, IT, training) and the size of their company also varied. Two senior undergraduate students and four graduate students were interviewed as a sample of the adult student group. Three of the adult students were part-time students with a full-time job; the other three were full-time students with or without a part-time job. They were

enrolled in various academic programs (e.g., business, computer science, education) in several campuses of a Midwestern university.

Most of the participants had experience with online learning to some extent; five of them had taken one to three e-learning courses offered by the e-learning developer under investigation and another four had taken online courses in a college or university. The participants also had computer competency of an intermediate or advanced level, which was assessed by asking them how many software programs they were using on a regular basis and whether their job function was related to computer or Internet technologies.

3.3.2 The Qualitative Instrument

A semi-structured interview method was used for this qualitative interview study. Fifteen open-ended questions were asked to participants to explore issues regarding their motivation for self-directed e-learning. A few questions on the participant's background and experience were asked at the beginning of the interview, followed by some leading questions (see Appendix B). The leading questions included the participants' motivation to begin self-directed e-learning, their persistence in self-directed e-learning, and their motivation to continue this type of learning in the future.

The leading questions for this interview study were formulated based on the research questions and they served to gather qualitative data for the following purposes: (1) to describe how learners' motivations change as they go through self-directed e-learning, and (2) to identify learners' perceptions of motivating and inhibiting factors in self-directed e-learning.

3.3.3 Qualitative Data Collection

The interview procedures were guided by an interview protocol, as seen in Appendix B. The purpose of using an interview protocol was to aid the investigator in administering and recording the interviews, as suggested by Creswell (2002). The interview protocol consisted of three parts: introduction to the interview, leading questions, and the concluding session. In the introduction section, the purpose of the study and the information on the confidentiality of the participant's responses were explained. The second section of the interview protocol included leading questions, which consisted of twelve open-ended questions. This section also contained space for me to make notes on the comments made by the participant. The last section of this interview protocol included information to be given to the participant at the end of the interview, including the possibility of follow-up interviews and a reminder of the confidentiality of the participants in this study. In addition, the participants were asked to make any further comments or to ask questions if necessary in concluding the interview.

I administered two pilot interviews of one adult student and one working adult in February of 2004. The purpose of conducting pilot interviews was to test the research instrument (e.g., the interview questions) in order to increase the clarity of the questions, thereby enhancing the likelihood of eliciting desired information from the interviews. As a result, the leading questions were revised before the interview was implemented on a full scale. Another purpose of the pilot interviews was to familiarize the investigator with the interview procedures. With this intent, I conducted two different types of interview in the pilot interviews, i.e., one face-to-face interview and one phone interview,

in order to familiarize myself, as the administrator of the interview, with both interview types that would be employed in this study.

I conducted one-on-one interviews from March through June of 2004. Eight participants were interviewed in person and four participants who were located at a distance from the investigator's location were interviewed via phone. In-person interviews were held either in a conference room on campus or the participant's office room, all of which were quiet rooms. Phone interviews were conducted at the participant's convenience, either at his or her office or home. I conducted the interviews following the procedures in the interview protocol. I also took notes of the main points of the participant's comments on the interview protocol sheet during the interview. Each interview took between 30 and 45 minutes and was audio taped. The recorded interviews were later transcribed verbatim for analysis.

After conducting each interview, I listened to the audiotape and read the notes that I took during the interview. I took notes of additional information that I wanted to seek. Follow-up questions were asked via e-mail to some of the interview participants after the interview to elicit additional information to the initial interview and also to verify the accuracy of my understanding of the information collected from the interviews.

3.3.4 Qualitative Data Analysis

A qualitative content analysis (Merriam, 1998) was conducted of the verbatim transcript of recorded interviews, to analyze the data gathered from the qualitative interviewing. An analysis was conducted of the interview transcripts in order to identify emerging themes or patterns from the data following the qualitative inquiry procedures

suggested by Lincoln and Guba (1985). A more detailed description of the data analysis procedures follows.

Data Unitizing and Categorizing

The data analysis was conducted concurrently with the data collection process. I began an initial data analysis process by scanning the interview data (i.e., reading over the transcripts to get a sense of emerging themes from the data) and taking notes of emerging themes of each interview while the interviews were under way. After all the interviews were conducted and transcribed, two data analysts, the principal investigator and an external data analyst, took two to three days to carefully read the transcripts from beginning to end. By scanning the data, the analysts were able to gain a general understanding of the phenomenon under study, thereby, as Merriam (1998) states, "making sense out of the data" (p. 178).

After the initial analysis of the data, I unitized the data by identifying each sentence or group of sentences from the interview scripts that had meaningful information and wrote each of them down on index cards. The data were unitized following the guidelines by Lincoln and Guba (1985), which are: (1) "the unit should reveal information relevant to the study and stimulate the reader to think beyond the particular bit of information," and (2) "it should be the smallest piece of information about something that can stand by itself" (p. 345). Accordingly, a paragraph in the transcript that consisted of more than one piece of information was split into several units, so that each unit contained a disparate piece of information. As a result, 142 index cards (i.e. 142 data units) were produced.

After the data were unitized, two data analysts sorted the data units into categories to identify emerging themes from the interview data. The data analysts read each index card together and sorted the cards with a similar theme into one group. Any discrepancy between the two analysts was discussed until an agreement was reached. As a result, all of the index cards were sorted into six categories. The analysts then labeled each category and read the index cards again to see if there was any data unit that did not fit into the category. Some index cards were placed in other categories as a result, but the categories themselves did not change.

Member Checks

Member check is a means to establish the credibility of qualitative inquiry by testing the interpretations of qualitative data with those from whom the data were originally obtained (Lincoln & Guba, 1985). To that end, I sent each interview participant a copy of the transcript of their interview and the results of initial data analysis for their review and comments. Some participants sent me feedback on the interview transcription via e-mail and corrected any errors in it. By doing so, I provided the participants with an opportunity to correct any errors and misconceptions that I had about the information that I gathered from the interviews.

External Audit

Upon the completion of the initial data analysis, an external auditor reviewed the results of the initial data analysis to evaluate the trustworthiness of this qualitative inquiry. I debriefed the external auditor on the purpose and design of this research study prior to his audit. I also debriefed him on the purpose and the process of conducting an external audit for an qualitative inquiry outlined by Lincoln and Guba (1985). This debriefing

session for the external auditor took about two hours. Afterward, the auditor was given a hard copy of interview transcripts and initial data analysis results. The auditor reported back the results of his audit two weeks after the debriefing. The auditor agreed with the findings of the interview study but suggested some changes in the wordings of the labels of some categories for more clarity. Some wordings of the category labels were changed as a result.

3.3.5 Trustworthiness of the Qualitative Study

Many qualitative researchers argue that validity, reliability, and objectivity are the paradigms of a positivist epistemology of quantitative research and therefore are not comparable with the paradigms of qualitative inquiry (Denzin & Lincoln, 1998; Lincoln & Guba, 1985; Watling, 2002). Lincoln and Guba (1985) suggest trustworthiness as a means to determine the quality of qualitative inquiry. They suggest that trustworthiness of a qualitative study can be judged by four criteria: credibility, transferability, dependability, and confirmability. In the following, I will describe how I addressed these criteria for establishing the trustworthiness of this qualitative research.

Credibility

Lincoln and Guba (1985) suggest that such activities as peer debriefing and member checks are the means to establish the credibility of qualitative research, which refers to how believable or truthful the findings of the research are. In this study, peer debriefing was conducted through an external audit and member checks were conducted to check for the truthfulness of the findings of the study. Triangulation (Merriam, 1998) was also pursued by using multiple sources of data, which were gathered from the content analysis, interviews, and the survey.

Transferability

Transferability refers to the degree to which findings of a qualitative inquiry can be applied to other settings (Lincoln & Guba, 1985). Thick description (Merriam, 1998) of the phenomena under study was pursued in this study to provide readers with a base upon which they can judge the transferability of the findings of this study. I made efforts to provide thick descriptions of the issues under investigation by providing detailed information on the self-directed e-learning courses that the participants of this study took and the contexts in which the participants took the courses.

Dependability and Confirmability

Dependability and confirmability are mainly concerned with whether the results of qualitative research are consistent with the data collected and whether the instrument is reliable (Seale, 1999). An external audit can be used to establish the dependability and confirmability of qualitative research (Lincoln & Guba, 1985). An external auditor judged the trustworthiness of this qualitative study by reviewing it on the following points suggested by Lincoln and Guba (1985); (1) inferences based on the data are logical, (2) appropriate analytical techniques are used, (3) categories are labeled appropriately, (4) interpretations of data are appropriate, and (5) whether there could be equally attractive alternatives.

In terms of instrument reliability, human instruments can become more reliable through training and practice (Merriam, 1998). Since the researcher is the primary instrument in qualitative inquiry (Lincoln & Guba, 1985), it was important that the investigators in this study were properly trained. I conducted pilot interviews to practice the data collection procedures and techniques prior to actual qualitative data collection.

Also, other investigators in this study (a data analyst and an external auditor) were trained on the analytic techniques and the audit process before they began the procedures. Those investigators were advanced doctoral students and had some experience in qualitative research during their doctoral training.

3.4 Survey Study

3.4.1 Sampling Procedures

The sample for the quantitative inquiry phase of this study was drawn from the population of adult learners who had taken a self-directed e-learning course in various education and training contexts. The sample included working adults in various types of organizations who were located around the United States. Also included in the sample of this survey study were undergraduate and graduate students enrolled in universities around the United States. A purposive sampling method was used to collect data from the learners of diverse backgrounds: a random sampling approach could not be used in this study because information about the individuals in the population was unavailable.

Several listservs that adult learners in formal education settings belonged to were selected to draw a representative sample of the adult learners in informal education settings. Additionally, two organizations that offered the e-learning courses under investigation were selected and an online forum that adult learners in corporate training settings belong to was selected purposefully to draw a representative sample of adult learners in corporate training settings. A message inviting people to participate in this study was posted on those forum and listservs with permission from the moderators of

those online communication groups. More detailed description of the sampling

procedures will be provided in the quantitative data collection section later in this chapter.

3.4.2 The Survey Instrument

Instrument Development

A survey instrument (i.e., a questionnaire) was constructed to collect quantitative

data in this study. A new survey instrument was developed by undergoing the following

three steps to ensure its reliability and validity. First, a preliminary survey instrument

was designed based on the theoretical framework that was developed from the review of

literature, which was described in the previous chapter. Second, the preliminary

instrument was modified after the qualitative inquiry phase of this study was completed

in order to include additional motivational factors in self-directed e-learning that were

identified from the results of the qualitative research. Third, the survey instrument went

through another modification after a pilot study was conducted of this newly developed

instrument in order to enhance its reliability.

The resulting survey instrument has 60 questions, with 59 multiple-choice

questions and 1 open-ended question and is divided into three sections (see Appendix B).

In the first part of the survey instrument (questions 1-13), questions about the

respondents' backgrounds are asked. In more detail, question items 1-8 ask the

respondents' demographic information and question items 9-13 ask their motivation for

taking a self-directed e-learning course. Information gathered from these question items

was intended to help me investigate individual differences in the respondents'

motivational levels (research question #3).

The second part of this survey instrument (question items 14-46) includes 33 Likert-type questions to measure the respondents' perceptions of motivational influences in their self-directed e-learning. These question items ask respondents to rate on a 5-point Likert scale how important each factor has been for their motivation to persist in their self-directed e-learning and to continue self-directed e-learning in the future. The rating choices ranged from "strongly disagree" to "strongly agree." This part of the survey instrument was designed with four a priori scales, which were personal factors, internal factors, external factors, and relevance (see Table 2).

The questionnaire was published on the Web for faster and easier access for the respondents than could be expected from a paper-based survey. This Web-based survey was designed to help minimize the respondent's boredom and fatigue from reading lengthy texts on the computer screen. This questionnaire was divided into five pages to make the length of the page short, which was expected to help alleviate the respondent's fatigue, which may cause a low response rate (Monson, 2003). In addition, a visual aid indicating the user's progress on the survey was displayed on each survey page to help users identify their progress toward the completion of the survey.

Pilot Test of the Instrument and its Reliability

A pilot survey was conducted prior to the implementation of the survey instrument to determine the appropriateness of this newly developed instrument and the study procedures in order to make any necessary revisions before full implementation of the study. The sample for the pilot survey was selected randomly from a pool of about 300 adult learners who took self-directed e-learning courses in the spring of 2004. Sixty adult students and adults working in a university were randomly selected and were

contacted via e-mail soliciting their voluntary participation in the survey (see Appendix

C). The e-mail message also included information on the purpose of the study and the

address of the survey site.

Participants began the survey by clicking the address to the survey site. The

Web-based questionnaire is presented in Appendix D. Due to the nature of the Web-

based survey, participants were allowed to take the survey at any time and at any place on

any computer with an Internet connection within the two-week time period the survey

was open. Once the participant opened the survey site on a Web browser, he or she

would see the study information page, including the information on his or her rights as a

human subject and on the anonymity of the study participants, before beginning the

survey. After they read the study information page, participants were given an option to

choose not to participate in the survey in order to guarantee their voluntary participation

in this study.

A high non-response rate can cause bias in results from survey research, since

those who do not respond may answer differently from those who do respond (Fraenkel

& Wallen, 2000). To induce participation in this study, a monetary reward was offered to

those who returned the survey. As a result, 20 people returned the survey, yielding a 33

percent response rate. Because this was a pilot survey, no attempt was made to increase

the response rate by sending a reminder to those who did not complete the survey.

A test of reliability on this survey instrument was conducted on the data obtained

from the pilot survey. Reliability of a research instrument refers to the "consistency or

stability" of scores obtained by administering the instrument (Johnson & Christensen,

2000, p. 100). Cronbach's alpha was performed on three a priori scales in this instrument,

which were conceptualized from the theoretical framework through the review of relevant literature (i.e., personal factors, internal factors, and external factors), to measure internal consistency of those scales.

The preliminary survey instrument had only one item on relevance and the results of reliability analysis showed that this item had no strong correlation with any of the three a priori scales in the instrument. To address this issue, I decided to add a new scale on relevance to this survey instrument by including more items on relevance. To do so, three items on relevance were adapted from an existing motivational questionnaire developed by John Keller, the Instructional Materials Motivation Survey (IMMS), were added to the preliminary instrument. After adding a new scale on relevance to this survey instrument, the instrument contained four a priori scales.

Table 2 summarizes the four a priori scales in this survey instrument and the reliability coefficient on each scale. It is generally accepted that a reliability coefficient over .80 is a high level of reliability (DeVellis, 2003). The reliability coefficients of the scales in this survey instrument ranged from .78 to .81, which fell into an acceptable range of values according to the guidelines on acceptable reliability levels by Devellis (2003).

Table 2

A Priori Scales on Motivational Influences in the Survey Instrument

Scale	Question Items	Reliability Coefficient
Personal Factors	16, 22, 23, 26. 27, 31, 33, 40, 41	.79
Internal Factors	17, 18, 20, 28, 29, 34, 35, 38, 39	.80
External & Social Factors	21, 24, 30,32, 36, 37	.78
Relevance	14, 27, 35, 44	.81

These scales were a priori in a sense that they were developed from a conceptual framework, not from a statistical analysis such as a factor analysis. I did not attempt to run a factor analysis of the data obtained from the pilot survey due to its sample size. The number of cases from this pilot survey, which was 20, was too small for one to employ inferential statistics such as factor analysis on it. Therefore, these a priori scales may be different from those that will be identified from a factor analysis which will be performed with a larger dataset collected from the actual survey.

Instrument Validity

The quality of instruments used in a study is important because the researcher draws conclusions on his or her study based upon the information that he or she obtained using the instruments (Fraenkel & Wallen, 2000). The validity of a research instrument refers to whether it serves the purpose; in other words, whether it measures what it was intended to measure (Johnson & Christensen, 2000). There are several approaches to establishing the validity of a quantitative research instrument, and I adopted a content-

related criterion (Fraenkel & Wallen, 2000) to establish the validity of the instrument that I developed for this survey study - that is, by addressing the content validity and the face validity of the instrument.

To ensure content validity (Johnson & Christensen, 2000) of this survey instrument, several experts in motivation and the research method reviewed the instrument and provided feedback on it in the early and late stages of the instrument development process. Four members of the research committee reviewed the instrument and gave me feedback for improvement. In addition, three scholars who have expertise in the theories of motivation but were not members of the research committee reviewed the instrument. Also, content validity of this instrument was established by a careful and extensive review of the literature. The review panel also provided feedback on the wordings of the question items to improve the instrument's face validity.

In addition to the content-related criterion for instrument validity, it is important to address the reliability of an instrument. Ensuring the reliability of an instrument is a necessary condition to its validity because an instrument cannot be valid if it is not reliable (Fraenkel & Wallen, 2000). The pilot test of this survey instrument was conducted to measure the reliability of its scales and it was proven to have an acceptable range of reliability levels, as described earlier in this chapter.

3.4.3 Quantitative Data Collection

The actual survey was conducted in the spring of 2005. A sample of approximately 800 adult learners was selected from working adults and adult students around the United States. About 400 learners of self-directed e-learning courses were selected from those who were working professionals or students in formal education

settings. Also included in the sample of working adults were faculty or staff members at a university who were members of a division in a professional organization in education who were located around the United States.[2] An e-mail message was posted on the listserv for the members of this particular division of the organization to invite them to the survey. Also included in the sample were students who were enrolled in four different academic programs – i.e., education, information and library science, English, and telecommunications - in a large Midwestern university. Students from four academic disciplines were selected to draw a sample representative of students in various disciplines. These students were invited to the study via the listserv in their academic departments. The names of individuals who participated in this survey and the names of organizations that these individuals were affiliated with remained anonymous throughout the study and also in reporting the results in this paper for the purpose of confidentiality as was informed to and agreed by the study participants on the study information section of the questionnaire (see Appendix D).

About 400 learners of self-directed e-learning courses were also selected from working professionals in various workplace settings. To draw a sample from adult learners in business settings, three client organizations of the e-learning provider were randomly selected and 300 employees in those organizations who took e-learning courses between the fall of 2004 and the spring of 2005 were selected. Additionally, about 100

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[2] This particular division of the professional organization had about 600 members, which comprised mostly of faculty members, administrators, and graduate students in colleges and universities. Only those who had taken a self-directed e-learning course were asked to participate in the survey. No information was available as to how many members in this group had taken e-learning courses.

working adults who logged on to an online discussion forum on a Web site of a professional organization of education and training professionals participated in this survey to draw a sample of adult learners from various workplace settings.

The actual survey study went through the same procedures as did the pilot survey, which were described earlier in this chapter. Thus, participants received an e-mail soliciting their participation in this study with the address to the survey site. The e-mail message was sent to the participants again a week after the survey was sent out to remind them to respond to the survey (see Appendix D for the survey instrument). As a result, 368 returned the survey, yielding approximately a 46 percent response rate. The data, which were stored on the Web server, were retrieved from the server and transferred to SPSS for statistical analyses.

3.4.4 Quantitative Data Analysis

Several statistical techniques were employed to analyze data from the survey study. This section describes the statistical techniques and procedures used for the quantitative analysis in the present study.

Descriptive Analysis

Descriptive statistics (e.g., means, standard deviations, and frequencies) were performed to analyze the respondents' demographic data and to describe the participants' backgrounds in e-learning. Descriptive statistics were also employed to describe the respondents' motivations for starting self-directed e-learning and the change in their motivational levels as they went through the e-learning courses.

Chi-Square Test (χ^2)

Chi-square tests (i.e., Pearson's chi-square) were performed to determine whether two frequency distributions among groups in the population being studied differed significantly from each other. Frequency distributions were analyzed for the demographic data and the data on respondents' e-learning backgrounds to understand the characteristics of the studied population. A cross-tabulation (i.e., a contingency table) was created of the variables that were found to be significantly different in the frequency distributions to further analyze the differences between the groups. A chi-square probability of .05 was used to determine the statistical significance in the differences in frequency distributions.

Correlation Analysis

Correlation analysis was performed to investigate the relationship between the learner's motivational level and the factors that influenced the learner's motivation. The results of correlation analysis shed light on which factors significantly influenced the learner's motivation. The Pearson product moment correlation coefficient (r) was calculated on ordinal variables to determine whether significant relationships existed between the variables under investigation. A statistical significance of the correlation between two variables was determined at the .05 significance level.

Analysis of Variance (ANOVA)

One-way ANOVA was performed to investigate the differences in the respondents' motivation for self-directed e-learning across groups of different demographics and e-learning backgrounds. Post-hoc comparisons were performed on the variables that had significant differences in the means among the groups of three or more

in order to find out in which groups the differences were significant. The Tukey HSD test was employed for the post-hoc tests in the present study because it is a conservative test and, therefore, is effective in controlling Type I errors (Kirk, 1995).

Exploratory Factor Analysis

A factor analysis was conducted of the Likert-scale items to analyze the respondents' perceptions on motivational factors in self-directed e-learning. A factor analysis reduces the number of variables by grouping those that are moderately or highly correlated with one another into a factor, thereby allowing the researcher to describe variables by a few factors (Fraenkel & Wallen, 2000). Thus, a factor analysis was employed in the present study to reduce the number of variables on motivational factors in self-directed e-learning to a few underlying factors. A reliability analysis on each factor was performed to check for its internal consistency. The factor analysis in the present study was an exploratory approach in that the results of the factor analysis were used for a multiple regression analysis, which is described below.

Multiple Regression Analysis

A multiple regression analysis was performed to identify which factors significantly contributed to predicting the learner's motivational change – i.e., the difference in the learner's motivational level before and after he or she engaged in self-directed e-learning. Thirteen variables that were of interest in the present study were used as independent variables with motivational change being a dependent variable. The independent variables entered in this multiple regression analysis included demographic variables, the variables on the respondent's e-learning backgrounds, and the motivational

factors for self-directed e-learning that were identified from the exploratory factor analysis, which was performed prior to the regression analysis.

A general stepwise regression method was employed to identify independent variables that significantly contributed to predicting the learner's motivational change and also to investigate which variable explains or predicts the learner's motivational change more strongly than others. The stepwise regression method was used in the present study because the stepwise regression allows the researcher to explain the factors that significantly contribute the variance in the dependent variable in a parsimonious way by excluding the independent variables that do not provide additional prediction from the regression equation (Tabachnick & Fidell, 2000).

CHAPTER IV.

THE CONTENT AND DESIGN OF SELF-DIRECTED E-LEARNING COURSES:

RESULTS OF THE CONTENT ANALYSIS

4.1 Findings from the Content Analysis

4.1.1 The Course Structure

The sample desktop applications course (an advanced Microsoft Word course) consisted of nine lessons covering such topics as enhancing the layout of documents, adding visual enhancements to documents, and using mail merge and collaboration tools. The sample computer programming course (an introductory JavaScript course) consisted of seven lessons covering such topics as an overview of JavaScript and an introduction to JavaScript objects. The sample soft skills course (an intermediate communication skills course) contained three lessons covering topics on making introductions and conversation, communicating in today's workplace, and using etiquette in communication.

There were some similarities and differences in the overall structure across the sample e-learning courses. All three courses incorporated three instructional components: (1) presentation, (2) examples, and (3) practice with feedback. Each lesson included an introduction to the lesson (i.e., stating lesson objectives), lectures, examples, practice items, the lesson summary, and assessments. The pre-assessments in the beginning of the Microsoft Word and the JavaScript courses allowed the learner to skip lessons covering topics he or she had already mastered based upon his or her performance on the assessment. Such a feature was not available in the soft skills course. The post-

assessments gave the learner feedback on his or her performance in each lesson and were available in all three courses.

The design of the sample soft skills course was different from the other two courses in that it included a simulation section at the end of every lesson. The simulation section served as a practice item in which the learner applied what he or she learned in the lesson, as shown in Figure 1. In this simulation, the learner is put in a situation where he or she speaks with other people in a workplace setting. The learner is asked to choose an appropriate response to the other speaker in the given situation. The learner receives feedback on whether he or she made the right choice and the feedback helps the learner walk through the sequence of steps that he or she needs to perform to successfully complete the practice item.
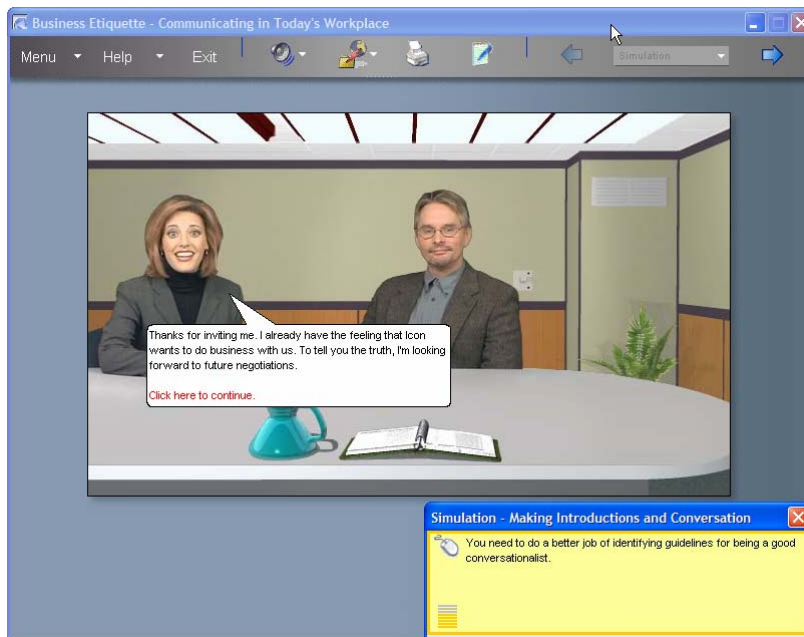
Figure 1. A screenshot of simulation in the sample soft skills course.[3]

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[3] The screenshots appear in this manuscript were used with permission from the provider of the e-learning courses under investigation.

4.1.2 The Amount of Textual and Graphic Components

The course content and instructions for the learner in the sample e-learning courses were delivered as text. A small, movable text box appears on every page of the course, providing the learner the content and instructions to go through the lessons (see Figure 2). A summary of the information given in the text box can also appear in the major section of the screen along with supplemental graphics, as illustrated in Figure 2. The number of words both in the text box and on the major section of the screen was counted to determine the average number of words per page in the sample e-learning courses.
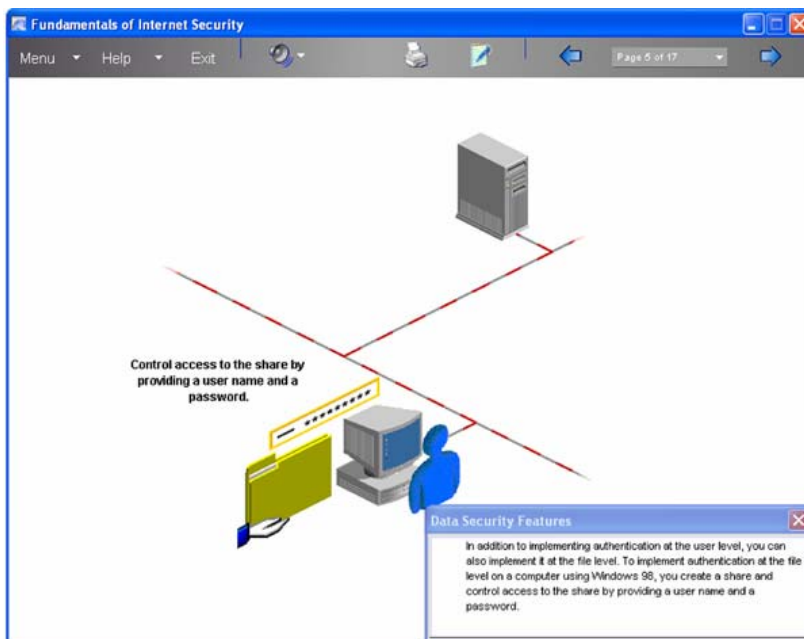
Figure 2. An example of course page with text and graphics.

In the sample desktop application course, the average number of words per page was 30, and the average number of pages per lesson was 48. The average number of words per page in the sample computer programming course was 33, with an average of 36 pages per lesson. The sample soft skills course had an average of 46 words per page,

and the average number of pages per lesson was 50. Table 3 summarizes the average number of words in each page of the sample e-learning courses, together with the average number of pages per lesson in each course.

It should also be noted that the learner has an option to listen to the information displayed as text, so the person who chooses the audio option may not have read the texts on the screen. The texts written in the text box are narrated by a human voice when the learner chooses the audio option. Female and male voices are used in an alternating way throughout the course to minimize boredom caused by listening to the same tone of voice. The text remains on the screen when the learner selects the audio option, thereby allowing the learner to both read and listen to the information given on each page of the course.

The amount of graphic components in the sample e-learning courses was analyzed by counting the frequencies of both static and dynamic images appearing in the course. In the desktop applications course, there was an average of 1.0 graphic per page. There was an average of 0.6 graphic per page in the computer programming course. The average number of graphics per page in the communication skills course was 0.9. The type of static images appearing in the courses included illustrations, photos, and screenshots. There were no dynamic images (animations, movie clips, etc.) in the sample e-learning courses. Table 3 summarizes the average number of graphics per page in the sample e-learning courses.

Table 3

Amount of Textual and Graphic Information in Sample e-Learning Courses

	Desktop Application Course	Computer Programming Course	Soft Skills Course
Average Number of Words per Page	29.7 words / page	33.13 words / page	45.66 words / page
Average Number of Graphics per Page	1.0 graphic / page	0. 58 graphic / page	0.89 graphic / page
Average Number of Pages per Lesson	48 pages / lesson	36 pages / lesson	50 pages / lesson

4.1.3 Interactivity

The frequency of interactive features in the sample e-learning courses was analyzed to investigate how interactive those courses were. A document published by the developer of the courses under investigation indicates that they contain several types of interactive activities, including clicking radio buttons, dragging and dropping items, typing specified lines of code or labeling items, and participating in simulations. The level of interactivity of the sample e-learning courses was analyzed by counting the frequencies of such activities in the course.

Results of the content analysis indicated that the level of interactivity was different across topic areas of the e-learning courses. The desktop applications course had the most interactive features, with an average of 0.6 interactive features per page. The communication skills course had an average of 0.3 interactive features per page. The

computer programming course had the least interactive features with 0.1 interactive

features per page. These findings indicate that interactive features were used sparsely

across the sample e-learning courses, especially in the computer programming course.

The type of interactive features found in the sample desktop applications course

included animation of the actual computer screen. In other words, the learner could

practice how to use a certain feature in Microsoft Word (i.e., drawing an object using the

Drawing tools) by clicking on the area of the screen where a screenshot of the actual

program workplace was displayed, as seen in Figure 3. When the learner clicks on the

appropriate command to perform the given task, the computer screen shows the next

action that would take place as if the learner were using the actual program. If the learner

clicks on an inappropriate option, the learner sees a feedback message indicating where

he or she should click to perform the task correctly. Such animated activities appeared on

seven pages on average in each lesson in the advanced Microsoft Word course, which

contained an average of 48 pages per lesson. Animations were used in practice items

presented at the end of a unit (e.g., a section within a lesson) in the sample desktop

applications course. Four simulation activities appeared in the sample soft skills course,

which consisted of two lessons.
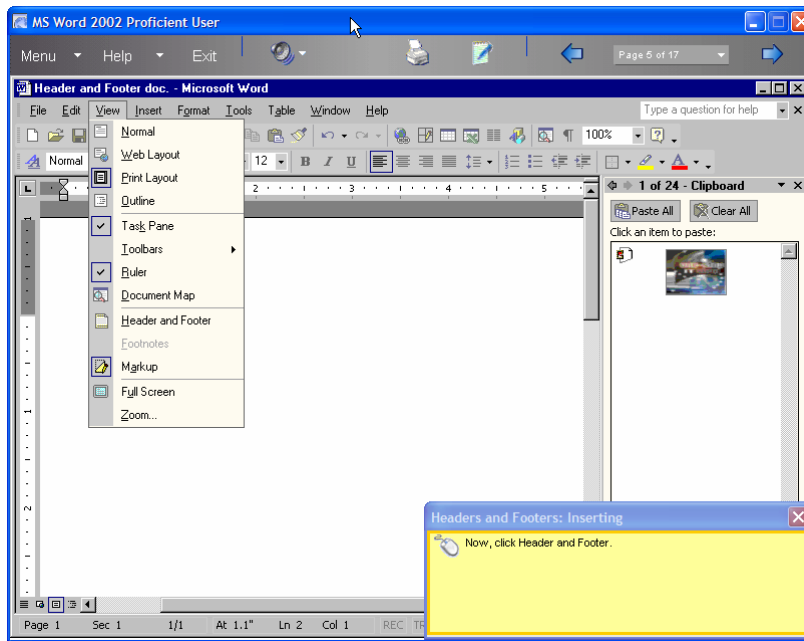
Figure 3. A screenshot of animation in the sample desktop application course.

Other interactive features in the sample e-learning courses included: (1) drag and

drop activities, (2) multiple-choice questions, (3) typing-text questions, and (4)

simulations. In drag and drop activities, the learner responds to a question by choosing

an item and dragging its box to another box containing a response to the question. These

drag-and-drop activities were used in practice items across the courses; there were four

drag-and-drop activities in the sample desktop applications course and two such activities

in the sample computer programming course (see Table 4). The computer programming

and soft skills courses also included multiple-choice questions, in which the learner

chooses an answer from a range of responses to a question and receives feedback on the

correctness of his or her choice. Multiple-choice questions appeared on three pages in

the desktop applications course and on four pages in the soft skills course. In typing-text

activities, the learner is asked to type the correct answer to some questions as practice

items. Such activities were found on four pages in the sample computer programming

course; typing-text activities were not found in other sample courses. Simulations were also used in some of the practice items in the sample soft skills course, as described earlier in this chapter. There were two simulation activities in the sample soft skills course, comprising 10 pages in total.

Table 4

Interactive Features Used in Sample e-Learning Courses and their Frequencies

	Computer		
	Desktop Application course	Programming Course	Soft Skills Course
Interactive Features			
Simulation	0	0	10
Drag and Drop Activities	3	2	0
Type in the Correct Answer	0	4	0
Multiple-Choice Questions	0	3	4
Animation	24	0	0
Total	27	9	14
Average Number of Interactive Features	0.63/page	0.09/page	0.28/page

In conclusion, a variety of interactive features were used in the sample e-learning courses, yet they were used sparsely across the courses being studied. Additionally, those

interactive features generally appeared in practice items across the sample courses and were not used to present the information covered in the lesson.

4.1.4 Learner Control

The e-learning courses under investigation provide learners with options to control the sequence of instruction by allowing them to skip or repeat parts of the instruction. This feature also offers learners the opportunity to skip lessons they are already familiar with. After they take a pre-assessment in the beginning of the course, they receive feedback on his or her performance on the test and the course allows them to skip the parts on which they demonstrated mastery in the assessment.

The learner usually clicks the left-hand and right-hand arrows on the upper-right corner of the screen to move along the lesson, but can also control the sequence of the instruction using the course map. The course map allows the learner to navigate to any part of the course that he or she wants to repeat or jump to by clicking a lesson or activity title listed on the course map at any point in the course. The learner also has control over the pace of learning in that he/she is able to pause and return to the course at any time, and the course allows the learner to start the instruction where he or she left off when returning to the course.

Additionally, the courses provide learners with access to learner support, though to differing extents depending on the context. For some learners, the course provides access to customer support 24 hours per day, seven days per week via phone, e-mail, or instant messaging, as suggested in the information provided in the e-learning provider's Web site and also from the results of the interviews in this study. For instance, some interview participants from corporate settings had access to learner support. Yet, the

interview participants who were in the university setting did not have access to such

support because the university did not provide that option at the time of this study. The

courses under investigation also provide learners with additional resources, including

course guides and tutorials on how to use the course management system. Additionally,

participants in the sample soft skills course have access to reference materials that

contain additional resources on the topics covered in the course. Such additional

resources are not available in the other two sample courses.

The sample courses also provide the learner with adaptivity to some extent. For

instance, the learner is allowed to choose to hear the instruction via audio instead of

reading it as text on the screen. Also the learner can customize display settings (e.g.,

background colors, font sizes, and interface themes) according to his or her preference.

Figure 4 shows the user preferences screen where the learner can customize a variety of

display settings.
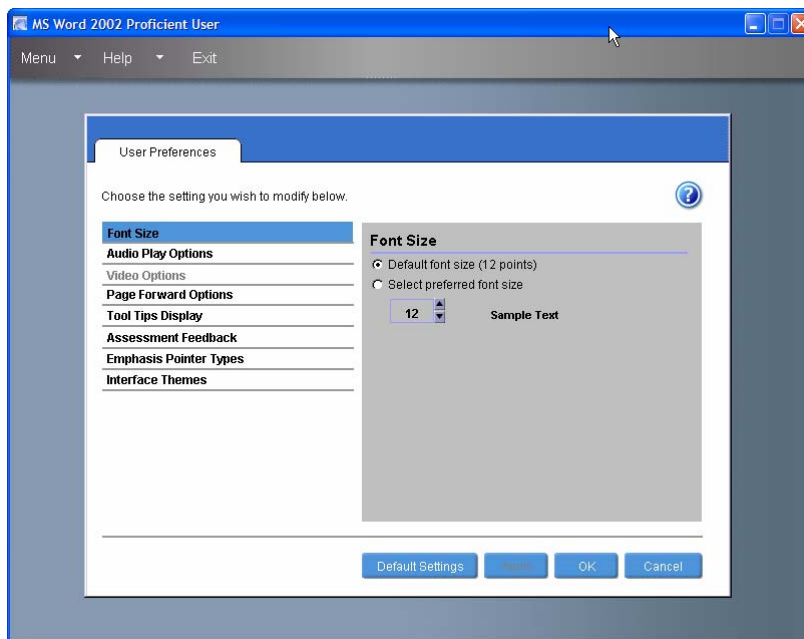
Figure 4. User preferences screen.

4.2 Summary of the Content Analysis

Findings from this content analysis indicated that the e-learning courses under investigation did not contain a large amount of text, ranging between 30 and 46 words per page. The learner was allowed to listen to the information given on each page of the course instead of or in addition to reading it on the screen. Graphics were used in almost every page throughout the sample courses, though there were fewer graphics in the computer programming course than in the other two courses. Furthermore, the graphics displayed on the sample e-learning courses were static ones, such as illustrations, photos, and screenshots; no dynamic images were included.

A variety of interactive features were used in those courses, yet they were used sparsely across the courses, ranging from 0.1 to 0.6 interactive features per page. The type of interactive features found in the sample e-learning courses included dragging and dropping items, typing in texts into a text field, animations, and simulations. In particular, those interactive features appeared mostly in practice items and were not used to present the information covered in the lesson. Such a low frequency of interactive features also indicated that text and static graphics were used as the main medium to present information in those e-learning courses.

In terms of learner control, the e-learning courses under study provided learners with control in their learning to the extent that they could control the pace and the sequence of instruction. Learners also were provided with options that they could set according to their preference in those courses. Additionally, some learners had access to learner support (e.g., an instructor or technical support staff) via phone, e-mail, or instant

messaging, although such support was not available to every learner, depending on the context in which the courses were offered to him or her.

The results of the content analysis showed that the overall course structure was similar across the three sample e-learning courses in that they shared the same instructional components: i.e., presentation, examples, and practice with feedback. Yet, there were also some differences across those e-learning courses in that the type of interactive features and the degree to which the interactive features were used differed across the courses. How such differences in course design influence learner motivation remains to be explored in the next phase of this study, i.e. the mixed-methods study. Also, there was some difference in the learner's context in that some learners had access to an instructor or technical support staff and others did not. It also remains to be explored in the next phase of the study whether such a difference in the availability of learner support influences the learner's motivation.

CHAPTER V.

LEARNER MOTIVATION IN SELF-DIRECTED E-LEARNING: RESULTS OF THE

MIXED-METHODS STUDY

5.1 Findings from the Qualitative Study

Several themes emerged about the learner's motivation for self-directed e-learning as a result of the analysis of qualitative interview data, which are described in the following section. Learners' motivations are investigated in terms of their motivation to start, persist in, and continue self-directed e-learning. Also, the factors that influence the learner's motivation during his or her self-directed e-learning are analyzed from the interview data.

5.1.1 Learners' Motivation to Start Self-Directed e-Learning

Nine of the participants in this interview study mentioned that they took a self-directed e-learning course to enhance their job skills or for personal development; it was not mandated by their job or coursework. Three of the participants took the e-learning course as part of class or work requirements; two of them took the courses as part of their formal job training, and the other participant took one to get credit for his class. None of the interviewees had to pay to take the course because it was offered them for free as a service by their organization.

Most of the participants in this interview study pointed out that the flexibility and convenience of self-directed e-learning were the primary reasons they chose an online training option. Participants noted that they were motivated take a self-directed e-learning course because it enabled them to learn at their convenience without time

constraints. For instance, a participant who was a full-time working professional

explained why she chose to take an e-learning course over a face-to-face class as follows:

> I've had occasion to use Excel in my job here at the art museum sometimes, and I've kind of taught myself how to use it, I taught myself how to use it, but I thought I'm sure there are things that I could do with it that I don't know because I don't have time, or there are easier ways to do things that I'm doing several steps, when really probably you could just do them in one step. So, I thought a course would be good and I don't have the time, to say, I don't feel as if I have the time to make a commitment to go to a class at a certain time for a certain number of hours, but this online course seemed to me, I could do it at my own speed when I had time, I could sit down and do it for a while and come and go as I have the time available.

Another participant, a full-time student, also referred to the flexibility of schedule

as the main reason he chose to take a self-directed e-learning course:

> The main reason was because they (traditional classroom courses) have specific dates and my schedule was just too crazy to be able to do it. And the thing that I like about the e-learning course is that you can stop and then start again anytime, so it really works. It's flexible with your schedule.

The flexibility and convenience of self-directed e-learning appear to provide the

opportunity for learning for adult learners who otherwise find it difficult to make a

commitment to a traditional face-to-face class due to their busy schedules. One

participant who was a full-time working professional and also a part-time graduate

student stated as follows:

> Working full time and going to school in the evenings, there just really wasn't time to take a face to face class. I would probably have preferred a face to face class if there was time available but because I couldn't fit it in the schedule and would have to wait until one came around and I needed to do it now, the online class worked out pretty well. I could do it on my own time schedule.

5.1.2 Learners' Motivation during Self-Directed e-Learning

Learners' Persistence in Self-Directed e-Learning

Participants' retention rates and time on task in self-directed e-learning courses were investigated as indicators of learner persistence (i.e., the motivation to persist in learning). The time that the participants spent taking the e-learning course (time on task) varied from 1 hour to 10 hours. Half of the participants (i.e., six interviewees) did not complete the e-learning course within 3-4 months of beginning the course. Among the six participants who did not complete their self-directed e-learning course, two of them were working professionals and four of them were students.

Participants pointed out several reasons for not completing their e-learning course. Three participants in this study indicated that they did not complete the course because it was too boring and therefore they did not want to stay in the course any more. Two other participants indicated that lack of time was the main reason that they did not complete the course. Additionally, technical problems were an issue for a participant; he did not complete the course because he failed to start the course due to the difficulty of navigation of the course management system.

Retention rates differed across subject areas. For example, zero percent of those who took computer programming courses completed the course, whereas 100 percent of those who took soft skill courses completed the course (see Table 5). The participants who took computer programming courses mentioned that they did not complete their course because the course was not motivating enough for them to stay in it. This finding suggests that the lack of motivational quality could be a major reason for the high attrition rate in those e-learning courses.

Table 5

Retention Rates of the Interview Participants across Course Topics

Course Topics	# of Participants	# of Drop-outs	Retention Rates
Computer programming	3	3	0%
Desktop applications	7	3	57%
Soft skills	2	0	100%
Total	12	6	50%

Learners' Motivational Change during Self-Directed e-Learning

Although the convenience and flexibility of self-directed e-learning was the biggest motivator for the participants in this study to take a self-directed e-learning course, some participants indicated that convenience and flexibility did not necessarily motivate them enough to persist in their learning. When asked about the change in their motivational level while they took the e-learning course, eight out of twelve participants indicated that their motivational level did not change. The other four participants stated that their motivation waned as they went through the course; they indicated that such a decline in motivation ultimately led to their dropping out of the course. Some participants described how their motivation decreased as they went through the course. For example, one participant stated:

> At first, I think that I'm really, really excited and I want to do this, and I get all into it, and then after when, I would say, half-way through, I get sort of not as motivated - maybe even a little bit bored with it to a certain extent. When I first started, the ones that I chose, some of them really didn't intrigue me like the Dreamweaver class, but when I first started out with like Oracle, I was really interested in it, but I don't know if it was the output of it or whatever, but the time I was done, I really didn't care whether I learned Oracle or not, and, therefore, I had never finished that segment.

Another participant explained a similar decline in motivation as he explained why he did not complete the course:

> I would have learned a lot more if had stuck with the program but since I didn't stay with it and I dropped out of the class, I didn't learn nearly as much as if I had gone through every step of the process that was presented. But, there was nothing really holding me to the process so I just decided not to do it. It's interesting my motivation I think initially was very high and then just went straight down, so I stopped. I don't know if that's common or not.

As illustrated in the participants' comments above, the participants' motivational level in the beginning appeared to be high, but there appeared to be some changes in their motivation as they went through the course, although the motivation stayed the same for some participants.

5.1.3 Motivational Influences during Self-Directed e-Learning

As described earlier, the findings of this study indicate that the decline in motivation was the main reason for some of the participants not to complete the e-learning course. This section describes factors that influenced the learner's motivation during self-directed e-learning. From the interview study, six themes have emerged regarding motivational influences during self-directed e-learning, which are described below.

1. Interactivity of the e-Learning Course (Learner-Computer Interaction)

When asked what motivated them to learn while they took a self-directed e-learning course, several participants stated that animations and simulations in the course were interactive and that these interactive features helped them engage in their learning. For instance, a graduate student who took an introductory course on a desktop application (Macromedia Dreamweaver) stated that:

The one thing I did like about Dreamweaver (course) is it was very interactive and it would let you move things within while it's doing it, but the other one that I had tried to take before wasn't like there. Oracle (course) was the one I took before, that, it was just you read and then you try and answer the questions about what you read. If it was just read to answer questions, I mean, my interest in that subject went down within an hour. I didn't want to do it anymore. If it was interactive like the one with Dreamweaver (course) where it said to click the button and, you know, you could see what it did, then I was more interested in that. But if it was read to answer questions, I'd get really sleepy and bored.

Several participants also noted that interactivity was important for them to keep motivated in their self-directed e-learning. For instance, one participant mentioned that interactivity was the key to her staying motivated to learn:

The convenience is nice, but that's not what keeps it. It makes you want to try it, but it's not what keeps you interested in it. It's got to have more interaction. It doesn't hold my interest as long as what I think it should, and I think if there was some more interactivity of a program, then it would really keep my interest more, and I would be more enthused about taking more courses.

As illustrated by this participant's comment, the lack of interactivity in the e-learning course made her lose interest in the topic and that was a major reason for her to drop out of the course. This was often the case among those who took courses on computer programming; two out of three participants who took courses in computer programming mentioned lack of interactivity in the course as the major reason for losing interest in the course.

2. Absence of Human Interaction in Self-Directed e-Learning Courses

As described earlier, there was no interaction with the instructor or peers during self-directed e-learning for the participants in this study. Most of the participants did not have access to an instructor except for the two participants who took the course in a corporate training setting, who did have access to an instructor. Yet, these two

participants did not contact the instructor during their e-learning because they did not feel the need to do so.

The impacts of the absence of human interaction on the learner's motivation to persist in self-directed e-learning appear to be different across those who took the course in different settings (i.e., formal education settings vs. corporate training settings). Most of the students (4 out of 6) who participated in this study expressed their belief that human interaction was important for their learning and noted that the lack of human interaction in self-directed e-learning could have been a factor for the decline in their motivation to complete the course. For example, one graduate student explained that the absence of human interaction in the e-learning course was a major reason for him to decide not to complete the course:

> What made me not complete is that I had nobody to interact with and although I am a visual learner I enjoy interacting with other students because I learn from their experiences and so that was a negative for me and made me not want to finish the course. … I enjoy interaction. If there was interaction with other students taking the class, that would have been very helpful. Interaction with an instructor at some point whether it was more of a consultation, maybe something where, or some kind of interaction at any point that was possible with a person to ask questions about things that would have been very helpful. Because some questions that I might have had I couldn't find answers to because the course allowed for me to go at my own pace but didn't allow for me to ask my own questions about certain things which would really help clarify. That would have really been helpful.

In contrast, five out of six working adults who participated in this study responded that human interaction was not important for their learning in the self-directed e-learning environment, and indicated that the lack of human interaction had little impact on their motivation, as noted in the following comment by a participant who was a full-time working professional:

I guess I'm pretty motivated myself, so that (the absence of an instructor in the e-learning course) wasn't really a factor. I've taken online classes before with instructors, but doing relatively minimal work, and, you know, for me, I was doing that for a pretty specific purpose, you know, to figure out how to do a certain skill or skills. So, you know, I didn't see that being a problem. It's also nice to be able to just pace yourself, and if you have to get distracted, you can go back and pick it up from where you left off.

Results of the study indicate that one reason for such differences between adult students and working adults in the degree of impact of the absence of human interaction on their learning is that the learners in the workplace setting tend to prefer an independent learning style more than do those who are in the formal education setting. Three out of six working adults interviewed mentioned that they would prefer to learn in a self-directed e-learning format over an instructor-led one because of their preference for the flexibility of self-directed e-learning. For instance, a working adult stated that he would prefer self-directed e-learning over instructor-led classroom instruction because it gave him more flexibility in his schedule:

It would depend on the time flexibility, the ability to do it at any time was probably more important in this particular case than having an instructor. If I could do the same thing as a structured class and had the time I would probably prefer having an instructor but this being a fairly small class, a fairly small unit of material and having the flexibility whenever I wanted to was definitely a plus rather than having to schedule a particular time to be at a particular place or be online at a particular time or whatever.

Another reason that working professionals did not feel frustrated by the absence of interaction with an instructor during their self-directed e-learning seems to be that they tend to resort to using resources to find answers to their questions during their e-learning. Three working adults commented that they would get help from their peers who were more knowledgeable about the topic or look up information in books or research the Web

to get answers to their questions. This tendency is illustrated in the following comment

by a participant who was a full-time employee in a university:

> If it was something that related to like a software question, I would probably get into the Knowledge Base[4] and see if I could find out there. I also might ask other colleagues or friends if they would know. I suppose that somebody, you or whoever's setting the courses up, would know that information, if I had a question, I suppose.

In contrast, four out of six students interviewed mentioned that the presence of an

instructor would help their learning process (i.e., being able to ask questions). Most of

the students who participated in this interview study responded that they needed to

interact with an instructor to get answers to their questions. For example, a graduate

student who took a course on desktop application mentioned that:

> For instance, with in say a two-way ANOVA design or something like that and you're partitioning sums of squares a certain way you know I understand how to do it but I don't necessarily understand why I have to do it and a person could help explain to me why I had to do so perhaps structuring it that way where there is there is the, where there's the tools component and guiding me through how to do it and then a person kind of suggesting well this is why we're doing what we're doing. For me that would be really helpful and then since that wasn't there I was kind of left to my own devices to kind of try to understand why. Now verbally you could say why but perhaps for me it helps if somebody is telling me that.

3. Application and Integration of Content by the Learner

When asked what were the most interesting or engaging activities within the self-

directed e-learning course that they took, a majority of the participants indicated that they

were interested in activities that gave them hands-on experiences, such as animations and

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[4] The Knowledge Base is an online database of information on computer and Internet technologies offered

as a service by the university the participant was affiliated with.

simulations. One participant who took a course on desktop applications described his experience with animations in the course as follows:

> The thing I liked about the course was the fact that they had actual parts of the program in it. And I think, it looks like they set it up, obviously it wasn't actually the program, but they just had areas where if you were as close to you if you were actually doing the work in the program and I actually opened up the program and did stuff that way, too. So I could actually find out how it worked. I thought it was good. I thought it was good that they went through and used the actual program.

In addition to animations, simulations also seemed to be engaging and interesting to those who took self-directed e-learning courses. For example, when asked what the most interesting learning experience was in the self-directed e-learning course , a participant, who was a full-time working professional and took a course on consulting skills, described her experience with simulations in that course as follows:

> The thing I like about it the most is at the end of a series of topics it would put you into a simulation where you would be for instance with this particular course I was put in a situation as if I were actually coaching someone else like mentoring someone else and I had to, and it was set up in a discussion format and I had to choose the things that would be most appropriate to say given the current situation. So that was really helpful because it was real world type experience. They're very rich in where you can have a conversational simulation with someone and actually sort of an intelligent conversation where you are asked to respond appropriately and then it scores you on how well you did, which response was more appropriate. And I really, it's kind of like game playing. It was fun for me to try to guess what was a more appropriate response.

The participants' comments on their experiences with animations and simulations in the e-learning course suggest that learners can be more motivated to learn when they participate in authentic learning activities in which they apply and integrate what they learn into real-world situations. The following comments made by participants illustrate the importance of the application of knowledge for the learner. For instance, a full-time undergraduate student who took an e-learning course on a desktop application

(Macromedia Flash) mentioned that the activities that allowed him to apply what he learned were beneficial for his learning as follows:

> I definitely learn a lot more if I'm able to actually use the program like I'm going to be using it if I was going to have make a Flash presentation and so I think it would, I probably would retain more if it let you make a sample Flash presentation or even just told you what to do on an actual Flash thing to make, something more involved. Even say, I don't know, like moving a square across the screen or something like that. Just so you can get some of that down.

Also, a participant who was working full-time and took a course on a desktop application mentioned that she was satisfied with the course because she could apply what she learned to her work:

> I did learn a couple of things that I've used and one, I must of, not last Monday but a week before because somebody asked me a question and I told them that Flash could do this so what I did learn I was able to apply within a week after I learned it at my job so that was nice.

On the other hand, another participant, who was a full-time working professional and took a course on computer programming, found that he was not satisfied with the e-learning course because he felt that the application and integration of knowledge to real-world situations, as well as instructor feedback, were lacking in that course:

> … the disconnect that I saw is that you don't have the application, where you apply your knowledge, especially when it comes to programming language, it's very important to apply your knowledge. And that's why I find classroom work, such as college courses, are very beneficial, where you have the opportunity to apply that knowledge and have someone actually check your work, because you might think it's correct, but unless somebody else actually with the knowledge can check it, there's a disconnect there.

The instructional approaches that allow learners to apply and integrate what they learn are known to be effective for learning, and the findings of this interview study

indicate that such approaches are effective in motivating learners in self-directed e-learning courses as well.

4. Learner Control

Most of the participants in this interview study indicated that they felt positive about being able to control their learning in self-directed e-learning courses. For instance, one working professional who took a course in consulting skills and had also taken a few other e-learning courses mentioned that she would prefer to take a self-directed e-learning course over a classroom course because she could control her learning experience better in the self-directed e-learning environment:

> It (self-directed e-learning) was probably less boring (than traditional classroom instruction). Part of it is I can control my learning experience better. I get bored very easily in a classroom where maybe the discussion is or the content is either way above me or way below me and so I like to have training that's relevant to what I need and I really like the way that e-learning can do that.

In particular, some participants noted that being able to control the pace of their learning in a self-directed e-learning course was a key motivator for them to stay in the course. Since those participants were adult learners who usually had busy schedules with multiple responsibilities in their lives, they appreciated the fact that they could learn at their own pace in the self-directed e-learning environment. One participant who was a part-time student with a full-time job and took a course on desktop applications noted that:

> …and the fact that it's work at your own pace is nice, too. Because there are some online classes where they do want you to be on a schedule, to have things turned in if you're being graded and so forth, but with this online course, it's nice to just find the time, find a half hour here or there and go in and work on it, and not feel that pressure of I have to do this right away.

Most of the participants also preferred having control over the sequence of instruction. They found it motivating to take self-directed e-learning courses in which

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they could skip the parts with which they were already familiar, thereby allowing them to spend more time on the parts with which they were unfamiliar. Having control over the sequence of instruction was a main reason for some participants to prefer self-directed e-learning over classroom instruction. For instance, one participant who was a full-time working professional, stated:

> The one thing I guess I kind of preferred a difference between the two (face-to-face and online instruction) was that when we were covering sections that I was familiar with I was able to move through very quickly versus in a classroom I would had to sit through their lesson outlined for them to get through that. I was able to skip over the easier things and go to the harder parts I really wanted to spend time on. So that was probably another difference: the ability to move at your own pace where you can't do that in a classroom setting.

In contrast, some participants who took the course to get credit for completion found it unmotivating to have to go through every lesson in the course. For instance, a student who took an e-learning course on a desktop application program as a course assignment felt that he did not have control over his learning while he took the course:

> Right, because you have to go through every section and if you go through it too quick, it doesn't give you credit. If I didn't need the credit for it, I probably would have skipped some sections. But going through the whole thing, if you have to go through the whole thing, some parts are just like, I don't really need this.

The absence of learning support seemed to have some impacts on some learners' motivation to start self-directed e-learning. Although most of the participants indicated that they had not encountered any technical problems during their self-directed e-learning, one participant was not able to figure out where to go to start the course after he signed up for it due to the complex interface design of the course management system, as he explained as follows:

> What came around was I looked for them a couple of times to get on and I couldn't figure out how to get to the actual work. I signed up, I put my name in and I was registered and I saw the stuff but I wasn't able to find the step. I imagine it read out like this is what you should do and then you should do this on a computer and then you should do this. But I never found that. I don't know if I was clicking on the wrong thing. I don't think the user interface of the web site was that well like it was kind of hard to navigate. … Because had I got started and got into it a little more I know, I probably would have made it more of a priority, but since I never found it that hurt me.

He did not resort to any help to solve the problem and eventually dropped out of the course although his initial motivation to take the e-learning course was high as a way to enhance his job skills. Such a finding indicates that appropriate learner support is needed to help learners solve problems that they could encounter in the initial phase of self-directed e-learning, especially those caused by technical difficulties or interface design issues as a means to reducing non-starters – i.e., those who do not start the e-learning course after registering for it.

5. Psychological Influences in Self-Directed e-Learning

Most of the interview participants responded that they did not feel any nervousness when they took the self-directed e-learning course. A few themes have emerged regarding what contributed to such positive psychological influences in self-directed e-learning, which are described below.

Positive climate of the learning environment.

Several interview participants responded that they felt comfortable taking self-directed e-learning course because they could learn in the comfort of their home. One undergraduate student commented as follows:

> I like the fact that I could go at my own pace and obviously, I think it was like the comfort of being able to do it at home. If you're, you know, if you want to eat or just go do something else for a little bit and then come back to it. It takes away any kind of stress that you get from a classroom setting.

Such a positive climate in the learning environment could have positive psychological influences on the learner's motivation for self-directed e-learning.

No pressure for deadlines, grades, etc.

Several participants also mentioned that taking a self-directed e-learning course did not make them anxious or nervous because there was no pressure for deadlines or grades in this type of course, as illustrated by the following comments from the participants.

> Because there are some online classes where they do want you to be on a schedule, to have things turned in if you're being graded and so forth, but with the e-learning course, it's nice to just find the time, find a half hour here or there and go in and work on it, and not feel that pressure of I have to do this right away.

> … because it's a disconnected state, you don't have to worry about somebody else watching over your shoulder. So, there's no nervousness there. I also feel that being the fact that you're not trying to get a certification, you're not trying to get a degree, there's less pressure on you.

Prior experience with online learning.

Some of the interview participants who had experience with online learning (e.g., self-directed e-learning courses or online college courses) before they took the self-directed e-learning course responded that their prior experience with online learning helped them feel less nervous about learning through the Web in the self-directed e-learning course. One full-time working professional who had taken online college courses before she took the self-directed e-learning course commented that:

> When I was in college, I had taken a few online courses, so I think I've had a little bit of experience with this medium, I guess, of learning, and at the time, it was an online course, but half of the time, we were face-to-face with the instructor in the classes and the other half, we were taking the course online, but in a synchronous time, so we could communicate, kind of like a chat room thing. But I haven't ever taken a course that was just like a tutorial, like a lesson. So this will be a new experience, but I didn't feel nervous about it at all.

6. Lack of External Motivators in Self-Directed e-Learning

Some participants in this study pointed out that presence of external motivators would help them become more motivated to complete their self-directed e-learning course. These participants mentioned that they easily forgot to go back to the e-learning course or put off doing so due to their busy work schedules. This seemed due, in part, to the lack of pressure for the learner to complete the course. For instance, one participant who was working full-time and took a course on computer programming for her personal development mentioned:

> That's a good one, 'cause I meant to do it today and I haven't had time. I think that's what worries me. Because it's free and because I have to schedule myself it's real easy to put it off in lieu of getting other work done but I know I want to do it so eventually I'll do it.

A graduate student who took a course on a desktop application mentioned the absence of external motivators was one of the reasons that he decided not to complete the course:

> Because there was no commitment of having to be in class it was really self paced and so it was easy for me to rationalize not going or not doing it. So, in the beginning I was very motivated to study and learn but then after spending hours doing it I thought there's no feedback and there's nothing kind of continuing to drive me to do what I was doing and it was easy for me to kind of say well I'll learn this later or something you know kind of rationalize, I suppose.

The findings of the study indicate that the absence of external motivators in the self-directed e-learning environment may have both positive and negative influences on the learner's motivation; thus, it may help the learner to stay in the course by not having them feel pressure for completing the course but learners could be more motivated to complete the course when there are external motivators for doing so.

5.1.4 Learners' Motivation to Continue Self-Directed e-Learning

Most of the interview participants responded that they would continue to take self-directed e-learning courses in the future. Such a response was consistent across the participants who did or did not complete the course. Furthermore, three out of four participants who found that their learning experience with the self-directed e-learning course was not motivating responded that they would take another e-learning course. Only one participant who responded that he would rather look up information books to learn in the future.

The major reason for those participants to continue taking self-directed e-learning courses was its flexibility. One participant who was working full-time noted that she planned to take an advanced level of the course which she had just completed and also mentioned that she recommended self-directed e-learning to her colleagues because of its flexibility:

> I actually have told, there's a fellow who works here in the museum who kind of oversees the computers in the museum and he's been trying to encourage staff members here who are very different levels of computer literacy to go, some people to go and take some courses, in the regular kind of classroom setting, and I told him about this thing online because I think this is a good solution, potentially a good solution for people like me who don't feel as if they have the time or don't want to make the commitment to be over in this classroom from noon to 3:00 on Tuesday and a Thursday, getting the information, you're learning, but you can do it when you can do it. And that, I think, is a tremendous advantage.

Results of this interview study show that the motivational aspect of one's learning experience influenced his or her motivation to continue self-directed e-learning. One participant who said he would refer to books rather than to take another e-learning course to learn a server technology (.NET) explained why he decided not to continue taking self-directed e-learning courses as follows:

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At first, I was very motivated. Half-way through, I started going, you know, this is really hard to use and I don't seem to be learning, and then I got three-quarters of the way through, and I said, you know, I have the knowledge I want, I'm finished. And I tried a couple other applications; one was 2000 server administration. And that one I felt to be exactly like .NET and I said, well, you know, after doing one and getting three-quarters of the way through, seeing that 2000 server was just like .NET, I said, you know, I don't want to do this again. So I said, time out; this is it.

Thus, the finding indicates that one's overall satisfaction with his or her learning experience had a key impact on his or her motivation to continue self-directed e-learning.

5.2 Findings from the Quantitative Study

Various descriptive and inferential statistics were performed on the quantitative data gathered from the survey study. This section presents the results of the analysis of the quantitative data.

5.2.1 Participants' Demographics and Backgrounds in e-Learning

Of 368 respondents to this survey, e-learning courses were offered in a formal education setting (e.g., colleges and universities) to 40 percent of the respondents and in a corporate training setting (i.e., business, non-profit, government or military organizations) to 60 percent of the respondents. In terms of the respondents' vocations, 43 percent took the e-learning course as college students and 52 percent took the course as working professionals.[5] The working professionals who participated in this survey belonged to organizations of various types: 45 percent belonged to a business organization, 39 percent

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[5] Respondents were asked to select only one profession in which they took the self-directed e-learning course. However, some of the respondents could have belonged to more than one profession; for example, an adult who held a full-time job and also was a part-time student in a university.

belonged to a college or university, and 13 percent belonged to not-for-profit or government organizations. Among 158 college students who participated in this survey, 30 percent ($n = 47$) of them were undergraduate students and 70 percent ($n = 111$) of them were graduate students.

Gender was equally distributed among the respondents to this survey: 46 percent were female and 54 percent were male. Results of the chi-square test showed that there was no significant difference in the gender ratio between the respondents who were in formal education settings and those in corporate training settings [χ^2 (1, 366) = .000, p = .543]. In terms of age, 18.2 percent of the respondents were 24 years old or younger, 43.5 percent were between 25 and 34 years of age, 21.7 percent were between 35 and 44 years of age, and 16.6 percent were 45 years old or more. Results of the chi-square test showed that the respondents who took an e-learning course in corporate training settings were significantly older than those who took such a course in formal education settings [χ^2 (4, 363) = 25.777, $p < .01$].

Most of the survey respondents had moderate to high levels of experience in using computer and Internet technologies. Over 70 percent of respondents said they were using the Internet more than 20 hours per week, and 87 percent of them reported that they were using at least 3-5 software programs on a regular basis. These two items regarding the respondents' computer competency had a significant positive correlation with each other ($r = .340, p < .01$). Respondents to this survey study took self-directed e-learning courses on various topics; 48 percent responded that they took a self-directed e-learning course on desktop applications, 30 percent took a course on computer programming, and 22 percent took a course on soft skills. The time that respondents spent taking a self-

directed e-learning course also varied; 10 percent of those surveyed responded that they spent less than an hour taking the e-learning course, 62 percent responded that they spent 1-6 hours in the course, and 19 percent responded that they spent 7 hours or more in the course.

In terms of the respondents' prior experience with online learning, 30 percent responded that they had had no prior online learning experience and the other 70 percent responded that they had taken 1-7 or more online courses, including college online courses and self-directed e-learning courses. Results of the chi-square test revealed that there was a significant difference in the amount of prior experience with online learning between those in formal education settings and corporate training settings [χ^2 (1, 366) = 12.770, p < .05]; that is, the respondents in corporate training settings had more experience with online learning than did those in formal education settings.

When asked about the frequency of their interaction with an instructor or technical support staff, a majority of those surveyed responded that they rarely had such interactions while they took the e-learning course. In more detail, 31 percent of the respondents indicated that they never had such interactions and another 60 percent of those surveyed responded that they rarely or occasionally interacted with an instructor or technical support staff. The results of chi-square revealed that there was no significant difference in the frequency of such interaction in the self-directed e-learning course between those in formal education and corporate training settings [χ^2 (4, 363) = 4.840, p = .304].

5.2.2 Motivations for Self-Directed e-Learning

1. Learners' Motivations for Starting Self-Directed e-Learning

The survey results indicate that a majority of the respondents began their self-directed e-learning for personal or professional development purposes. When asked what their motivations were for taking a self-directed e-learning course, 47 percent of the respondents said that they took the course to enhance their job skills, 33 percent took it for personal development, 12.5 percent took it to complete mandatory training or class assignments, and 5 percent took the course to receive a certificate (see Table 6).

Table 6

Respondents' Motivations for Starting Self-Directed e-Learning

	Frequency	Percent	Cumulative Percent
1. To enhance my job skills	173	47.0	47.0
2. For personal development	122	33.2	80.2
3. To complete mandatory training or class assignments	46	12.5	92.7
4. To receive a certificate	20	5.4	98.1
5. Other	7	1.9	100.0
Total	368	100.0	

Of interest is that 34 percent of those who were in formal education settings responded that they took e-learning courses for personal development, whereas 56 percent of the respondents in corporate training settings answered that they took a course to enhance their job skills (see Table 7). Results of the chi-square test showed that there

was a significant difference in the learner's motivation to start self-directed e-learning among the respondents in different settings [χ^2 (4, 363) = 21.506, $p < .01$].

Table 7

A Comparison of Motivation for Starting Self-Directed e-Learning across Learners in Different Settings (Formal Education vs. Corporate Training Settings)

Motivation for starting e-learning	Respondents' Educational Setting		
	Formal Education	Corporate Training	Total
For personal development	52	69	121
	(33.6%)	(30.7%)	(30.7%)
To enhance my job skills	48	125	173
	(33.8%)	(55.6%)	(47.1%)
To receive a certificate	11	9	20
	(7.7%)	(4.0%)	(5.4%)
To complete mandatory training or class assignment	28	18	46
	(19.7%)	(8.0%)	(12.5%)
Other	3	4	7
	(2.1%)	(1.8%)	(1.9%)
Total	142	225	367
	(100.0%)	(100.0%)	(100.0%)

In a multiple-response question that asked about the reasons for choosing an online training option over other instructional formats, e.g., classroom instruction, 49 percent of the respondents said that they chose an e-learning course because of the

convenience and flexibility of online learning (i.e., learning anytime anywhere). Also, 25

percent of those surveyed responded that they chose an online training option because

classroom training was not available to them or did not fit their schedule (see Table 8).

Table 8

Respondents' Reasons for Choosing an Online Training Option (N = 364)

Reasons	Frequency	Percent
1. Convenience of online learning	214	27.5
2. Flexibility of self-directed learning	167	21.4
3. Classroom training did not fit my schedule	130	16.7
4. Classroom training was not available	65	8.3
5. Cost less than taking classroom instruction	60	7.7
6. Fit better with my learning style	58	7.4
7. Interested in using the computer technology in learning	51	6.5
8. Fit better with my personality	23	2.9
9. Other	11	1.4
Total	779	100.0

Note. This question was a multiple-response item, in which respondents could choose more than one

response from a list of nine response options.

2. Learners' Persistence in Self-Directed e-Learning

85 percent of those surveyed responded that they intended to complete the e-

learning course when they began taking the course. However, 65.9 percent of the

respondents actually completed the course, whereas 15.5 percent of them answered that they did not complete the course; another 13.4 percent answered that it was still in progress. When asked why they did not completed the course, 35 percent of the respondents (*n* = 28) answered that it was too boring or the content was not relevant, and 24 percent (*n* = 19) responded that they were to busy to finish the course (see Table 9).

Table 9

Respondents' Reasons for Dropping out of the e-Learning Course

| | | | Cumulative |
Reasons	Frequency	Percent	Percent
1. I was too busy.	19	24.1	24.1
2. It was too boring.	14	17.7	41.8
3. The content was not relevant to me.	14	17.7	59.5
4. There were technical difficulties.	9	11.4	70.9
5. I got all the information that I need to get from the course.	9	11.4	82.3
6. It was too easy or difficult for me.	7	8.9	91.2
7. Other	7	8.9	100.0
Total	79	100.0	

The results of ANOVA revealed that there was significant difference in the completion rate across course topics [F (2, 365) = 8.447, $p < .01$], as shown in Table 10. The post-hoc comparison analysis using the Tukey HSD test revealed that the completion rate among learners who took courses in soft skills was higher than that among learners

who took courses in desktop applications or computer programming, at the .05

significance level. Yet, there was no significant difference in the learner's satisfaction

level with the course across different course topics [F (2, 365) = 1.264, p = .284].

Table 10

ANOVA for Course Completion Rates among Different Course Topics

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	13.429	2	6.714	8.447	.000 **
Within Groups	290.125	365	.795		
Total	303.554	367			

** $p < .01$.

The course completion rate among respondents in formal education settings was

59.2 percent, whereas the completion rate among those in corporate training settings was

70.2 percent (see Table 11). A chi-square test was performed to investigate the

difference in the attrition rate between those in formal education settings and corporate

training settings. Results of the chi-square test showed that the course completion rate

among those in corporate training settings was significantly higher than that of those in

formal education settings [χ^2 (4, 363) = 21.132, $p < .01$)].

Table 11

A Cross-Tabulation of Course Completion Ratios between Learners in Different

Educational Settings

Educational Settings	Did you actually finish all the lessons in the course?				
	Yes	No	Still in Progress	Don't Know	Total
Formal Education					
Count	84	34	12	12	142
% within Setting	59.2%	23.9%	8.5%	8.5%	100.0%
Corporate Training					
Count	158	23	37	7	225
% within Setting	70.2%	10.2%	16.4%	3.1%	100.0%
Total					
Count	242	57	49	19	367
% within Setting	65.9%	15.5%	13.4%	5.2%	100.0%

3. Factors Influencing Learner Motivation in Self-Directed e-Learning

A factor analysis of the thirty-three Likert-scale items on motivational influences in self-directed e-learning was performed using image factoring extraction method with varimax rotation. The Likert-scale values of the items that had negative loadings on a factor were reversed when factor scores were computed. This factor analysis resulted in seven factors with initial eigenvalues over 1. A reliability analysis (i.e., Cronbach's α) was conducted on each factor to test for internal consistency. Results of the reliability

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analyses revealed that only three factors had acceptable reliability levels, which ranged

from .651 to .843. Therefore, it was concluded that only these three factors were

acceptable to explain the motivational influences in self-directed e-learning. Table 12

presents the results of factor analysis and reliability analysis on each factor.

Table 12

Factor Analysis and Reliability Analysis Results

Factor	Items	Reliability coefficient
1. E-learning is not for me.	16. I did NOT have enough technical skills to be successful in e-learning.*	$\alpha = .843$ $(N = 368)$
	19. Some learning tasks in the course were too challenging for me.*	
	43. I was overwhelmed with the amount of information presented in this course.*	
	28. I experienced too many disruptions to get through the course.*	
	31. I would prefer to use other medium for a self-paced course.*	
	23. Technical difficulties that I encountered while I took this course frustrated me.*	
	26. I felt anxious or frustrated when I had to take tests or quizzes in this course.*	
	32. This course format was not suited for my	

	learning style.*	
	22. I often forgot to go back to the course when I took this e-learning course.*	
2. E-learning is right for me.	35. This course content was useful to me.	$\alpha = .822$
	36. Multimedia presentations in this course stimulated my interest.	$(N = 368)$
	34. Taking a self-directed e-learning course was worthwhile.	
	44. The course content was relevant to my interests.	
	30. The course simulated real-world situations.	
	17. The difficulty level of the course content was just right for me.	
	46. It was important for me to complete this course.	
	45. My institution was supportive of my e-learning.	
	29. Hands-on activities in this course helped me engaged in learning.	
	40. I received enough feedback on my performance in this course.	
	42. I was interested in learning through technology as a way to enhance my technical skills.	
	41. The course Web site was easy to navigate.	

3. I don't want to be all by myself.	33. I wanted to get answers to my questions from an instructor.*	α = .651
		(N = 368)
	38. I would prefer to interact with peers rather than to learn on my own in an online course.*	
	39. I needed to be under a deadline to complete this course.*	

*These items were negatively loaded on a factor and were reverse-coded when computing scale scores and reliability coefficients for each factor.

Descriptive statistics were performed on the factors to investigate the mean scores of these factors. The mean scores of these three factors ranged from 3.02 to 3.73 on a 5-point scale (1 = "strongly disagree" and 5 = "strongly agree"), which suggests that the respondents' had moderately strong belief that e-learning was for them, or not for them, or they did not want to do it all by themselves (see Table 13).

Table 13

Descriptive Statistics for the Motivational Factors in Self-Directed e-Learning

Factors *	N	Minimum	Maximum	M	SD
Factor 1	368	1.67	5.00	3.4580	.66509
Factor 2	368	2.00	5.00	3.7310	.46197
Factor 3	368	1.00	5.00	3.0163	.80438

* Factor 1 = "E-learning is not for me."

Factor 2 = "E-learning is right for me."

Factor 3 = "I don't want to be all by myself."

An ANOVA was conducted to investigate if there were significant differences in the learner's motivational attributes between the learners who completed and did not complete the e-learning course. The results showed that there were significant differences in the level perceptions on the three motivational factors between those who completed the e-learning course and who did not (see Table 14). Post-hoc comparison tests revealed that those who did not complete the course had a higher level of motivational attribute for "e-learning is not for me" than those who completed the course or were still in progress [F (3, 364) = 7.769, p < .01]. Additionally, the learners who completed the course had a higher level of motivational attribute toward "e-learning is right for me" [F (3, 364) = 17.201, p < .01]. Results of ANOVA also revealed that learners who did not complete the course were more likely to think that "I don't want to be all by myself" than those who did complete the course [F (3, 364) = 2.948, p < .05].

Table 14

ANOVA between Learners' Motivational Attributions and Course Completion Rates

Motivational Factor [§]	Sum of Squares	Df	Mean Square	F	Sig.
Factor 1					
Between Groups	9.769	3	3.256	7.769	.000**
Within Groups	152.570	364	.419		
Total	162.339	367			
Factor 2					
Between Groups	9.725	3	3.242	17.201	.000**
Within Groups	68.600	364	.188		
Total	78.325	367			
Factor 3					
Between Groups	5.632	3	1.877	2.948	.033*
Within Groups	231.825	364	.637		
Total	237.458	367			

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

[§] Factor 1 = "E-learning is not for me."

Factor 2 = "E-learning is right for me."

Factor 3 = "I don't want to be all by myself."

Additionally, an ANOVA was conducted to find out if there were significant

differences in the motivational attributes among learners of different vocational statuses

(i.e., college students versus working professionals). The results revealed that the mean

score of the third motivational factor ("I don't want to be all by myself.") of students was significantly higher than that of working professionals [F (2, 365) = 6.592, $p < .01$] (see Table 14). The results of ANOVA also revealed that there was no significant difference in the mean score between students and working professionals for the other two motivational factors, where F (2, 365) = .956, $p = .385$ for the factor "e-learning is right for me," and F (2, 365) = .483, $p = .617$ for the factor "e-learning is not for me."

An ANOVA was performed to find out if there were significant differences in the motivational attributes among learners in different educational settings. The results of ANOVA showed that there were no significant differences in the mean scores of the three motivational factors between learners in formal education settings and those in corporate training settings, where F (1, 366) = 2.344 ($p = .127$), F (1, 366) = 1.687 ($p = .195$), and F (1, 366) = 3.224, ($p = .073$), for the factors 1, 2, and 3 respectively.

4. Learners' Motivational Change during Self-Directed e-Learning

The respondents' self-reported overall initial motivational level was high ($M = 4.95$, $SD = 1.272$, where 1 = "very low" and 7 = "very high") and their motivational level after they went through some lessons in the course was also high ($M = 4.95$, $SD = 1.333$, where 1 = "very low" and 7 = "very high"), as shown in Figure 5. When asked how the respondents' motivational levels changed as they went through the self-directed e-learning course, they responded that their motivational levels remained the same ($M = 3.01$ and $SD = .976$, where 1 = "decreased significantly" and 5 = "increased significantly"). Results of ANOVA showed that there were no significant differences in the level of the learner's motivational change between groups in different educational settings [F (2, 365) = .375, $p = .688$].
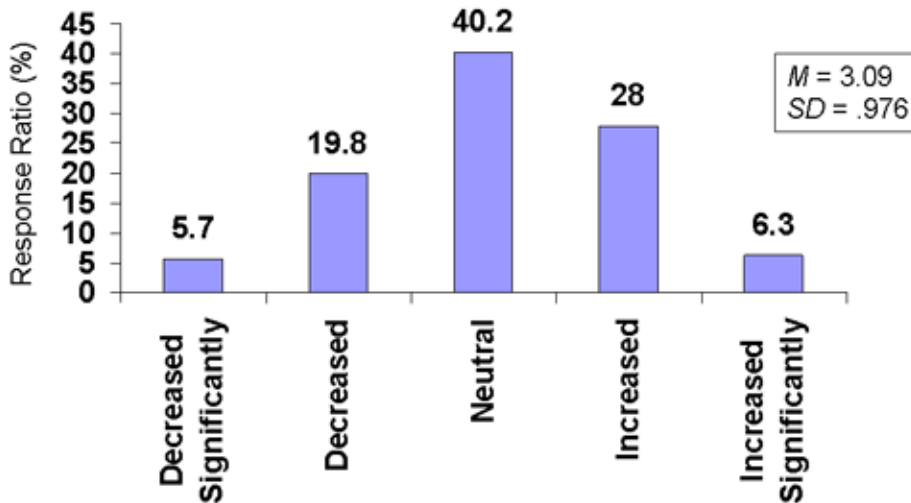
Figure 5. Results of descriptive analysis of learner's motivational change.

Similarly, when the respondents were asked to rate their motivational levels

before and after they took the e-learning course on a seven-point scale (1= "very low"

and 7 = "very high"), the mean difference of their motivational levels between before and

after they took the course was .01 (SD = 1.367), where -6 indicated that their motivation

level decreased significantly, 0 indicated that their motivational level did not change, and

+6 indicated that their motivational level increased significantly. In more detail, 40

percent of the respondents reported that their motivational levels stayed the same while

they went through the self-directed e-learning course, whereas 25 percent reported that

their motivational levels decreased and 35 percent responded that their motivational

levels increased during their self-directed e-learning.

The results of correlation analysis showed that the learner's motivational change –

i.e. an increase or decrease in the learner's motivation level during self-directed e-

learning – had a significant positive correlation with his or her satisfaction with the e-

learning course (r = .327. p < .01). The learner's motivational change also had a

significant positive correlation with the frequency of his or her interaction with an

instructor or technical support staff during the self-directed e-learning ($r = .244$, $p < .01$). Additionally, the learner's motivational change had a significant negative correlation with his or her age ($r = -.107$, $p < .05$), as seen in Table 15. Among the three motivational factors, only the first motivational factor, "e-learning is just for me" was significantly positively correlated with the learner's motivational change ($r = .467$, $p < .01$). The other two motivational factors "e-learning is not for me" and "I don't want to be all by myself" were not significantly correlated with the learner's motivational change, where the correlation coefficients were -.031 ($p = .548$) and -.020 ($p = .706$) respectively.

Table 15

Variables that are Significantly Correlated with the Learner's Motivational Change during Self-Directed e-Learning

Variable	Correlation Coefficient (r)	Coefficient of Determination (r^2)
"E-learning is right for me."	.467**	.218
Learner satisfaction	.327**	.107
Interaction with an instructor or technical support staff	.244**	.059
Learner's age	-.107*	.011

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

5.2.3 Factors Associated with the Learner's Motivational Change

A multiple regression analysis was performed to identify the factors that were associated with learners' motivational change during self-directed e-learning. A multivariate analysis was performed to investigate whether such variables age, gender, or

e-learning background, would explain the learner's motivational change better than when only taking the three motivational factors into account. The dependent variable for this multiple regression analysis was the learner's motivational change during self-directed e-learning. In this item, respondents were asked to rate the level of change in their motivation while they took a self-directed e-learning course on a five-point scale, where 1 = "decreased significantly" and 5 = "increased significantly" (see item #53 in Appendix D).

Thirteen independent variables were entered for the stepwise regression analysis, which consisted of demographic variables (age, gender, respondents' vocational status, and the setting in which they took the e-learning course), the respondent's backgrounds in e-learning (computer competency, course topics, prior experience with e-learning, time spent in taking the e-learning course, and the amount of interaction with an instructor or technical support staff in the self-directed e-learning course), and the three motivational factors identified from the factor analysis. Dummy coding was conducted on categorical variables to create dummy-coded vectors when the variables were entered in the regression equation.

Table 16 summarizes the results of the regression analysis. The results revealed that five out of thirteen variables entered for the stepwise multiple regression analysis significantly contributed to predicting the learner's motivational change during self-directed e-learning. Those five predictors accounted for 30.2 percent of the variance in the learner's motivational change (R^2 = .302, adjusted R^2 = .293). Table 14 summarizes the results of stepwise regression analysis, including regression coefficients, intercept, R^2 and adjusted R^2.

Table 16

A Summary of Stepwise Multiple Regression Analysis of Variables for Predicting the

Learner's Motivational Change during Self-Directed e-Learning

	Unstandardized Coefficients		Standardized Coefficients			Adjusted	
Variables [§]	B	SE B	β	Intercept	R^2	R^2	R
1	.988	.098	.467	-.596	.218	.216	.467 **
2	.147	.044	.166	-.592	.241	.236	.491 **
3	.162	.044	.171	-.667	.268	.262	.518 **
4	-.136	.041	-.146	-.442	.289	.282	.538 **
5	.232	.090	.116	-.488	.302	.293	.550 **

Note. Formal education setting was the reference category for educational setting dummy variable, where the other category in this variable was corporate training setting.

** $p < .01$.

§ 1 = Motivational factor: "e-learning is right for me"

 2 = Learner satisfaction

 3 = Frequency of interaction with instructor or technical support staff

 4 = Age

 5 = Educational setting.

Results of this multiple regression analysis indicated that the first predictor (motivational factor: "e-learning is right for me") best explained the variability in the dependent variable, accounting for 22 percent of the variance (R^2 = .218, adjusted R^2 = .216). The second predictor (learner satisfaction) added 2.3 percent to the prediction [R = .491, $F(2, 363)$ = 57.527, $p < .01$], and 2.8 percent of the variance was increased by

adding the third predictor (the frequency of interaction with an instructor or technical support staff) to the equation [$R = .518$, $F(3, 362) = 44.258$, $p < .01$]. The fourth predictor (age) added 2.1 percent to predicting the variance [$R = .538$, $F(4, 361) = 36.760$, $p < .01$] and the fifth predictor (educational setting) increased the prediction by 1.3 percent [$R = .550$, $F(5, 360) = 31.193$, $p < .01$].

The standardized regression coefficients (β) presented in Table 14 shows that the fourth predictor (age) has a negative coefficient value, whereas the other four predictors had positive coefficients values, indicating a negative linear regression between the learner's age and his or her motivational change. In addition, the standardized coefficient for the fifth predictor (educational setting) indicates that people in corporate training settings are more likely to increase in their motivational level as they go through e-learning courses than those in formal education settings are.

5.2.4 Learners' Motivation to Continue Self-Directed e-Learning

Sixty-two percent of the participants responded that they would choose to take another self-directed e-learning course in the future even if other training options were available, such as classroom instruction or instructor-led online courses. Eleven percent of those surveyed responded that they would not choose the self-directed e-learning option in the future. Similarly, the respondents answered that it was somewhat likely that they would take another self-directed e-learning course in the future ($M = 5.1$, $SD = 1.452$, where 1 = "very unlikely and 7 = "very likely"). For those who answered that they would continue self-directed e-learning in the future, 79 percent pointed out the convenience and flexibility of self-directed e-learning as the main reason, and 9.8 percent

pointed out the cost-effectiveness of self-directed e-learning as a major reason (see Table 17).

Table 17

Respondents' Reasons for Continuing Self-Directed e-Learning

Reasons	Frequency	Percent	Cumulative Percent
1. I can learn anytime and anywhere.	123	50.4	50.4
2. I can control the pace of my learning.	70	28.7	79.1
3. It costs less than classroom instruction.	24	9.8	88.9
4. The design of the course has drawn my interest in the topic.	10	4.1	93.0
5. Use of technology for learning	10	4.1	97.1
6. Other	4	1.6	98.7
7. Lack of other training options	3	1.2	100.0
Total	244	100.0	

When asked about why they would not continue taking self-directed e-learning courses in the future, six percent ($n = 22$) of respondents pointed out boredom as the reason. Three percent ($n = 11$) of respondents explained that they would prefer human interactions in face-to-face classes. Another three percent responded that it took more time for them to take a self-directed e-learning course than it did to take a face-to-face course. Additionally, 2.7 percent ($n = 10$) of those surveyed responded that they felt self-directed e-learning was not as effective as face-to-face classroom instruction.

Some inferential statistics were conducted to investigate differences in the learner's motivation to continue self-directed e-learning among learners with different vocational status and in different educational settings. The result of a chi-square test revealed that there was no significant difference in the learner's intention to continue self-directed e-learning among learners in different educational settings [χ^2 (4, 360) = 4.805, $p = .308$]. Additionally, the result of ANOVA showed that there was a significant difference in the learner's intention to continue self-directed e-learning between learners in different vocational statuses. Thus, the result revealed that working professionals were more likely to intend to continue self-directed e-learning in the future than students in formal education settings were [F (2, 365) = 3.540, $p < .05$].

Results of correlation analysis showed that the learner's intention to continue self-directed e-learning was significantly positively correlated with the learner's overall satisfaction with the course ($r = .382$, $p < .01$), the level of his or her prior experience with online learning ($r = .223$, $p < .01$), and with the amount of time that the learner spent in the course ($r = .105$, $p < .05$), as seen in Table 18. The results of the correlation analysis also revealed that the learners' intention to continue self-directed e-learning was significantly correlated with all three motivational factors. The learners' intention to continue self-directed e-learning was positively correlated with one factor, "e-learning is right for me" ($r = .579$, $p < .01$) and was negatively correlated with two factors, "e-learning is not for me" ($r = -.255$, $p < .01$) and "I don't want to be all by myself" ($r = -.204$, $p < .01$).

Table 18

Variables that are Significantly Correlated with the Learner's Intention to Continue Self-Directed e-Learning in the Future

Variable	Correlation Coefficient (r)	Coefficient of Determination (r^2)
"E-learning is right for me."	.579 **	.335
Learner satisfaction	.382 **	.149
"E-learning is not for me."	-.255 **	.065
Prior experience with online learning	.223 **	.050
"I don't want to be all by myself."	-.204 **	.042
Amount of time that the learner spent in the course	.105 *	.011

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

5.2.5 Learner's Overall Satisfaction with the e-Learning Course

The respondents indicated that they were satisfied with their overall learning experience in the e-learning course ($M = 3.57$, $SD = 1.1$, where 1 = "very dissatisfied" and 5 = "very satisfied"). A chi-square test was conducted to find out if there was a difference in the satisfaction level between learners in different educational settings. The results of the analysis revealed that there was no significant difference in the learner's satisfaction with the e-learning course between groups in different educational settings [$\chi^2 (4, 363) = 2.560$, $p = .634$]. Additionally, a correlation analysis was conducted to

investigate the relationship between the motivational factors and learner satisfaction. The

result of the correlation analysis revealed that all three motivational factors were

significantly correlated with the learner's overall satisfaction with the e-learning course

(see Table 19).

Table 19

The Relationship between the Motivational Factors in Self-Directed e-Learning and the

Learner's Overall Satisfaction with the Course

Motivational Factor	Correlation Coefficient (r)	Coefficient of Determination (r^2)
"e-learning is right for me"	.404**	.163
"e-learning is not for me"	-.195**	.038
"I don't want to be all by myself"	-.188**	.035

** $p < .01$.

5.3 Summary of the Mixed-Methods Study

A majority of adult learners investigated in the present study indicated that they

started self-directed e-learning to enhance their job skills or for personal development.

Both the qualitative and quantitative data gathered in the present study revealed that the

biggest motivator for the adult learners to choose the self-directed e-learning format was

its flexibility and convenience. Six themes were identified as factors that influenced the

learner's motivation during self-directed e-learning from the analysis of qualitative

interview data: (1) course interactivity, (2) lack of human interactions, (3) application and

integration of knowledge, (4) learner control, (5) psychological influences in the self-directed e-learning environment, and (6) lack of external motivators. Additionally, results of the study showed that the course completion rates were significantly different across course topics and learners in corporate settings were more likely to complete the e-learning course than those in formal education settings were.

The result of factor analysis produced three factors which the learners perceived as important for their motivation in self-directed e-learning: "e-learning is right for me," "e-learning is not for me," and "I don't want to be all by myself." All of these three motivational factors were found to be significantly correlated with the learner's overall satisfaction with the course. In particular, it was found that college students were more likely to be influenced by the third factor ("I don't want to be all by myself") than working professionals. Additionally, results of ANOVA revealed that there were significant differences in the level of learner's perceptions of motivational factors between groups who completed the course and those who did not.

The present study also found that some learners experienced a decline in their motivational level during their self-directed e-learning, where their initial motivational level was high. Moreover, findings from both qualitative and quantitative analyses in the present study showed that the decline in the learner's motivational level during self-directed e-learning was the main reason for the learners who decided not to complete the course, followed by lack of time. Therefore, which factors were associated with the learner's motivational change became the main focus of the present study.

A multiple regression analysis was conducted to investigate which factors significantly contributed to predicting the learner's motivational change, with thirteen

variables on the participants' demographics, their backgrounds in e-learning, and three motivational factors identified from the exploratory factor analysis entered in the regression equation. This stepwise regression analysis resulted in five variables that significantly contributed to predicting the learner's motivational change, which were: (1) the motivational factor "e-learning is right for me," (2) the learner's overall satisfaction with the course, (3) the frequency of the learner's interaction with instructor or technical support staff, (4) the learner's age (negative relationship), and (5) the educational setting in which the e-learning took place (i.e., learners in corporate training settings were more likely to increase in their motivational levels than those in formal education settings). This five-predictor model explained 30.2 percent of the variance in the learner's motivational change. Among these five predictors, the motivational factor, "e-learning is right for me" best explained the variability in the dependent variable, accounting for 22 percent of the variance in the learner's motivational change.

This study also found that the participants exhibited a high level of motivation to continue self-directed e-learning in the future. Findings from both qualitative and quantitative analyses in the present study indicated that the flexibility and convenience of self-directed e-learning was the main reason for the learners to continue this type of learning in the future. Results of correlation analysis showed that the learner's intention to continue self-directed e-learning was significantly positively correlated with the learner's satisfaction level, his or her prior experience with online learning, the amount of time that he or she spent in the e-learning course, and the motivational factor, "e-learning is right for me." Additionally, the learner's intention to continue self-directed e-learning

was significantly negatively correlated with two motivational factors, "e-learning is not

for me" and "I don't want to be all by myself."

CHAPTER VI.

DISCUSSION AND CONCLUSION

This chapter discusses findings from the present study and implications of the findings for the motivational design of self-directed e-learning environments. Limitations of the study and recommendations for future research are also discussed.

5.1 Overall Summary of the Study

The purpose of this study was to investigate what influenced the learner's motivation in self-directed e-learning environments. Lack of motivation has been a concern in theory and practice for facilitating successful online learning environments, yet there has been a lack of knowledge on how to motivate online learners, especially in self-directed e-learning settings, which is a dominant instructional format for adult learners.

To this end, an exploratory mixed-methods study was conducted with adult learners who took self-directed e-learning courses in formal education or corporate training settings. Twelve interviews were conducted for the qualitative part of this study, followed by a Web survey study of 368 adult learners with self-directed e-learning experiences as the quantitative phase of the study. Additionally, a content analysis of e-learning courses was conducted prior to the mixed-methods study using an analysis scheme to describe and understand the overall learning environment in which the study participants were engaged. Key findings from the present study are discussed below.

5.1.1 Overall Design of Self-Directed e-Learning Courses

Three self-directed e-learning courses were purposefully selected as a sample for the content analysis. The content of those e-learning courses was analyzed for the overall course structure, the amount of text and graphics, and the degree of interactivity and learner control provided, using an analysis scheme that I developed. The results of the content analysis of the selected self-directed e-learning courses indicated that these courses had a similar course structure which consisted mainly of presentation of concepts or skills, examples, and practices. Various interactive features were present in those courses, though they were used sparsely across the courses being studied. Also, these e-learning courses provided learners with control in their learning to the extent that the learners could control the pace and the sequence of instruction, and were provided with some options (i.e., display settings, an audio option) that they could set according to their preferences.

Through this content analysis, a deep understanding of the overall design of the e-learning courses under investigation was achieved. This understanding informed the questions to be asked of participants in order to explore the issues on learner motivation in the following mixed-methods study. Readers would also benefit from the results of the content analysis by understanding how the courses were designed and the context in which learners took their e-learning courses.

5.1.2 Learner Motivation for Self-Directed e-Learning

Learner motivation for self-directed e-learning was investigated in the present study based on the framework of learner motivation in Web-based instruction suggested

by Song (2000). Findings on factors that pertain to the learner's motivations to start, persist in, and continue self-directed e-learning are discussed in this section.

Motivations to Start Self-Directed e-Learning

The major motivators for the learner to choose the self-directed e-learning format were its flexibility and convenience. This echoes findings of many other research studies on online learning (National Centre for Vocational Education Research, 2002). This study also found that the major motivation for the learner to start self-directed e-learning was personal or professional development. Moreover, those in formal education settings were more likely to start self-directed e-learning for personal development and those in corporate training settings were more likely to start self-directed e-learning to enhance their job skills. Only a small percentage of learners responded that they started self-directed e-learning to obtain certifications or to fulfill a job requirement or class assignment, which indicates that most learners were intrinsically motivated to learn when they started self-directed e-learning. Such a finding seems consistent with the literature on andragogy indicating that adult learners are generally intrinsically-motivated learners (Brookfield, 1986).

The results of both the quantitative and qualitative research in the present study showed that the learner's initial motivation was high. This finding suggests that the key problem with learner motivation in self-directed e-learning environments was not due to the lack of motivation to start self-directed e-learning. Therefore, it is speculated that the central issue is not how to motivate learners to learn (i.e., providing them with intrinsic motivation to learn), but how to keep learners motivated throughout the course. Hence,

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the learner's motivational change during self-directed e-learning was the focus of this study.

Motivations to Persist in Self-Directed e-Learning

Some participants in this study reported that they did not complete the self-directed e-learning course although they intended to in the beginning. The results of both qualitative and quantitative inquiry in this study showed that lack of motivational quality in the e-learning course was a key factor for some learners who decided not to complete the course, followed by lack of time. These findings are not consistent with the speculation by some practitioners and experts in e-learning that some learners did not complete e-learning courses because they felt they acquired the knowledge that they wanted to get from the course before they completed it (Islam, 2002). Findings from the present study indicate that enhancing the motivational quality of e-learning courses may be the key to learner persistence in the self-directed e-learning environment.

Additionally, the results of the qualitative and quantitative inquires in the present study revealed that there was significant difference in course completion rates across course topics. The results of the present study were not conclusive on the main reason. Since this study was not experimental, no causal relationships could be inferred. The findings from the content analysis of e-learning courses indicated that there some differences in the frequency of interactive features used in e-learning courses across course topics, but the relationship between the amount of interactivity in the course and course completion rates was not inconclusive because there were several confounding variables. First, these courses were different in their content areas and learners may be more motivated to learn in some course topics than others, regardless how the course is

designed. Second, the duration of the courses were different; i.e., the duration of course

soft skills course was short than that of the other two courses (i.e., desktop application

and computer programming courses). Therefore, it is speculated that the difference in the

duration of these courses might have affected the learner's course completion.

Motivational Influences during Self-Directed e-Learning

As the results of the study indicated that motivation was indeed a major issue in

learner attrition in the self-directed e-learning environment, the next step was to identify

which components of this type of learning environment influenced the learner's

motivation. Several themes emerged from the analysis of verbatim transcripts of

qualitative interviews regarding what influenced learners' motivation during the learning

process. First, course interactivity (i.e., human-computer interaction) was important for

learners to stay motivated in the course. Second, for some learners, lack of human

interaction in the e-learning course had a negative influence on their motivation to persist

in their learning. Third, learners reported that course design that allowed them to apply

and integrate knowledge to real-world settings was motivating for them. Fourth, having

control over the pace and the sequence of instruction was also motivating for them. Fifth,

there were some factors inherent in this type of learning environment that helped learners

feel positive about self-directed e-learning. Learners found the learning climate positive

because they could work in the comfort of their home, they felt no pressure of deadlines

or grades, and for some, prior learning experiences helped allay their anxiety about online

learning. Sixth, the lack of external motivators worked as both a motivator and an

inhibitor for the learner. The absence of external motivators may have helped learners

feel no pressure to complete the course, yet the presence of such motivators could have been conducive to motivating them to persist in their learning.

In addition to qualitative interviews, a factor analysis was performed in the quantitative inquiry phase of the present study to investigate which factors influenced the learner's motivation for self-directed e-learning. The results of factor analysis of responses from 368 adult learners revealed three types of motivational attributes toward self-directed e-learning: (1) "e-learning is not for me," (2) "e-learning is right for me," and (3) "I don't want to be all by myself." The last finding is consistent with literature that states social interaction is an important motivational component in online learning environments (e.g., Bonk & Dennen, 2003; Keller, 1999). Additionally, this study found that the absence of social interaction and of external motivators might have more significant influence on students in colleges or universities than on working professionals in terms of motivation to persist in self-directed e-learning.

The present study also found that learners who believed that e-learning was not right for them and that they did not want to learn all by themselves were more likely to drop out of the course than those who believed that e-learning was right for them. This finding suggests that the learner's self-efficacy (i.e., belief in one's own likelihood of success in the self-directed e-learning environment) had significant impact on the learner's decision to stay in or drop out of the course. This finding is consistent with what other research findings indicate about the importance of self-efficacy in learner motivation (Bandura, 1997; Schunk & Pajares, 2001; Zimmerman, 1990).

Motivations to Continue Self-Directed e-Learning

Motivation to continue in the e-learning environment was investigated by asking learners about their intention to continue taking self-directed e-learning courses in the future. A majority of participants in this study responded that they would continue taking self-directed e-learning courses. Interestingly, the learner's continuing motivation was high even among those who dropped out or whose motivational level had declined during self-directed e-learning. It was found that the learner's overall satisfaction with the e-learning course significantly influenced his or her motivation to continue self-directed e-learning. Additionally, it was found that all three motivational attributes of learners were significantly correlated with learners' intention to continue self-directed e-learning.

A majority of the participants responded that the flexibility and convenience of self-directed e-learning was the main reason they would likely take another self-directed e-learning course in the future. For those who responded that they likely would not take another e-learning course in the future, the main reason was boredom. Other main reasons included preference for human interactions in face-to-face classes, and the extra time required to take a self-directed e-learning course compared to a face-to-face class. It was not conclusive, however, that this finding could be generalized to the studied population due to the relatively small number of cases who responded to the question of why they would not take another self-directed e-learning course in the future ($n = 65$). Only 17.7 percent of the total sample of 368 responded to this question because only those who responded that they would not take another self-directed e-learning course were asked to answer this question.

5.1.3 Learners' Motivational Change during Self-Directed e-Learning

The present study found that motivational levels changed for some learners during their self-directed e-learning, while others reported that their motivational level stayed the same. Those learners who reported a decrease in motivational level during the course indicated that the benefits of flexibility and convenience of the self-directed e-learning format were not motivating enough to sustain their motivation to learn. Therefore, it was important to investigate what influenced the change in the learner's motivational level, which was the next research question in the present study.

A stepwise regression analysis was performed to find out what factors were associated with the learner's motivational change during self-directed e-learning. The findings from this regression analysis indicate that the learner's motivation level is more likely to increase under the following conditions: (1) when learners have a high level of perception that e-learning is right for them; (2) when they are satisfied with the overall learning experience in the course, (3) when they interact more often with instructor or technical support staff; (4) when they are younger; and (5) when they are taking the course in a corporate training setting rather than in a formal education setting.

In particular, the best predictor of the learner's motivational change in this five-predictor model was the learner's motivational attribute, "e-learning is right for me." The second and third motivational attributes of e-learning (e.g., "e-learning is not for me" and "I don't want to be all by myself") did not significantly contribute to predicting the learner's motivational change. Therefore, it could be interpreted that motivational levels are likely to increase in learners who feel that e-learning is right for them. For those who believe that e-learning is not for them and who do not like the absence of social

interactions and of external motivators in self-directed e-learning environments, their motivational levels are likely to stay the same during the learning process. Additionally, the results of the multiple regression analysis revealed that course topics did not contribute significantly to predicting the learner's motivational change. Therefore, this finding suggests that course topics are not significantly associated with the learner's motivational change during self-directed e-learning, even though this study found that there were significant differences in the completion rates among learners across different course topics.

It could be argued that some of the variables that belong to the motivational factor "e-learning is right for me," which is the most significant predictor of the learner's motivational change, overlap with three components in Keller's ARCS model of motivational design of instruction (1983) - i.e., attention, relevance, and confidence (see Table 12). Considering that learner satisfaction is another significant predictor of the learner's motivational change as found in the present study, all four motivational components in Keller's ARCS model also appear to be important in the motivation of learners in self-directed e-learning environments. Therefore, the findings of this study indicate that social interactions need to be taken account as well as the four motivational components in Keller's motivational framework when considering learner motivation in self-directed e-learning settings.

5.2 Implications for the Motivational Design of Self-Directed e-Learning Environments

The results of the present study have confirmed other research findings that lack of motivation is the major reason for learner attrition in online learning environments.

Given the findings from this study that some learners experience a change in their motivational level during self-directed e-learning, there are clear implications for designing motivating self-directed e-learning environments. By understanding what is associated with the learner's motivational change during self-directed e-learning, e-learning designers can be better informed on how to create a learning environment in which the learner is expected to sustain his or her motivation to learn during the self-directed e-learning process.

Although e-learning designers cannot control some of the factors that were found to contribute significantly to predicting the learner's motivational change during self-directed e-learning, such as age and educational setting, they can indeed take other significant predictors into account when designing the learning environment to help learners stay motivated. Findings of this study suggest that the learner's motivational level is likely to increase when the e-learning course is designed in a way that is relevant to the learner, has multimedia components and hands-on activities, simulates real-world situations, provides feedback on the learner's performance, and provides easy navigation on its course Web site.

Furthermore, the findings of the present study indicate that in order for motivation to remain constant or increase, the e-learning environment should be designed in a way that makes the learner satisfied with the overall learning experience and that provides him or her with opportunities to interact with an instructor or support staff. Interactions between the learner and instructor or technical staff need to be considered especially when the e-learning courses are designed or delivered for students in college or university settings, because such interactions are more likely to positively influence the motivation

in these learners than in learners in workplace settings. Table 19 summarizes

instructional design principles recommended for sustaining the learner's motivation in

self-directed e-learning.

Table 20

Instructional Design Principles Recommended for Sustaining the Learner's Motivation in

Self-Directed e-Learning

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1. Provide learners with content that is relevant and useful to them.

2. Include multimedia presentations in the course that stimulate the learner's
    interest.

3. Include learning activities that simulate real-world situations.

4. Provide learners with content that the difficulty level of which is just right for
    them.

5. Provide learners with hands-on activities that engage them in learning.

6. Provide learners with enough feedback on their performance.

7. Design the Web site that is easy to navigate.

8. Design the course in a way that the learner is satisfied with the overall learning
    experience.

9. Incorporate some social interactions in the learning process (e.g., interaction
    with instructor, technical support staff, or animated pedagogical agents).

Continuing motivation is also important for learners in self-directed e-learning

environments, because most learners seem to start self-directed e-learning from intrinsic

purposes, and self-motivation is important in such learning environments. The results of

the present study imply that the learner's overall satisfaction with the e-learning course is significantly correlated with his or her continuing motivation. Therefore, it is important for e-learning designers to design a self-directed e-learning environment that provides learners with a satisfying learning experience. Additionally, the findings of the present study that the learner's motivational attributes are significantly correlated with his or her intention to continue self-directed e-learning in the future have implications for the design of e-learning courses. Such findings indicate that e-learning courses need to be designed in ways that increase learners' perception that e-learning is for them, decrease perception that e-learning is not for them, and prevent learners from feeling that they are all by themselves during the self-directed e-learning experience to promote the learner's motivation to continue self-directed e-learning.

5.3 Limitations of the Study

It should be acknowledged that there are some limitations to this study. First, the present study investigated learners who took courses developed by one particular e-learning provider. Because there are numerous e-learning courses in the market today and not every e-learning course is designed in the same way, one might need to use caution when generalizing the findings of this study to learners who participate in self-directed e-learning environments that are dissimilar to the one investigated in the present study.

Also, since this study examined the self-directed e-learning course format, it is likely that the findings of this study might be limited to this particular type of online learning environment. Therefore, readers should take caution not to generalize the

findings of the present study to other types of online learning environments (e.g., formal distance education programs). Additionally, this study focused on adult learners (e.g., adult students and working adults); it is possible that the motivational needs of adult learners might be different from those of school children or younger adults, as suggested by several theorists and researchers (Bohlin & Milheim, 1994; Gibbons & Wentworth, 2001; Wolcott & Burnham, 1991). Therefore, the findings of the present study may not be generalizable to learners of younger ages.

Equally importantly, it should be acknowledged that a non-random sampling method was used for the quantitative inquiry phase of the present study (i.e., the survey study). This fact could affect one's interpretation of the representativeness of the sample in this study. Using a random sampling method could have ensured the representativeness of the sample, thereby increasing the generalizability of the study to the population. However, no mechanism was available in the present study to ensure that every individual in the population had an equal probability of being selected in the sample because I had neither information about nor access to every participant in the population. However, the representativeness of a sample drawn with a non-random sampling method can be improved with a large sample size (Fraenkel & Wallen, 2000). Therefore, I made efforts to collect data from a large sample as a means to ensure the greatest possible representativeness of the sample in the present study. Also, I tried to select the sample carefully so that learners from diverse demographics and backgrounds were included in the sample by using the purposive sampling method in the present study.

5.4 Recommendations for Future Study

It is possible that different factors might influence learner motivation in different types of online learning environments. Since this study was conducted with learners who took a particular type of online course, it is recommended that studies are conducted on what influences the motivation of learners in other types of online learning environments (e.g., instructor-led e-learning courses, and online courses in formal education settings). I suspect that such studies will reveal some motivational factors that were not found in the present study but have significant impacts in other online learning environments, and will also provide insights on whether the findings of the present study can be generalized to other types of online learning environments.

I also recommend that factors that influence the learner's attrition from the e-learning course be investigated in future research studies. Investigation of the factors that influenced learner attrition was not attempted in the present study as it was not the main focus of the study. But I believe that such a study will be beneficial in informing educators and instructional designers on how to design self-directed e-learning environments that foster the learner's motivation to persist in learning. Some studies have been done in Web-based distance education programs (e.g., Groleau, 2004; Tello, 2002), yet such research studies are lacking on self-directed e-learning settings. Findings from such a study may provide one with an empirical basis upon which he or she can understand what factors prevent learners from persisting in self-directed e-learning courses.

The findings from the content analysis in the present study indicated that there were differences in the amount of interactivity across courses. This study did not draw a

conclusion on whether such a difference in the course interactivity might impact learners' motivation (e.g., change in their motivational levels or persistence in learning) because of other confounding variables, such as courses of different topic areas and different learning time across courses under investigation. A study of how the level of course interactivity influences the learner motivation will be beneficial for informing one of how to design interactive activities in e-learning courses to enhance learner motivation.

Additionally, I recommend that factors influencing the learner's continuing motivation be investigated. Although I found from the present study that learners who took e-learning courses were highly motivated to continue self-directed e-learning, it will be still beneficial to find out which factors are important to foster the learner's motivation to continue self-directed e-learning, in order to expand the knowledge base on how to better foster the learner's motivation to continue self-directed e-learning.

Last, I found that motivation to start self-directed e-learning differed among learners in different educational settings – i.e., learners in corporate training settings were more likely to start self-directed e-learning to enhance their job skills, while those in formal education settings were more likely to start it for personal development. Therefore, an investigation into whether such differences in motivation to start self-directed e-learning could impact the learner's motivation to persist in or continue such learning is recommended. Such a study might be beneficial in shedding light on one of the findings from this study: the higher dropout rates among learners in formal education settings than among those in corporate training settings.

5.5 Concluding Remarks

I was indeed quite encouraged to learn from this study that learners were satisfied with their overall learning experience in self-directed e-learning courses, and that many of them were motivated to learn through the end of the course and to continue self-directed e-learning in the future. Yet, my study also revealed that some learners found that their motivation waned during the course, which suggests that there is still some room for improvement in the motivational quality of self-directed e-learning courses. I hope that the results of the present study provide an empirical base which e-learning designers can apply in order to create a highly motivating self-directed e-learning environment.

E-learning is booming in many educational settings, but people often have mixed opinions about the current status and future outlook of e-learning; i.e., from excitement to disappointment (The Learning Alliance for Higher Education, 2004). I believe that improving the motivational quality of e-learning courses will help dismiss some disappointments that people have felt in the effectiveness of e-learning, and will also help create a learning environment that builds success for learners.

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APPENDICES

Appendix A

Analysis Scheme for the Content Analysis

1. Overall Course Structure
   - # of lessons
   - # of units in each lesson
   - Types of learning activities in the lessons
   - Lecture (presenting concepts/skills to be learned)
   - Examples
   - Practice
   - Assessments
   - Others

2. Textual & Graphical Information
   - Average length of text (# of pages per unit, # of words per page)
   - Average # of graphics per page
     - Static images (illustrations, screen captures, photographs, etc.)
     - Dynamic images (animations, movie clips, etc.)

3. Interactivity
   - # of interactive features per page
     - Animations
     - Simulations
     - Drag-and-drop activities
     - Type in the correct answer
     - Multiple-choice questions
     - Others

4. Learner Control
   - Control of the sequence (yes / no)
   - Control of the pace (yes /no)
   - Access to learning support
   - Access to resources
   - Can ask questions and get response
   - Customization / Adaptability
   - Display options (yes /no)
   - Audio option (yes / no)

Appendix B

Interview Protocol

Analyses of Learner Motivation in a Self-Directed Online Learning Environment

Time of Interview:

Date:

Place:

Interviewer:

Interviewee:

　　　Major/Organization:

　　　Status/Title:

Introduction

Thanks for coming to this interview session. You're here today to participate in an interview for a study of learner motivation in online learning environments. The purpose of this interview is for me to learn your experience of taking self-directed e-learning courses, such as OOO courses.

Your name will remain anonymous and any remarks that you make during the interview will remain confidential. The interview will take approximately one hour. Please take a moment to read the study information sheet.

Key Questions

1. Have you taken any online courses before?

2. How would you describe your computer skill level?

3. What motivated you to take the online course?

4. What was the topic of the course that you took and when was it?

5. Why did you choose take this course online over CD-ROM or classroom instruction?

6. Did you complete the course?

- If so, did you find it interesting to take this course?

- If not, what made you decide not to complete the course?

7. Do you think your motivation level had changed while you took this course? If so, how did it change?

8. Would you prefer to take this course in the classroom or over the Internet?

9. What was the most exciting or interesting feature in this course for you?

10. What was the least exciting or interesting feature in this course for you?

11. Would you like to take another online course in the future? Why / Why not?

<u>Concluding Remarks</u>

Thanks for your time for this interview. I want to remind you again that your responses will remain confidential. May I contact you again for follow-up questions and to check if I understand your responses correctly?

Appendix C

E-mail Message Sent to Recruit Survey Participants

Greetings,

I'm a doctoral student in the School of Education at Indiana University Bloomington. I'm conducting a research study on online learner's motivation as part of my doctoral thesis. I am surveying adult learners of their opinions about self-directed e-learning courses offered by e-learning developers such as OOO. The purpose of this study is to identify factors that influence the learner's motivation in e-learning courses.

Would you take 10-15 minutes to participate in my survey? This survey asks about your experiences taking e-learning courses. Results of this study will help improve the motivational quality of e-learning courses. This Web survey is convenient and confidential. You can take the survey by clicking the following link: http://www.indiana.edu/~edsurvey/survey_kim/

You are eligible to take this survey if you spent a few minutes in any of e-learning courses or even if you did not actually go through the course. As a token of my appreciation for your participation in this study, you will receive an online gift certificate worth $7 at Amazon.com when you complete the survey. You can find more information about this study by visiting the above Web site. Please do not hesitate to contact me via e-mail at kykim@indiana.edu should you have any questions about this survey.

Thanks in advance for your participation!

Best regards,

Kyong-Jee Kim

Appendix D

Questionnaire for the Survey Study

INDIANA UNIVERSITY - BLOOMINGTON
STUDY INFORMATION SHEET
[Analyses of Adult Motivation in a Self-Directed Online Learning Environment]

You are invited to participate in a research study. The purpose of this study is to identify factors that influence adult learners' motivation in self-directed online learning environments.

INFORMATION

You'll be asked to complete a survey with questions that pertain to your perceptions of motivational problems in taking self-paced online courses, such as the OOO online training courses. The survey will take 10-15 minutes to complete.

There will be approximately 200 participants involved in this study.

BENEFITS

The results of this study will help educators and instructional designers understand motivational issues that online learners encounter during self-directed learning and to improve the motivational quality of self-directed online learning courses.

COMPENSATION

You will receive a gift certificate worth $7 from Amazon.com after you complete the survey as a token of our appreciation of your time for this study. You will be asked to provide your name and e-mail address at the end of the survey so that we can send you the gift certificate via e-mail.

CONFIDENTIALITY

Your response will be kept confidential. Although you'll be asked to provide your name and your e-mail address to receive your compensation, they will not be linked to your survey responses in any way. Also, no reference will be made in oral or written reports which could link you to the study. The survey data will be kept electronically and the database will be destroyed by December 31, 2005.

CONTACT

If you have questions about the study or the procedure, you may contact the researcher, Kyong-Jee Kim at School of Education; 201 North Rose Room 2224, Indiana University, Bloomington, 47405, via e-mail at kykim@indiana.edu, or via phone at (812)856-8450.

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have not been honored during the course of this project, you may contact the office for the Human Subjects Committee, Carmichael Center, L03, E. Kirkwood

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Avenue, Bloomington, IN 47408, 812/855-3067, or by e-mail at iub_hsc@indiana.edu.

PARTICIPATION

Your participation in this study is voluntary; you may refuse to participate without penalty. If you decide not to participate, you may withdraw from the study at any time without penalty. If you decide to withdraw from the study once you have completed the survey, the investigators will not be able to return it to you since it is anonymous.

Form date: October 5, 2004

IRB Approved
Approval Date: October 19, 2004
Expires: December 31, 2005

Do you agree to participate in the study?

YES   **NO**

A Survey on Learner Motivation in Self-Directed E-Learning

INSTRUCTIONS: This survey asks for your opinions about learner motivation for taking self-directed e-learning courses -- e.g., a OOO e-learning course on computer skills or soft skills offered through your university or organization. If you have taken more than one OOO e-learning course, please think about the one that you took <u>most recently</u> or the one that you are <u>currently</u> taking.

This survey has 60 items and is divided into five Web pages. It will take you 10-15 minutes to complete this survey. Please enter your name and e-mail address at the end of the survey if you would like to receive via e-mail an online gift certificate worth $7 at Amazon.com.

Part I: Background Information

1. Which age group do you belong to?

☐ 24 or younger ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55 or older

2. What is your gender?

☐ Female ☐ Male

3. What is your status? (Please select the one you were when you took the OOO course.)

☐ Student - undergraduate ☐ Student - graduate ☐ Working professional ☐ Other

4. To what type of organization do you belong? (Please select the one you belonged to when you took the OOO course.)

☐ Commercial/Business ☐ Not-for-profit ☐ Government ☐ University/College
☐ Other: [_____]

5. How many hours <u>per week</u> do you use the Internet and the Intranet (e.g. e-mail, the World Wide Web)?

☐ 1-10 hours ☐ 11-20 hours ☐ 21-30 hours ☐ 31-40 hours ☐ 41 hours or more

6. How many software programs (e.g., word processors, Web browsers) do you use on a regular basis?

☐ None ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10 or more

7. What was the topic of the OOO course that you took? (Please choose the most recent one if you took more than one.)

☐ Desktop applications (e.g. Microsoft Office products, Macromedia Studio products)

☐ Internet technologies and programming (e.g., networking, server administration, Java, Oracle)

☐ Professional and business development (e.g., management, sales and marketing, coaching)

8. How many e-learning courses had you taken before you took this course?

☐ None ☐ 1 ☐ 2-3 ☐ 4-6 ☐ 7 or more

9. How much time did you spend taking this OOO course?

☐ Less than one hour ☐ 1-3 hours ☐ 4-6 hours ☐ 7-9 hours ☐ 10 hours or more

10. Which one of the following best describes your motivation for taking this course?

☐ For personal development

☐ To enhance my job skills

☐ To receive a certificate

☐ To complete mandatory training or class assignment

☐ Other: _____

11. For what reason(s) did you choose an online training option? (Please select <u>no more than three</u>)

☐ Classroom training did not fit my schedule.

☐ Classroom training was not available.

☐ Convenience of online learning (learning anytime anywhere)

☐ Flexibility of self-paced learning

☐ Interested in using the computer technology in learning

☐ Cost less than taking classroom instruction

☐ Fit better with my learning style (visual learning, independent learning style, etc..)

☐ Fit better with my personality

☐ Other: _____

12. How would you rate your level of motivation to learn when you began taking this course?

☐ ☐ ☐ ☐ ☐ ☐ ☐
Very low   Moderate   Very high

13. How often did you interact with an instructor or technical support staff while you took this course?

☐ Never ☐ Seldom ☐ Occasionally ☐ Frequently ☐ Very Frequently

Continue

A Survey on Learner Motivation in Self-Directed E-Learning

Part II: Motivational Factors

INSTRUCTIONS: The following statements ask your opinions about the motivational aspects of the self-directed e-learning course that you took. Please indicate your response to each of the following statements by checking ONE of the five responses from "strongly disagree" to "strongly agree" for each statement.

14. The course content was related to things I already knew.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

15. I liked being able to learn at my own pace.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

16. I did not have enough technical skills to be successful in e-learning.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

17. The difficulty level of course content was just right for me.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

18. I liked being able to skip content that was too easy for me.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

19. Some learning tasks in the course were too challenging for me.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

20. The course should have more interactive features (e.g., games, simulations) to keep me interested.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

21. I would like to take a shorter class that focuses on what I really need to learn.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

22. I often forgot to go back to the course when I took this e-learning course.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

23. Technical difficulties that I encountered while I took this course frustrated me.

☐ Strongly Disagree ☐ Disagree ☐ Undecided ☐ Agree ☐ Strongly Agree

24. The presence of an instructor would be helpful for my learning in this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

25. There should be some type of recognition (e.g., reward, certification) to motivate me to get through the course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

26. I felt anxious or frustrated when I had to take tests or quizzes in this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

27. There should be more explanations or examples of how people can apply what they learn in this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

28. I experienced too many disruptions to get through the course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

29. Hands-on activities in this course helped me engage in learning.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

30. The course simulated real-world situations.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

Continue

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A Survey on Learner Motivation in Self-Directed E-Learning

Part II: Motivational Factors – Continued

INSTRUCTIONS: The following statements ask your opinions about the motivational aspects of the self-directed e-learning course that you took. Please indicate your response to each of the following statements by checking ONE of the five responses from "strongly disagree" to "strongly agree" for each statement.

31. I would prefer to use other medium (e.g. CD-ROM, video) for a self-paced course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

32. This course format was not suited to my learning style.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

33. I wanted to get answers to my questions from an instructor.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

34. Taking a self-directed e-learning course was worthwhile.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

35. The course content was useful to me.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

36. Multimedia presentations (e.g., graphics, audios, videos) in this course stimulated my interest.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

37. There should be many resources that I can explore in the course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

38.I would prefer to interact with peers rather than to learn on my own in an online course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

39. I needed to be under a deadline to complete this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

40. I received enough feedback on my performance in this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

41. The course website was easy to navigate.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

42. I was interested in learning through technology as a way to enhance my technical skills.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

43. I was overwhelmed with the amount of information presented in this course.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

44. The course content was relevant to my interests.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

45. My institution was supportive of my e-learning.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

46. It was important for me to complete this course.

☐ Strongly Disagree　☐ Disagree　☐ Undecided　☐ Agree　☐ Strongly Agree

Continue

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A Survey on Learner Motivation in Self-Directed E-Learning

Part III: Motivation to Persist / Continue

INSTRUCTIONS: This part of the survey asks your opinions about the factors that impact your persistence in self-directed e-learning and your motivation to continue self-directed e-learning. Please choose the answer that best describes your situation.

47. How would you rate your level of motivation to learn after you went through some lessons in this course?

☐   ☐   ☐   ☐   ☐   ☐   ☐

Very low   Moderate   Very high

48. Did you intend to complete the course when you started it?

☐ Yes   ☐ No   ☐ Don't know

49. If you answered <u>No</u> to question 48, which one of the following best describes your reason for not having intended to complete the course?

☐ Lack of time

☐ Wanted to go through only specific topics within the course.

☐ Did not want to take the tests in the course.

☐ There was no reward or pressure for completing it.

☐ Other: _____

50. Did you actually finish all the lessons in the course?

☐ Yes   ☐ No   ☐ Still in progress   ☐ Don't know

51. If you answered <u>No</u> to question 50, which one of the following best describes your reason for not completing the course?

☐ I was too busy.

☐ The content was not relevant to me.

☐ There were technical difficulties

☐ It was too difficult or easy for me.

☐ It was too boring.

☐ I got all the information that I needed to get.

☐ Other: _____

52. How satisfied are you with this e-learning course?

☐ Very dissatisfied

☐ Somewhat dissatisfied

☐ Neutral

☐ Somewhat satisfied

☐ Very satisfied

53. How did your motivational level change as you went through the course?

☐ Decreased a lot

☐ Decreased a little

☐ Stayed the same

☐ Increased a little

☐ Increased a lot

54. Would you choose to take another e-learning course in the future even if there are other options (e.g., classroom courses, instructor-led online courses)?

☐ Yes   ☐ No   ☐ Don't know

55. If you answered Yes to question 54, what would be the main reason?

☐ I can learn anytime and anywhere.

☐ I can control the pace of my learning.

☐ The design of the course has drawn my interest in the topic.

☐ It costs less than classroom instruction.

☐ Lack of other training options

☐ Use of technology for learning

☐ Other: _____

56. If you answered <u>No</u> to question 54, what would be the main reason?

☐ Technical difficulties

☐ It is too boring.

☐ It takes more time to take online courses than to take classroom courses.

☐ Less effective than classroom instruction

☐ I prefer human interaction in classroom instruction.

☐ Difficulty of self-paced learning without an instructor present

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☐ Lack of learner support in self-directed online learning environments

☐ Other: [_____]

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A Survey on Learner Motivation in Self-Directed e-Learning

Part III: Motivation to Persist / Continue

INSTRUCTIONS: This part of the survey asks your opinions about the factors that impact your persistence in self-directed e-learning and your motivation to continue self-directed e-learning. Please choose the answer that best describes your situation.

57. I spent as much time as needed to achieve my learning goal in this course.

☐ Strongly Disagree   ☐ Disagree   ☐ Undecided   ☐ Agree   ☐ Strongly Agree

58. How likely are you to take another OOO e-learning course in the future?

☐   ☐   ☐   ☐   ☐   ☐   ☐

Very <u>un</u>likely   Neutral   Very likely

59. How likely are you to complete the course if you take another e-learning course in the future?

☐   ☐   ☐   ☐   ☐   ☐   ☐

Very <u>un</u>likely   Neutral   Very likely

60. What would make self-directed e-learning courses more interesting and engaging for you?

Thanks for Completing the Survey.

Please type in your name and e-mail address in the boxes below if you would like to receive an online gift certificate. A gift certificate worth $7 at Amazon.com will be sent to you at the e-mail address that you supply below in 1-2 weeks after you submit your survey.

Your name:

Your e-mail address:

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CURRICULUM VITA: KYONG-JEE KIM

EDUCATION

Ph. D. Indiana University, Bloomington, IN. 2005.
Major: Instructional Systems Technology (IST), Minor: Information Technology.

M. S. Indiana University, Bloomington, IN. 1996. Major: Instructional Systems Technology.

B. A. Korea University, Seoul, Korea. 1994. Major: Horticultural Sciences.

Certificate of Completion. University of Florida, Gainesville, FL. 1994. English Language Institute.

WORK EXPERIENCE

Employment History

09/04 – 05/05	**Graduate Assistant**. Department of Instructional Systems Technology, Indiana University, Bloomington.
01/02 – 07/04	**Student Technology Center Consultant & Graduate Assistant.** University Information Technology Services, Indiana University.
05/99 - 12/01	**Freelance Course Developer/Instructor.** - Evercation, Inc., Seoul, Korea - JungChul InterLab, Inc., Seoul, Korea - LG Corporate Institute of Technology, Seoul, Korea.
09/96 - 11/98	**Instructional Designer & Web Developer.** LG Electronics, Inc., Korea.
05/96 - 08/96	**Web Developer.** Neo Communications, Inc., San Francisco, CA.
05/95 - 07/95	**Intern.** Agency for Instructional Technology (AIT), Bloomington, IN.

Professional Experiences

07/04 – 07/05	**e-Learning Consultant**. CourseShare, LLC., Bloomington, IN.
01/04 – 06/05	**Research Fellow**. Kelley Direct Online Programs Research Group. Indiana University.
11/03 – 08/04	**Associate Researche**r. Institute of APEC (Asia-Pacific Economic Cooperation) Cyber Education (IACE), Bloomington, IN.
2003	**Contributor**. Wrote two chapters on Macromedia Flash® in Bardzell, S., & Bardzell, J. (2004). *Macromedia Studio MX 2004: Training from the source*. Berkeley, CA: Macromedia Press.
Fall, 2003	**Instructional Assistant.** R521 (Instructional Design & Development I). Department of Instructional Systems Technology, Indiana

University, Bloomington.

Spring, 2003	**Instructional Assistant.** Distance R547 (Computer-Mediated Learning). Department of Instructional Systems Technology, Indiana University, Bloomington.
01/02 – 08/02	**Graduate Research Associate**. Center for Research on Learning and Technology, School of Education, Indiana University, Bloomington.
Fall, 2001	**Teaching Assistant.** Adult Education Program Computer Classes. Monroe County Community School Corporation, Bloomington, IN.
2001 – 2002	**E-Learning Seminar Translator/Facilitator**. Indiana University School of Education and CourseShare, LLC.

AWARDS / HONORS / GRANTS

2002 – 2005	**Graduate Assistantships**. Indiana University.
2005	**GPSO Research Grant**. Indiana University.
2004	**GPSO Travel Grant**. Indiana University.
01/2003	**Jerrold E. Kemp IST Fellowship Award**. Indiana University.
02/2002	**Fee Assistance Award**. Indiana University.
09/2001	**L. C. Larson Professional Development Award**. Indiana University.
09/1998	**Champion Employee Award**. LG Electronics, Inc.
12/1997	**Highest Rank**. TOEIC (Test of English for International Communication).Official test administered by ETS.
05/1994	**Academic Excellence Awards**. University of Florida.
1989 – 1991	**Fee Assistantships**. Korea University.