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Components of Social Cognitive Theory Predict Military Students' Satisfaction with Self-Paced, Online Training

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Abstract

Many would agree that learning on the Web--a highly autonomous learning environment--may be difficult for individuals who lack motivation and self-regulated learning skills. Using a social cognitive view of academic motivation and self-regulation, the objective of the present study was to investigate the relations between students' motivational beliefs, their perceptions of the learning environment, and their satisfaction with a self-paced, online course. Service academy undergraduates ($N = 646$) completed a questionnaire following online training. Pearson correlations indicate that task value, self-efficacy, and perceived instructional quality were significantly positively related to each other and to students' overall satisfaction with the self-paced, online course. Additionally, results from a three-step hierarchical regression reveal that task value, self-efficacy, and instructional quality were significant positive predictors of students' satisfaction; the final regression model accounted for approximately 54% of the variance in the outcome measure. These findings support and extend prior research in traditional classrooms and online education in university settings, indicating that military students' motivational beliefs about a learning task and their perceptions of instructional quality are related in important ways to their overall satisfaction with online instruction. Educational implications and suggestions for future research are discussed.

Components of Social Cognitive Theory Predict Military Students' Satisfaction with Self-Paced, Online Training

In recent years, online learning has emerged as a viable alternative to conventional, face-to-face instruction (Bernard et al., 2004b; Larreamendy-Joerns & Leinhardt, 2006; Tallent-Runnels et al., 2006). As a subset of a much larger form of instruction, distance education, online learning has become the format-of-choice for numerous institutions eager to provide students with the opportunity and convenience of learning from a distance (Moore & Kearsley, 2005; Simonson, Smaldino, Albright, & Zvacek, 2003). Due, in part, to recent advances in Internet-based technologies, what was once considered a poor substitute for traditional classroom instruction has finally entered mainstream education (Moore, 2003; Moore & Kearsley, 2005).

Evidence of the tremendous growth in online learning is not difficult to find. For example, the U.S. Department of Defense, an organization that spends more than $17 billion annually on military training, recently committed to the development of the Advanced Distributed Learning (ADL) network. The ADL initiative is designed to capitalize on the capabilities of computer technology to make education and training available to the military's more than three million personnel any time, anywhere, and online instruction is considered a critical component of the ADL network (Fletcher, Tobias, & Wisher, 2007). Likewise, postsecondary institutions have recognized the utility of online learning. A recent survey of 2,200 U.S. colleges and universities by the Sloan Consortium (2006) found that 96% of large institutions (greater than 15,000 total enrollments) have some online offerings; 62% of Chief Academic Officers rated learning outcomes in online education as the same or superior to traditional, face-to-face instruction; and overall online enrollment increased from 2.4 million in 2004 to 3.2 million in 2005.

Traditionally, research in the area of online learning, specifically, and distance education, more generally, has focused primarily on group comparisons (e.g., online/distance learners versus traditional classroom learners; Berge & Mrozowski, 2001; Bernard et al., 2004b; Phipps & Merisotis, 1999; Russell, 1999). With few exceptions, results from these studies have suggested that, "the learning outcomes of students using technology at a distance are similar to the learning outcomes of students who participate in conventional classroom instruction" (Phipps & Merisotis, 1999, p. 1). In fact, this outcome has become so prevalent in the distance learning literature that Russell (1999) has dubbed it the *no significant difference phenomena*.

Recently, however, a number of authors (Abrami & Bernard, 2006; Bernard, Abrami, Lou, & Borokhovski, 2004a; Bernard et al., 2004b; Dillon & Greene, 2003; Gibson, 2003; Perraton, 2000; Saba, 2000) have identified major deficiencies in the extant research on distance learning. Along with a plethora of methodological problems, which have long plagued the empirical literature, two important issues have been identified. First, a large proportion of the distance education research has emphasized comparisons of achievement outcomes *between* groups of distance and traditional learners, at the expense of any consideration for *within* group variation in achievement and satisfaction among distance learners. Second, much of the research has lacked a theoretical or conceptual framework. In response to these problems, experts in the field of distance education (Abrami & Bernard, 2006; Bernard et al., 2004a, 2004b; Moore & Kearsley, 2005; Perraton, 2000; Phipps & Merisotis, 1999; Saba, 2000) have challenged researchers to (1) move beyond group comparison studies and focus future research on within group differences among distance learners (i.e., those attributes--motivational, cognitive, and otherwise--that contribute to success in distance learning environments); and (2) conduct research that is grounded in learning theory and which builds on the work of others.

The present study represents the second phase of a research program designed to address the recommendations outlined above. Specifically, using a social cognitive view of self-regulation as a theoretical framework (Bandura, 1991; Zimmerman, 2000a), this study explores the relations between students' motivational beliefs (task value and self-efficacy), their perceptions of the learning environment (perceived instructional quality), and their overall satisfaction with a self-paced, online course. Self-paced, online courses are a specific type of online training in which students use a Web browser to access a course management system and complete Web-based courses at their own pace. While completing these courses, students do not interact with an instructor or other students. Ultimately, the present investigation is designed to extend the robust literature on the importance of motivation and self-regulation in conventional classrooms, and the more limited research on motivation and self-regulation in online education, to self-paced, online learning in the context of an authentic military training environment.

Review of the Literature

Online Learning and Student Autonomy

The recent growth in online learning has resulted in a major shift in education and training from an instructor-centered to a learner-centered focus (Dillon & Greene, 2003; Garrison, 2003). Whereas teachers in traditional classrooms might normally provide guidance and structure for their students (e.g., additional direction for noticeably confused individuals and explicit feedback during classroom discussions), students learning online, and in the absence of an ever-present instructor, must take greater responsibility for the management and control of their own academic progress (Dabbagh & Kitsantas, 2004; King, Young, Drivere-Richmond, & Schrader, 2001; Schunk & Zimmerman, 1998). As Moore and Kearsley (1996) so aptly stated in the first edition of their seminal work on distance education, "while students will have more

freedom and opportunity, they must also assume more responsibility for managing their own learning, in terms of when they will study, how much they want to learn, and seeking out information and resources" (p. 16).

In light of these concerns, numerous researchers have argued that online students, to an even greater extent than traditional learners, require well-developed self-regulated learning (SRL) skills to guide their cognition and behavior (Bandura, 1997; Dillon & Greene, 2003; Hartley & Bendixen, 2001; Hill & Hannafin, 1997). For example, in their edited volume regarding the instructional implications of academic self-regulation, Schunk and Zimmerman (1998) concluded that effective self-regulatory strategies may be critical in distance learning situations due to the high degree of student autonomy resulting from the instructor's physical absence. The authors recommended that future research on self-regulation investigate the motivational beliefs and cognitive processes that contribute to student achievement in and overall satisfaction with distance learning.

Self-Regulated Learning

Self-regulated learning has been defined as, "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (Pintrich, 2000, p. 453). Self-regulated learners are generally characterized as active participants who efficiently control their own learning experiences in many different ways, including establishing a productive work environment and using resources effectively; organizing and rehearsing information to be learned; and holding positive motivational beliefs about their capabilities, the value of learning, and the factors that influence learning (Schunk & Zimmerman, 1994, 1998).

Interest in academic self-regulation has increased considerably in recent years as investigators and practitioners attempt to understand how students become masters of their own learning processes (Dabbagh & Kitsantas, 2004; Schunk & Zimmerman, 1998). Overall, research in traditional classrooms has consistently found moderate to strong positive relations between students' motivational engagement, their use of SRL strategies, and, ultimately, their academic achievement and overall satisfaction (Pintrich, 1999; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). For example, in a survey study of 356 college undergraduates learning in traditional classrooms, Pintrich, Smith, Garcia, and McKeachie (1993) found that adaptive motivational beliefs were positively correlated with students' self-reported use of deep processing strategies and their academic performance, as measured by final course grade.

Although there are various conceptualizations of academic self-regulation (for a review, see Boekaerts, Pintrich, & Zeidner, 2000), several researchers have found social cognitive models of SRL to be particularly useful in analyzing student success in online courses (for a review, see Hodges, 2005; Militiadou & Savenye, 2003). Social cognitive models distinguish themselves from purely cognitive theories in that they focus on the interrelationship among students' motivational beliefs (e.g., self-efficacy and task value), their use of self-generated learning strategies (e.g., rehearsal, elaboration, and metacognition), and their overall academic success (e.g., course grades and learning satisfaction). Moreover, social cognitive models are concerned with explaining how these personal beliefs and behaviors are ultimately influenced by characteristics of the learning environment. Thus, a social cognitive perspective on self-regulation, which addresses the interrelationship between the learner, the learner's behavior, and the academic environment (Bandura, 1986, 1997), appears to lend itself well to an understanding of how successful students function in highly autonomous online learning situations.

Motivational Influences on Self-Regulation and Satisfaction

Much of the research on self-regulation in online education has focused on identifying the motivational, cognitive, and behavioral characteristics of effective self-regulated learners, as well as trying to understand how these components relate to each other and to adaptive academic outcomes. Using primarily non-experimental, correlational methods, most studies have mirrored the earlier research on self-regulation in traditional classrooms (see, for example, Pintrich & De Groot, 1990; Pintrich & Garcia, 1991; Pintrich et al., 1993). In general, these investigations have attempted to discern if the relationships found in conventional classrooms generalize to online learning environments.

Recently, several researchers have investigated the importance of task value as a predictor of adaptive learning outcomes in both traditional classrooms and online settings. Eccles and Wigfield (1995) have defined task value as the extent to learners find a task interesting, important, and/or valuable. In general, studies of online learners have revealed that task value beliefs positively predict students' metacognition and use of learning strategies (Artino & Stephens, 2006; Hsu, 1997), academic performance and satisfaction (Lee, 2002; Miltiadou & Savenye, 2003); and future enrollment choices (Artino, in press). Beyond just a few studies, however, little is known about how students' task value beliefs relate to other adaptive outcomes in online education. Moreover, a review of the literature revealed only one study, Artino (in press), that investigated this relationship in the context of self-paced, online training in the military. However, the internal validity of Artino's (in press) findings is somewhat limited in that his students did not report on their experiences with the same online course. Instead, participants were asked to respond to survey items while keeping in mind what they considered to be the most effective self-paced, online course they had completed within the last two years. This

failure to control for the specific course is considered a significant methodological limitation – a limitation that is addressed by the present study.

Another commonly-researched motivational construct in both traditional and online settings is students' perceived self-efficacy; that is, students' confidence in their ability to attain designated types of performances (Bandura, 1997). According to Schunk (2005), "self-regulated learners are more self-efficacious for learning than are students with poorer self-regulatory skills; the former believe that they can use their self-regulatory skills to help them learn" (p. 87). Overall, research results from studies of online education have revealed that when compared to their counterparts with lower perceived self-efficacy, efficacious students report more use of learning strategies (Artino & Stephens, 2006; Joo, Bong, & Choi, 2000); increased satisfaction and greater likelihood of enrolling in future online courses (Artino, in press; Lim 2001); and superior academic performance (Hsu, 1997; Joo et al., 2000; Lee, 2002; Lynch & Dembo, 2004; Wang & Newlin, 2002). For example, in one of the more comprehensive studies of self-efficacy and its relationship to student satisfaction and choice behaviors, Lim (2001) surveyed 235 adult learners at five American universities and found that computer self-efficacy, along with a linear combination of experiential variables, explained 15% of the variance in students' overall satisfaction and 12% of the variance in their intentions to enroll in future online courses. Ultimately, however, there is a dearth of research on the importance of students' self-efficacy in the context of self-paced, online training in the military.

Study Objectives and Research Question

Findings from the online learning literature, although limited, seem to support research results from traditional classrooms indicating that students' motivational beliefs about a learning task are positively related to adaptive academic outcomes. However, the bulk of the existing

research in this area has been conducted in the context of online education at civilian universities and not online training in military settings. And although education and training share many of the same psychological constructs (e.g., learning, transfer, memory, and motivation), the two contexts are distinguished from one another by fundamental differences in their objectives, performance outcomes, and the ultimate application of the underlying instruction (Bonk & Wisher, 2000). In education, the traditional focus is on developing the whole person, both socially and intellectually, and there is no "upper limit" as to how lofty these learning outcomes should be. In other words, educational providers are not normally concerned with "over educating" their students. The same cannot be said of military training, where instructors are focused on training individuals to perform specific job tasks. Therefore, once a pre-specified level of proficiency has been met, additional training becomes costly, in terms of time and money, and military leaders would rather have their personnel productive on the job than remain in the classroom (Bonk & Wisher, 2000; United States General Accounting Office, 2003).

Considering these fundamental differences, the present study seeks to determine if the relationships between SRL variables generalize to military students learning in a self-paced, online environment. Specifically, the following research question was addressed: After controlling for demographic and experiential variables, how accurately can a linear combination of task value, self-efficacy, and perceived instructional quality predict military students' overall satisfaction with a self-paced, online course? Satisfaction was chosen as the outcome of interest because several researchers have reported that student satisfaction with online learning is a powerful predictor of course drop-out rate, as well as students' intentions to enroll in future online courses (for a review, see Dabbagh & Bannan-Ritland, 2005; Moore & Kearsley, 2005; Simonson et al., 2003). Consistent with findings in traditional classrooms and online education in

civilian universities, it was hypothesized that all three independent variables would be significant positive predictors of military students' satisfaction with a self-paced, online course.

Method

Participants

A convenience sample of approximately 780 students from a U.S. service academy were invited to participate in the present study. A total of 646 students completed the survey (response rate = 83%). The sample included 514 men (80%) and 113 women (17%); 19 participants (3%) did not report gender. The mean age of the participants was 20.4 years (SD = 1.0; range 18-24). Information regarding ethnicity was not collected as part of this study.

Instructional Materials

The instructional materials used in the present study consisted of a self-paced, online course developed by the U.S. Navy. The online course was the first part of a two-stage training program in fight physiology and aviation survival training that was required for all service academy undergraduates (sophomores and juniors). Moreover, the online course was designed to be taken prior to students' completion of the second stage of their training, which consisted of traditional, face-to-face instruction at a local training unit.

The online course was composed of four, 40-minute lessons. Each lesson included text, graphics, video, and interactive activities, as well as end-of-lesson quizzes that consisted of 12 to 15 multiple-choice and true/false, declarative knowledge-type questions. The entire course was designed as a mastery learning experience, and so students had to score ≥ 80% on each of the four end-of-lesson quizzes to successfully "pass" the training. While working through the course, students who did not score ≥ 80% on any given quiz could return to the lesson, review the material, and then retake the quiz. Quiz items were drawn from a pool of test questions, and thus

each time an end-of-lesson quiz was attempted, the items were slightly different than the previous assessment. A student's final grade in the course was computed as the average of the four end-of-lesson quizzes. Due to limitations imposed on the researcher by the U.S. Navy, students' final grades could not be collected and analyzed as part of the present study.

Procedures

Approximately one month after completing the online course, participants arrived at a local training unit for the face-to-face portion of their instruction. Prior to any classroom training, students were invited to complete an anonymous, self-report survey. Participation in the survey was completely voluntary.

Instrumentation

The instrument used in the present study was composed of 48 items divided into two sections. The first section included 36 Likert-type items with a response scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). The items in this section were further subdivided into four subscales designed to assess students' personal motivational beliefs (self-efficacy and task value), perceptions of instructional quality, and overall satisfaction with their online learning experience. All of the variables derived from this survey were created by computing means of the items associated with a particular subscale.

Personal motivational beliefs. Two subscales were developed to assess students' personal motivational beliefs. The first was a 14-item *task value* subscale designed to assess students' judgments of how interesting, useful, and important the online course was to them. Subscale items were developed using expectancy-value theory as the guiding framework (see Eccles & Wigfield, 1995). Sample items include: In the long run, I will be able to use what I learned in this course; I was very interested in the content of this course; and I liked the subject matter of this

course. The second subscale was composed of seven items designed to assess students' confidence in their ability to learn the material presented in the online course; that is, their *self-efficacy* for learning with self-paced, online courseware. Subscale items were developed using self-efficacy as the guiding framework (see Bandura, 1997). Sample items include: Even in the face of technical difficulties, I am certain I can learn the material presented in an online course; I can perform well in a self-paced, online course; and I am confident I can learn without the presence of an instructor to assist me.

Instructional quality. A seven-item *instructional quality* subscale was developed to assess students' beliefs that the online course utilized effective instructional methods and design features. Sample items include: The instructional graphics helped me understand the material; The course was easy to navigate; and The end-of-module quizzes helped me learn the material.

Satisfaction. An eight-item *satisfaction* subscale was developed to assess students' overall satisfaction with the self-paced, online course. Sample items include: I look forward to taking more online courses in the future; This online course met my needs as a learner; and Overall, I was satisfied with my online learning experience.

The second part of the survey contained background and demographic items, including two individual items used as control variables in the present study:

(1) *Online technologies experience*. Experience with online technologies was assessed with a single self-report item: In your estimation, how experienced are you using online computer technologies (for example, using a Web browser, surfing the Internet, etc.)? The response scale ranged from 1 (*extremely inexperienced*) to 7 (*extremely experienced*).

(2) *Online learning experience*. Experience with self-paced, online learning was assessed with a single self-report item: In your estimation, how experienced are you with self-paced,

online learning (for example, courses like the online portion of this NASTP course)? The response scale ranged from 1 (*extremely inexperienced*) to 7 (*extremely experienced*).

Results

Exploratory Factor Analysis

Prior to conducting any statistical analyses aimed at answering the primary research question, a principal axis factor analysis with oblique rotation (Oblimin; delta = 0) was completed on the 36 items that made up the four hypothesized subscales (see recommendations in Preacher & MacCallum, 2003). Oblique rotation methods allow for factors to be correlated, and the assumption was made that the four factors thought to be present in the instrument were related (Netemeyer, Bearden, & Sharma, 2003).

The number of factors to extract was determined on the basis of several criteria, including parallel analysis, examination of the resulting scree plot, and eigenvalues greater than 1.0 (i.e., the K1 criterion; Hayton, Allen, & Scarpello, 2004). Results from all three criteria suggested that five factors should be retained.

The five initial factors extracted accounted for 52.8% of the total variance in the items. Inspection of the table of communalities revealed that the majority of the items had high extracted communalities (i.e., > 0.40), which indicates that much of the common variance in the items can be explained by the three extracted factors (Pett, Lackey, & Sullivan, 2003). Only three items had extracted communalities < 0.40.

Several rules were used to determine the number of factors and individual items to be retained in the final solution: (1) factors needed to contain at least three items; (2) all factor pattern coefficients needed to be > |0.50| on at least one factor; and (3) items with factor pattern coefficients ≥ |0.30| on more than one factor were dropped (see recommendations in Pett et al.,

2003). Using these guidelines, four factors were retained in the final solution: (1) a nine-item *task value* subscale (α = .89); (2) a six-item *self-efficacy* subscale (α = .89); (3) a seven-item *instructional quality* subscale (α = .87); and (4) a six-item *satisfaction* subscale (α = .88). The fifth factor contained four items with factor pattern coefficients ≥ |0.30| on more than one factor; therefore, this factor was dropped from the final solution. Internal reliability estimates (Cronbach's alpha) for the four resulting subscales were quite good (see guidelines in Gable & Wolfe, 1993).

Descriptive Statistics

Table 1 presents means and standard deviations for the variables used in the present study. Results indicate a mean slightly above the midpoint of the response scale and a standard deviation between 0.92 and 1.29 for each of the variables. Although the frequency distributions are not provided here, the distributions for the four subscales and two experiential control variables show some evidence of negative skew.

Pearson Correlations

Table 1 also presents results from the correlation analysis. As expected, results indicate that task value, self-efficacy, and perceived instructional quality were significantly positively related to each other and to students' overall satisfaction with the online course. Additionally, the experiential control variables were significantly positively related to each other and to students' self-reported task value, self-efficacy, instructional quality, and overall satisfaction with the course. Gender and age were not significantly related to any of the variables measured in the present study. Overall, these results indicate that when considered individually, the predictor variables of task value, self-efficacy, and perceived instruction quality explained from 22% to

42% of the variance in students' satisfaction with the self-paced, online course; considered a large effect size, in accordance with Cohen's (1988) guidelines.

Insert Table1 Here

Regression Analysis

A three-step hierarchical regression was conducted to explore further the relationships between task value, self-efficacy, perceived instructional quality, and students' overall satisfaction with the online course. For this analysis, the independent variables were grouped into three construct sets. In step 1, control variables (gender [male = 0; female = 1], age, online technologies experience, and online learning experience) were added to the model, followed by motivational beliefs (task value and self-efficacy) in step 2 and perceived instructional quality in step 3. Steps 2 and 3 were entered in an order consistent with ecological models (Bronfenbrenner, 1979); that is, based on their purported proximity to the learner.

Table 2 provides a summary of the hierarchical regression analysis. As indicated, after controlling for demographic and experiential variables, a linear combination of task value, self-efficacy, and instructional quality significantly predicted students' satisfaction with the course, $F(7, 611) = 103.77$, $p < .001$. Moreover, task value ($\beta = .31$, $p < .001$), self-efficacy ($\beta = .19$, $p < .001$), and instructional quality ($\beta = .40$, $p < .001$) were all significant positive predictors of students' satisfaction. The final regression model with seven predictors (four control variables and three components of academic self-regulation) explained approximately 54% of the variance in students' satisfaction; a large effect size, in accordance with Cohen's (1988) guidelines.

Insert Table 2 Here

Discussion

Findings from the present study support prior research indicating that students' motivational beliefs about a learning task and perceptions of instructional quality are related to positive academic outcomes. In particular, results are significant in that they take much of what has been confirmed in traditional classrooms and online education and provide some evidence that these relationships extend to self-paced, online learning in the context of an authentic military training course. Consistent with expectations, students' self-reported task value, self-efficacy beliefs, and perceptions of instructional quality were significant positive predictors of their overall satisfaction.

After accounting for the other variables in the final regression model, task value was a significant individual predictor of students' overall satisfaction. It appears that students who believed the course was interesting and important were more likely to be satisfied with the training. These findings parallel the work of Pintrich and De Groot (1990) who found that intrinsic value was strongly related to students' positive attitudes, cognitive engagement, and academic performance. Similarly, in a study of undergraduates enrolled in four different online courses, Lee (2002) found that task value was a significant positive predictor of students' overall satisfaction.

Likewise, after controlling for the other variables in the final regression model, self-efficacy was a significant individual predictor of students' overall satisfaction with the online training. These results are consistent with the findings of previous investigations of self-efficacy and its relations to adaptive outcomes, including students' performance and satisfaction in traditional classrooms (Pintrich & De Groot, 1990; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990). Moreover, these findings mirror the work of Artino (in press),

indicating that the positive relationship between self-efficacy and satisfaction is equally robust when considering students who are reporting on the *same* self-paced, online course.

Finally, after accounting for the other variables, perceived instructional quality was the strongest individual predictor of overall satisfaction. It seems that students' who felt the course utilized effective instructional methods were also more likely to be satisfied with their online learning experience. These findings are consistent with results that have been reported elsewhere in the online learning literature (for a review, see Moore & Kearsley, 2005; Simonson et al., 2003). For example, in a study of 222 adult learners, Reinhart and Schneider (2001) found that perceptions of the distance learning environment were significantly related to students' overall satisfaction.

Educational Implications

Results from this study suggest some preliminary implications for developers of online military training. In particular, instructional designers may do well to consider creating online courses in a way that enhances both their students' valuing of the required learning tasks and their sense of efficacy to complete those tasks (Artino, in press; Artino & Stephens, 2006). For example, integrating course content with authentic, real-world issues can not only capture students' immediate interest but can also help them appreciate the broader relevance and importance of what they are learning (Bransford, Brown, & Cocking, 2000). Moreover, students' sense of self-efficacy can be promoted in several ways, including providing inexperienced learners with achievable online tasks and scaffolding students' self-regulation by embedding timely and explicit feedback into all self-paced course activities (Bandura, 1997; Zimmerman, 2000b). Although none of these suggestions are unique to online learning, they are considered by

many experts to be "best practices" for all types of instruction (American Psychological Association, 1997; Bransford et al., 2000).

In addition, because perceived instructional quality seems to be an important predictor of students' overall satisfaction, course designers may want consider employing high-quality design elements in their online courses in order to boost perceived instructional quality. The common practice of simply transforming face-to-face training into low-quality, "page-turner" instruction is likely to be a completely inadequate approach (Bonk & Wisher, 2000). Although more research is needed (Fletcher et al., 2007), the use of high-quality design elements *may* help course designers as they strive to tailor instruction to meet the cognitive and motivational requirements of their online military learners.

Finally, results from the present study provide researchers, practitioners, and policy makers with important insights into the motivational characteristics of students who seem to be most satisfied with self-paced, online training. For example, a survey such as the one employed in the present study could be used as an immediate diagnostic tool to identify "at-risk" students who may need additional support or scaffolding in order to successfully complete an online course (Moore & Kearsley, 2005). Using this simple, proactive approach, organizational leaders and decision makers could know ahead of time which students are likely to have more difficulty regulating their own learning activities and thus require more assistance with the management and control of their online training experience.

Study Limitations and Future Directions

Ultimately, results from the present study are strictly correlational, and thus one cannot infer causality from the observed relationships. Clearly, more controlled studies that utilize experimental designs are needed to determine if these preliminary design suggestions are capable

of positively influencing military students' satisfaction and, ultimately, their academic performance in self-paced, online situations.

Another significant limitation of the present investigation was the use of satisfaction as the sole outcome measure. Although several authors have lauded the importance of student satisfaction as a relevant outcome in online settings (see, for example, Chyung, 2001, Moore & Kearsley, 2005; Simonson et al., 2003), it is apparent that future work must include more direct, performance outcomes in order to truly understand how components of social cognitive self-regulation might positively influence student success with online training. This recommendation is particularly salient if one considers Moore and Kearsley's (2005) warning that when analyzing the results of student satisfaction surveys, "there is typically no relationship between these attitudes and actual achievement" (p. 176).

A third limitation of this study was the application of a self-report instrument to measure the various constructs from social cognitive theory. Like any survey, the instrument used has reliability and validity limitations. In particular, social desirability bias and response sets are considered significant threats to the construct validity of any self-report instrument (Thorndike, 2005). Additionally, construct validity can be threatened when all of the variables are measured using the same method (i.e., mono-method bias; Shadish, Cook, & Campbell, 2002). Future research that includes more direct, behavioral measures would help clarify how students' motivational beliefs and attitudes impact their actual academic performance in self-paced, online courses.

Despite these limitations, results from the present study provide some insight into the relationship between motivational beliefs, perceptions of instructional quality, and overall satisfaction. Consistent with social cognitive models of self-regulation, findings support the view

that students' satisfaction with an online course can be explained, in part, by their motivational beliefs and attitudes toward the learning task. These findings suggest that online course developers might benefit by creating their instruction using quality design elements that help learners not only appreciate the value or importance of content or skills but also support and scaffold their attempts to master them.

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Tables

Table 1

Descriptive Statistics, Cronbach's Alphas, and Pearson Correlations for the Measured Variables

Variable	*N*	*M*	*SD*	α	1	2	3	4	5	6	7	8
1. Satisfaction	640	4.24	1.24	.88	–	.05	-.03	.18**	.25**	.56**	.47**	.65**
2. Gender	624	–	–	–		–	-.08	-.03	.01	.07	.01	.06
3. Age	625	20.44	.99	–			–	-.03	.08	.07	.00	.00
4. Online Tech. Exp.	625	5.80	1.13	–				–	.44**	.14*	.32**	.17**
5. Online Learning Exp.	624	4.61	1.29	–					–	.14*	.27**	.19**
6. Task Value	640	5.39	.92	.89						–	.28**	.50**
7. Self-Efficacy	636	5.22	1.01	.89							–	.47**
8. Instr. Quality	640	5.29	.97	.87								–

Note. *p < .01, **p < .001. Gender was dummy coded (male = 0; female = 1).

Table 2

Model Summaries for the Hierarchical Regression Analysis Predicting Overall Satisfaction with the Self-Paced, Online Course

Measure	Step 1			Step 2			Step 3		
	b	*SE b*	β	*b*	*SE b*	β	*b*	*SE b*	β
Step 1: Demography & Experience									
Gender	.14	.13	.04	.01	.10	.00	-.03	.09	-.01
Age	-.04	-.05	-.03	-.08	.04	-.07*	-.07	.03	-.05
Online Tech. Experience	.10	.05	.09*	-.05	.04	-.05	-.05	.04	-.05
Online Learning Experience	.20	.04	.21**	.12	.03	.13**	.11	.03	.11**
Step 2: Motivational Beliefs									
Task Value				.63	.04	.47**	.41	.04	.31**
Self-Efficacy				.40	.04	.32**	.23	.04	.19**
Step 3: Instructional Quality									
Instructional Quality							.52	.04	.40**
Model Summary Statistics									
Adjusted R^2	.062			.434			.538		
F-value for model	11.256**			79.966**			103.769**		
df for model	4, 614			6, 612			7, 611		
R^2 change for step	–			.371			.104		
F-value for step	–			202.603**			138.664**		

Note *$p < .05$, **$p < .001$. *b* = unstandardized regression coefficient; *SE b* = standard error of *b*; β = standardized regression coefficient. Gender was dummy coded (male = 0; female = 1).