Academic motivation and self-regulation: A comparative analysis of undergraduate and graduate students learning online

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A B S T R A C T

To succeed in autonomous online learning environments, it helps to be a highly motivated, self-regulated learner. The present study explored potential differences between undergraduate ($n = 87$) and graduate students ($n = 107$) in their levels of academic motivation and self-regulation while learning online. In particular, this study provides a comparative analysis of undergraduate and graduate students' motivational beliefs (task value and self-efficacy), use of deep processing strategies (elaboration and critical thinking), and motivational engagement (procrastination and choice behaviors). As hypothesized, graduate students learning online reported higher levels of critical thinking than undergraduates. Moreover, after controlling for experiential differences, a logistic regression analysis indicated that graduate student membership was predicted by higher levels of critical thinking and lower levels of procrastination. On the other hand, undergraduate membership was predicted, somewhat paradoxically, by greater task value beliefs and greater intentions to enroll in future online courses. Implications for online instructors and suggestions for future research are discussed.

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1. Introduction

Online learning has become an accepted, even expected part of higher education (Larreamendy-Joerns & Leinhardt, 2006; Moore & Kearsley, 2005; Tallent-Runnels et al., 2006). Evidence of the explosive growth in online learning and its firm establishment is abundant. For instance, the most recent Sloan Consortium (Allen & Seaman, 2008) survey revealed that online enrollments rose by more than 12% from 2006 to 2007. The survey of more than 2500 colleges and universities nationwide reported that 3.94 million students (or approximately 22% of the overall higher education student body surveyed) were enrolled in at least one online course in the fall of 2007. Furthermore, the 12% growth rate for online enrollments far exceeds that of the overall higher education population (1% growth). All told, the number of students learning online has more than doubled in the five years since the Sloan Consortium first conducted their extensive survey of postsecondary institutions (Allen & Seaman, 2008). Clearly, online learning has undergone massive expansion in the last five years, and many experts anticipate that online enrollments will continue to outpace traditional enrollments for the foreseeable future (Allen & Seaman, 2008; Larreamendy-Joerns & Leinhardt, 2006).

As online enrollments have grown, so too has scholarly interest in students' academic motivation and self-regulation in online courses (Dabbagh & Kitsantas, 2004; Green & Azevedo, 2007). Academic motivation has been operationalized in numerous ways from a wide variety of theoretical perspectives (for an overview, see Graham & Weiner, 1996), but generally academic motivation refers to students' *movement* toward and engagement in learning activities. Motivated learners are characterized by low latency and high perseverance with respect to task engagement; that is, they move quickly at the opportunity to learn and stick with it, even in the face of difficulty. Self-regulated learners are characterized as committed participants who efficiently control their own learning experiences in many different ways, including organizing and rehearsing information to be learned; monitoring their thinking processes and seeking help when they do not understand; and holding positive motivational beliefs about their capabilities and the value of learning (Boekaerts, Pintrich, & Zeidner, 2000; Schunk & Zimmerman, 1998). Self-regulated learning has also been described as an active, constructive process whereby students set goals for their learning based on past experiences and the contextual features of the current environment (Pintrich, 2000). These learning goals then become the standards against which academic progress is compared (Green & Azevedo, 2007).

With the explosion of online learning, practitioners and researchers alike have come to understand that to be successful in online courses, it helps to be a highly motivated, self-regulated learner (Azevedo, 2005; Dabbagh & Bannan-Ritland, 2005; Dabbagh & Kitsantas, 2004). The need for high levels of academic motivation and self-regulation is due,

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in part, to the relatively autonomous nature of online learning environments compared to traditional classroom contexts. As Dabbagh and Kitsantas (2004) have argued, "in a web-based learning environment, students must exercise a high degree of self-regulatory competence to accomplish their learning goals" (p. 40); whereas in a traditional classroom, the instructor tends to exercise considerable control over the learning activities. What is more, several educational psychologists (e.g., Green & Azevedo, 2007; Pintrich, 2003; Schunk, Pintrich, & Meece, 2008) have indicated that there may be important developmental differences in students' self-regulation, differences that warrant further empirical investigation. For example, Green and Azevedo (2007) have encouraged researchers to ask whether there might be a developmental progression within self-regulated learning. In their words, "research in this area would perhaps not only allow us to more clearly examine individual phenomena in SRL [self-regulated learning] but also provide clues as to how good SRL behaviors might be taught" (Green & Azevedo, 2007, p. 364). Such developmental differences, if they do exist, could have important educational implications for instructors, determining, for example, the cognitive demands of learning activities faculty design, as well as the type and level of scaffolding teachers provide during instruction.

2. Purpose of the study

The present study explored potential developmental differences in self-regulated learning, as described above. In particular, this study examined whether there were motivational and self-regulatory differences between undergraduate and graduate students enrolled in several online courses. Beginning with the latter, we hypothesized that graduate students would exhibit more adaptive self-regulated learning profiles (i.e., greater use of elaboration and critical thinking strategies and less procrastination) than their undergraduate counterparts. This hypothesis is rooted in the purported developmental nature of self-regulation, as well as the notion that graduate students have greater experience as learners at the university level. As such, we expected graduate students to be more intrinsically motivated to learn (having *chosen* to pursue an advanced degree; Schunk et al., 2008). For the latter two reasons (more university experience and greater intrinsic motivation), we also expected graduate students to report significantly higher levels of academic motivation (i.e., greater task value and self-efficacy beliefs, as well as greater continuing motivation to enroll in future online courses). Ultimately, identifying such differences could help faculty as they attempt to employ effective online teaching strategies for students who may have varying levels of academic motivation and diverse self-regulatory capacities.

3. Method

3.1. Participants

Participants for this study included a convenience sample of 194 students from a large public university in the northeastern United States. Of these students, 87 (45%) were undergraduates and 107 were graduate students. Participants were enrolled in several different courses in the departments of educational psychology and information sciences; all courses were delivered completely online through WebCT. The sample included 95 women (49%) and 99 men. Within the undergraduate sample, there were 33 women (38%) and 54 men; whereas the graduate sample included 62 women (58%) and 45 men. The mean age of the undergraduate participants was 29.1 years ($SD = 9.1$, range 19–47), and the mean age of the graduate students was 34.6 years ($SD = 9.8$, range 21–59). As suggested by the rather high mean age of the undergraduate sample, the distribution was not normal but rather was bi-modal. Specifically, 39 students (45%) in this sample were so-called "traditional" undergraduates (ages 18–24); whereas 46 students (53%) identified themselves as working adults (ages 25–47). These "non-traditional" undergraduates were enrolled in online courses through the school of continuing studies.

In terms of experience with online learning, 71 undergraduates (82% of the undergraduate sample) reported that they had completed one or more online courses in the past; whereas only 60 graduate students (56% of the graduate sample) reported the same level of experience with online learning. This variable and students' personal ratings of their experience with online technologies (ranging from 1 = *extremely inexperienced* to 7 = *extremely experienced*) were used as descriptive and control variables (see Tables 1 and 2, respectively).

3.2. Procedures and instrumentation

During the last three weeks of the semester, participants completed an anonymous, online survey. The first part of the survey was composed of 32 items; all items employed a 7-point Likert-type response scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). The items in this section were further subdivided into six subscales that were adapted from previously published instruments. All previous instrument-validation studies employed a variety of data analytic techniques to investigate validity and reliability evidence for the subscales, including exploratory factor analysis, confirmatory factor analysis, and reliability analysis. Finally, the variables used in this study were created by computing means of the items associated with a particular subscale (see the Appendix for a list of the items in each subscale).

Table 1
Means (standard deviations) and independent-sample t and Cohen's d statistics for the eight variables.

Variable	Group				
	Overall ($N = 194$)	Undergraduate ($n = 87$)	Graduate ($n = 107$)	t-statistic	Cohen's d
Experience					
Online tech. experience	5.82 (1.39)	6.31 (1.30)	5.43 (1.33)	−4.63*	−0.67
No. of completed online courses	3.53 (3.45)	4.87 (4.19)	2.44 (2.16)	−4.91**	−0.79
Motivational beliefs					
Task value	5.72 (1.22)	5.83 (1.31)	5.63 (1.15)	−1.11	−0.16
Self-efficacy	5.70 (1.03)	5.59 (1.07)	5.79 (1.00)	1.39	0.19
Deep processing strategies					
Elaboration	5.28 (1.12)	5.04 (1.30)	5.47 (0.92)	2.60	0.39
Critical thinking	5.10 (1.28)	4.70 (1.39)	5.43 (1.08)	4.08*	0.60
Motivational engagement					
Procrastination	3.02 (1.59)	3.25 (1.73)	2.83 (1.45)	−1.80	−0.27
Choice (continuing motivation)	4.88 (1.68)	5.40 (1.59)	4.45 (1.63)	−4.06*	−0.59

Note. Bonferroni adjustment was used to control for inflation of type I error associated with multiple comparisons: $\alpha = .05/8 = .006$. Cohen's $d = (M_2 - M_1) / \sqrt{[(\sigma_1^2 + \sigma_2^2)/2]}$. The online technologies variable was measured on a 7-point Likert-type response scale ranging from 1 (*extremely inexperienced*) to 7 (*extremely experienced*). The number of completed online courses ranged from 0 to 17. The remaining variables were measured on a 7-point, Likert-type agreement scale.

* $p < .006$.
** $p < .001$.