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# Using Achievement Goal Theory to Predict Adaptive Outcomes in University Students Learning Online

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## Abstract

Effective self-regulation may be particularly important for students participating in online education. The objective of this study was to investigate the relations between learners' motivational beliefs and self-regulation in online courses. University students ($n$ = 107) completed a survey that assessed their achievement goal orientations; academic self-efficacy; and a collection of outcomes that included their use of three learning strategies, academic effort, persistence, and procrastination. Results indicate that mastery orientation and self-efficacy were positively related to adaptive outcomes, including students' use of self-regulated learning strategies and their motivational engagement. Overall, findings support prior research in traditional classrooms indicating that mastery goals and self-efficacy are powerful predictors of self-regulation and other adaptive behaviors. Educational implications and suggestions for future research are discussed.

# Using Achievement Goal Theory to Predict Adaptive Outcomes in University Students Learning Online

With the rapid expansion of Internet-based technologies, online education has emerged as a viable alternative to traditional classroom instruction (Bernard et al., 2004; Moore, 2003; 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 countless institutions of higher education eager to provide students with the opportunity and convenience of learning from a distance (Moore & Kearsley, 2005). For example, 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; 58% of schools identified online education as a critical long-term strategy; and overall online enrollment increased from 2.4 million in 2004 to 3.2 million in 2005.

The recent growth in online learning has resulted in a major shift in education from an instructor-centered to a learner-centered focus (Dillon & Greene, 2003). With this shift has come the suggestion that, in the absence of an ever-present instructor, students learning at a distance must take greater responsibility for the management and control of their own learning (Hartley & Bendixen, 2001; Moore & Kearsley, 2005). Furthermore, a number of 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 in these highly autonomous learning environments (Bandura, 1997; Dabbagh & Kitsantas, 2004; Hill & Hannafin, 1997; Schunk & Zimmerman, 1998).

Academic self-regulation has been studied in traditional classrooms as a means of understanding how successful students adapt their cognition, motivation, and behavior to improve learning. 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).

Using achievement goal theory as a framework, research in traditional classrooms has consistently found that students who adopt mastery goals demonstrate greater use of cognitive and metacognitive learning strategies than those who are focused on demonstrating ability and/or avoiding the perception of incompetence (Pintrich, 1999, 2000; Pintrich & Garcia, 1991; Wolters, 2004). Moreover, investigators have found moderate to strong positive relations between students' use of SRL strategies and, ultimately, their academic achievement (Pintrich, 1999; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991; Pintrich, Smith, Garcia, & McKeachie, 1993). For example, in a survey study of 356 college undergraduates learning in traditional classrooms, Pintrich et al. (1993) found that adaptive motivational beliefs (e.g., mastery goals and high self-efficacy) were positively correlated with students' self-reported use of deep processing strategies and their academic performance, as measured by final course grade.

## Purpose of the Study

The purpose of the present study was to explore the linkages between students' achievement goal orientations and self-regulation in online courses, seeking to determine if the pattern of relationships are consistent with those that have been found in traditional academic settings. The following research questions were addressed: (1) Are students' achievement goal

orientations and academic self-efficacy associated with their use of SRL strategies in online courses?; and (2) Are students' achievement goal orientations and academic self-efficacy related to their level of academic effort, persistence, and procrastination within those online courses? It was hypothesized that mastery goals and self-efficacy would be positively associated with adaptive academic outcomes.

## Method

### *Participants*

Participants for this study included a convenience sample of 46 graduate (43.0%) and 61 undergraduate (57.0%) students from a large public university in the northeastern United States. Participants were enrolled in several different courses delivered completely online through WebCT. The sample included 52 women (48.6%) and 55 men (51.4%), with a mean age of 29.9 years (SD = 9.10; range 19-56).

### *Measures and Procedures*

During the last four weeks of the semester, participants completed an anonymous, online survey. The three-part survey was composed of 66 items with a Likert-type response scale ranging from 1 (*not at all true of me*) to 7 (*very true of me*). Items in section one of the survey addressed students' achievement goals and were adapted from the Patterns of Adaptive Learning Survey (PALS; Midgley et al., 1998). Additionally, section one included items that tapped into students' self-efficacy for learning and performance and were adapted from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1993). Items in section two addressed students' use of SRL strategies and were also adapted from the MSLQ. Finally, items in section three addressed students' motivational engagement, including academic effort, persistence, and procrastination, and were adapted from Wolters (2004). The items used in the

present study were similar to the original questionnaires, except that some items were re-worded to reflect the online nature of the course.

The four subscales used as predictors included the following:

(1) 5-item *mastery orientation* scale – students' emphasis on wanting to learn as mush as possible and a preference for work that is challenging (α = .91);

(2) 5-item *performance-approach orientation* scale – students' focus on demonstrating high ability compared with others in their online class (α = .85);

(3) 2-item *performance-avoidance orientation* scale – students' emphasis on not wanting to look incompetent in their online class (α = .72);[1] and

(4) 7-item *self-efficacy for learning and performance* scale – students' perceptions of expectancy for success and confidence in their ability to perform (α = .91).

The six subscales used as dependent variables included the following:

*Learning Strategies:*

(1) 5-item *elaboration* scale – students' use of elaboration strategies (e.g., paraphrasing, summarizing; α = .87);

(2) 5-item *critical thinking* scale – students' use of critical thinking strategies (e.g., applying previous knowledge to new situations or making critical evaluations of ideas; α = .87);

(3) 10-item *metacognitive self-regulation* scale – students' use of metacognitive control strategies (e.g., planning, setting goals, monitoring one's comprehension, and regulating performance; α = .88);

[1] The original performance-avoidance orientation scale, developed by Midgley et al. (1998), included six items. Due to an error during the creation of the survey used in the present study, only two items were included in this scale.

*Motivational Engagement:*

(4) 3-item *effort* scale – students' belief that they work hard to complete tasks in their current online course (α = .76);

(5) 4-item *persistence* scale – students' belief that they complete work in their online course even when faced with distractions and difficultly (α = .74); and

(6) 5-item *procrastination* scale – students' level of academic disengagement or tendency to put off getting started on the work required in their online course (α = .91).

## Results

*Correlational Analyses: Learning Strategies Use*

Pearson correlations, presented in Table 1, indicate that mastery orientation and self-efficacy were significantly positively related to each other ($r = .70$, $p < .01$) and to students' use of cognitive and metacognitive learning strategies. As expected, mastery orientation was positively related to students' use of cognitive strategies, such as elaboration ($r = .67$, $p < .01$) and critical thinking ($r = .60$, $p < .01$), and metacognitive strategies ($r = .65$, $p < .01$). Likewise, students' self-efficacy was positively related to their use of elaboration ($r = .61$, $p < .01$), critical thinking ($r = .66$, $p < .01$), and metacognitive strategies ($r = .54$, $p < .01$). On the other hand, performance-approach and performance-avoidance goals were unrelated to students' reported use of these three learning strategies. Overall, these results indicate that when considered individually, the motivational variables of mastery orientation and self-efficacy explained from 29% to 45% of the variance in students' use of cognitive and metacognitive learning strategies.

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Insert Table 1 Here

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*Correlational Analyses: Motivational Engagement*

The correlational results in Table 1 indicate that mastery orientation was significantly positively related to both effort ($r = .32$, $p < .01$) and persistence ($r = .35$, $p < .01$), and negatively related to procrastination ($r = -.29$, $p < .01$). Self-efficacy, on the other hand, was only significantly positively related to persistence ($r = .25$, $p < .05$), and performance-approach orientation was only significantly positively related to procrastination ($r = .23$, $p < .05$). Performance-avoidance orientation was unrelated to all the motivational engagement variables.

*Regression Analyses: Predicting Learning Strategies Use*

A multivariate regression was conducted to determine if the set of independent variables could be used to predict the three learning strategies variables (Stevens, 2002). Results indicate a statistically significant relationship between the four predictors and the dependent variables of elaboration, critical thinking, and metacognitive self-regulation (Wilks' $\Lambda = .38$, $F = 9.66$, $p < .001$). Furthermore, univariate *F*-tests indicate that elaboration, critical thinking, and metacognitive self-regulation were all significantly related to the set of predictors.

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Insert Table 2 Here
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Table 2 presents a summary of the regression analyses for each of the learning strategies variables. As indicated, the four predictors accounted for approximately 49% of the variance in students' self-reported use of elaboration strategies ($F = 24.50$, $p < .001$). After controlling for the other variables, only mastery orientation and self-efficacy were significant positive predictors of elaboration ($\beta = .47$ and .29, respectively). Similarly, results from the second analysis indicate that the four predictors accounted for approximately 47% of the variance in students' self-reported use of critical thinking strategies ($F = 23.02$, $p < .001$). In this case, however, self-

efficacy was the strongest individual predictor of critical thinking ($\beta = .49$, $p < .001$); mastery orientation was also a significant individual predictor of critical thinking ($\beta = .26$, $p < .05$). Finally, results from the third analysis indicate that the four predictors accounted for approximately 45% of the variance in students' self-reported use of metacognitive self-regulation strategies ($F = 20.66$, $p < .001$). However, mastery orientation was the only statistically significant individual predictor of metacognitive self-regulation ($\beta = .54$, $p < .001$).

*Regression Analyses: Predicting Motivational Engagement*

Similar to the first set of regression analyses, a second multivariate regression was conducted to determine if the set of independent variables could be used to predict the three motivational engagement variables (Stevens, 2002). Results indicate a statistically significant relationship between the four predictors and the dependent variables of academic effort, persistence, and procrastination (Wilks' $\Lambda = .69$, $F = 3.30$, $p < .001$). Furthermore, univariate $F$-tests indicate that effort, persistence, and procrastination were all significantly related to the set of predictors.

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Insert Table 3 Here
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Table 3 presents a summary of the regression analyses for each of the motivational engagement variables. As indicated, the four predictors accounted for approximately 12% of the variance in students' self-reported level of academic effort ($F = 3.48$, $p < .05$). After controlling for the other predictors, only mastery orientation was a significant positive predictor of effort ($\beta = .36$, $p < .01$). Similarly, results from the second analysis indicate that the four predictors accounted for approximately 16% of the variance in students' self-reported level of persistence ($F = 5.00$, $p < .01$). Again, mastery orientation was the only significant individual predictor of

persistence ($\beta = .35$, $p < .01$). Finally, results from the third analysis indicate that the four predictors accounted for approximately 18% of the variance in students' reported level of procrastination ($F = 5.60$, $p < .001$). In this case, after controlling for the other variables, mastery orientation was a significant *negative* predictor of procrastination ($\beta = -.47$, $p < .001$), whereas performance-approach orientation was a significant positive predictor of procrastination ($\beta = .21$, $p < .05$).

## Educational Implications and Future Directions

Despite methodological limitations, results from the present study provide insight into the relationships between motivational components and self-regulation. Consistent with achievement goal theory (Pintrich, 1999, 2000; Wolters, 2004), the current findings support the view that students' use of learning strategies and their motivational engagement in online courses can be explained, in part, by their achievement goal orientations and academic self-efficacy in these highly autonomous instructional environments. Specifically, as hypothesized, mastery orientation and self-efficacy were related to adaptive outcomes, whereas performance-approach and performance-avoidance orientations were not.

These results suggest that faculty of online courses should consider students' motivational characteristics when designing instructional activities. For example, it is possible that online learners' mastery goals and academic efficacy could be bolstered by including activities that not only emphasize student learning and effort, but also support and scaffold students' attempts to master those learning tasks. Although more evidence is needed in the context of online learning, research results from traditional classrooms have suggested that instructional practices *can* help foster the adoption of mastery goals and facilitate adaptive

efficacy beliefs, thereby resulting in more deeply engaged and self-regulating students (Pintrich, 1999; Pintrich & Schunk, 2002; Wolters, 2004).

Future research should continue to explore the relationships between students' motivational characteristics, their use of self-regulated learning strategies and motivational engagement, and, ultimately, their learning gains in online situations. The use of alternative research methods, such as content analysis of online discussion boards, might be especially useful in exploring the relations between students' reported level of self-regulation and the extent to which their online interactions indicate deep processing and knowledge construction (Artino & Stephens, 2006). Additionally, future research should investigate whether online interventions designed to enhance motivational beliefs and scaffold students' use of SRL strategies can also improve academic performance.

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**Table 1**
*Means, Standard Deviations, Cronbach's Alphas, and Pearson Correlations Among the Independent and Dependent Variables*

| Variable | *M* | *SD* | α | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Motivational Beliefs* | | | | | | | | | | | | | |
| 1. Mastery orientation | 5.69 | 1.14 | .91 | – | .10 | .16 | .70** | .67** | .60** | .65** | .32** | .35** | -.29** |
| 2. Performance-approach | 4.19 | 1.38 | .85 | | – | .39** | .19* | .10 | .04 | .18 | -.11 | -.15 | .23* |
| 3. Performance-avoidance | 4.36 | 1.50 | .72 | | | – | .23* | .09 | .13 | .18 | -.01 | -.06 | .13 |
| 4. Self-Efficacy | 5.81 | 1.00 | .91 | | | | – | .61** | .66** | .54** | .19 | .25* | -.06 |
| *Learning Strategies* | | | | | | | | | | | | | |
| 5. Elaboration Strategies | 5.55 | 1.23 | .87 | | | | | – | .82** | .76** | .35** | .24* | -.16 |
| 6. Critical Thinking Strategies | 5.00 | 1.33 | .87 | | | | | | – | .68** | .22* | .13 | -.09 |
| 7. Metacognitive Strategies | 4.72 | 1.16 | .88 | | | | | | | – | .37** | .12 | -.16 |
| *Motivational Engagement* | | | | | | | | | | | | | |
| 8. Effort | 4.94 | 1.44 | .76 | | | | | | | | – | .31** | -.44** |
| 9. Persistence | 5.28 | 1.31 | .74 | | | | | | | | | – | -.77** |
| 10. Procrastination | 3.16 | 1.68 | .91 | | | | | | | | | | – |

*Note.* $N = 107$. $^{*}p < .05$. $^{**}p < .01$.

**Table 2**
*Summary of Regression Analyses Predicting Students' Use of Self-Regulated Learning Strategies*

| Variable | Elaboration Strategies | | | Critical Thinking Strategies | | | Metacognitive Self-Regulation | | |
|---|---|---|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Mastery Orientation | .51 | .11 | .47*** | .30 | .12 | .26* | .55 | .10 | .54*** |
| Performance-Approach | .02 | .07 | .02 | -.08 | .08 | -.08 | .08 | .07 | .09 |
| Performance-Avoidance | -.05 | .06 | -.06 | .07 | .07 | .01 | .02 | .06 | .03 |
| Self-Efficacy | .36 | .13 | .29** | .65 | .14 | .49*** | .16 | .12 | .13 |
| Model Summary | $R^2$ = .49, $p$ < .001 | | | $R^2$ = .47, $p$ < .001 | | | $R^2$ = .45, $p$ < .001 | | |

*Note.* $N$ = 107. *$p$ < .05. **$p$ < .01. ***$p$ < .001

**Table 3**
*Summary of Regression Analyses Predicting Students' Motivational Engagement*

| Variable | Effort | | | Persistence | | | Procrastination | | |
|---|---|---|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Mastery Orientation | .45 | .16 | .36** | .40 | .15 | .35** | -.69 | .19 | -.47*** |
| Performance-Approach | -.14 | .11 | -.14 | -.16 | .09 | -.17 | .26 | .12 | .21* |
| Performance-Avoidance | -.00 | .10 | -.00 | -.05 | .09 | -.06 | .08 | .11 | .07 |
| Self-Efficacy | -.05 | .19 | -.04 | .06 | .17 | .05 | .36 | .22 | .21 |
| Model Summary | $R^2$ = .12, $p$ < .05 | | | $R^2$ = .16, $p$ < .01 | | | $R^2$ = .18, $p$ < .001 | | |

*Note.* $N$ = 107. *$p$ < .05. **$p$ < .01. ***$p$ < .001