THE RELATIONSHIP BETWEEN GOAL ORIENTATION AND SIMULATION PERFORMANCE WITH ATTITUDE CHANGE AND PERCEIVED LEARNING

Philip H. Anderson
University of St. Thomas
phanderson@stthomas.edu

Leigh Lawton
University of St. Thomas
l9lawton@stthomas.edu

ABSTRACT

This study explored the relationship between the students' goal orientation, their success on a simulation exercise, and their perceptions of its value. This study found the relationships between financial performance on the simulation and student perceptions of its attractiveness as an educational pedagogy were not significantly moderated by the goal orientation of the student. Limitations and directions for future research are explored.

INTRODUCTION

Users of business simulations often cite anecdotal evidence that financial success in the exercise influences student attitudes toward the simulation exercise (see, for example, Anderson and Lawton, 2007; Gentry, Dickinson, Burns, McGinnis, & Park, 2007). This study sought to determine whether, in fact, students' goal orientation has an impact on that relationship. That is, does financial performance on a simulation exercise affect the attitudes toward that exercise differently for students with a performance goal orientation than for students with a learning goal orientation?

LITERATURE REVIEW

GOAL ORIENTATION

Dweck (1990) and other educational and social psychologists have identified different goal orientations related to an individual's implicit theory of ability and task accomplishment (Button, Mathieu, & Zajac, 1996; Dweck & Leggett, 1988; Elliott & Dweck, 1988). Research in this field shows these two goal orientations (learning and performance) have an impact on how one approaches learning. Individuals with a learning goal orientation, also referred to as a mastery goal orientation, seek to increase personal competence by learning new skills. They believe their competencies can be developed and improved. This is in contrast to individuals with a performance goal orientation whose focus is to demonstrate proficiency and receive positive evaluations from others. They believe that ability is static and unchangeable (Bell & Kozlowski, 2002, Dweck, 1990).

Researchers have shown that these goal orientations are independent constructs. This allows an individual to possess both the performance goal and learning goal orientation simultaneously (Button, et al., 1996). This independence also applies to the work-avoidance orientation when it is treated as a separate goal orientation (Roebken, 2007; VandeWalle (1997).

ACHIEVEMENT AND GOAL ORIENTATIONS

Questions regarding the effect of goal orientation on motivation in an academic environment have resulted in considerable research (Archer, 1994; Barron & Harackiewicz, 2003; Bouffard, Vezeau, & Bordeleau, 1998; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002a; Roebken, 2007). Dweck & Leggett (1988) argue that students' achievement goals play an important role in shaping academic interest and can influence how a student approaches coursework. Students pursuing a mastery goal seek to acquire new knowledge and skills (Dweck, 1990). This contrasts with students pursuing a performance goal where the focus is on demonstrating competence relative to their peers (Diener and Dweck, 1978, 1980).

Mixed results have been reported for how these goal orientations relate to attitude toward an activity (e.g. a course) and consequent motivation in academic settings. For example, Harackiewicz, Barron, Carter, Lehto, & Elliot (1997) report that mastery goals *predicted* interest in a class, but later Harackiewicz, Barron, Tauer, Carter, & Elliot (2002b) found that students with an initial interest in a course may be more oriented toward *adopting* mastery goals in an effort to learn more about the discipline. Since there was no attempt to examine causality, it may be that students with mastery goals are more likely to develop an interest in a course where the potential for learning is high (Harackiewicz et al., under review, Journal of Educational Psychology). In fact, Elliot and Church (1997) found that when mastery is assessed early in a course, there was higher interest later. Adding to these mixed results, Bouffard, Boisvert, Vezeau, & Larouche (1995) found no support for a relationship between mastery goals and attitudes toward a course.

While research demonstrates that students pursue multiple goals in their classes (Pintrich, 2000), it is unclear how the goals affect performance. While we know that students can pursue simultaneously both learning (mastery) goals and performance goals, research has not resolved the issue of which orientation will dominate or what the outcome will be if the person is both performance and learning oriented. However, Roebken (2007) recently reported that both mastery and performance approach

goals are needed to facilitate satisfaction and academic achievement.

ACHIEVEMENT GOAL ORIENTATIONS AND BUSINESS SIMULATIONS

Dweck (1990) argues that performance-oriented individuals are more threatened by situations that are challenging and ill-defined than are those who are learning-oriented. Business simulations, by virtue of their fluid nature, place students in situations that challenge their ability to succeed (Gentry & Burns 1997). Given the complexity of most simulations, instructors typically do not expect students to possess the knowledge, skills, or experience needed to achieve successful outcomes in the early decision rounds of the game. The assumption is that students will learn the keys to success over time, hence the use of multiple decision rounds spread across a quarter or semester (Anderson & Lawton, 1997).

Gentry, Dickinson, Burns, McGinnis, and Park (2006, 2007) contend that initial poor performance translates into students experiencing negative outcomes as they work to understand the complexities of the exercise. They question whether performance-oriented students will be able to manage as well as learning-oriented students, the almost inevitable negative feedback that comes with game participation. That is, Gentry et al., speculate that performance-oriented students will be handicapped by their preoccupation with performance and as a result, will be less able to respond to changing conditions. They may assume a defensive position rather than adopting a broader focus on the learning opportunities that the simulation presents.

Earlier, similar concerns led Gentry and Burns (1997) to recommend "guided learning" to help students manage their experiences over the duration of a simulation exercise. They argued that students need active assistance from the course instructor to manage their expectations and help them focus on the results of a particular decision round as opposed to the simulation exercise as a whole.

FINANCIAL PERFORMANCE, ATTITUDES AND BUSINESS SIMULATIONS

Seijts, Latham, Tasa, & Latham (2004) studied three groups of students given three different goal outcomes in a complex simulation exercise. The three groups undertook the same simulation and were evaluated in terms of achieving one of either: a performance goal outcome, a vague "do your best" goal outcome or a learning goal outcome. They found that students who were asked to accomplish a learning goal outcome significantly outperformed the performance and vague goal outcome groups. Seijts et al (2004) also report that the performance goal group did not significantly outperform the vague goal group. They characterized this finding as "astonishing" because it was counter to most of the prior research on goal setting and motivation which states "that people who work toward specific, difficult goals outperform those instructed to do their best" (Seijts et al 2004, p. 235).

Anderson and Lawton (2006, 2007) reported no support for a relationship between financial performance on the simulation exercise and students' attitudes toward the simulation. Nor did they find support for a relationship between a student's performance and his or her perception of how much was learned from participating in the simulation. While the correlation coefficients were positive, as predicted, they were very small and none was statistically significant. The authors noted that anecdotal evidence seems to suggest that students achieving financial success on a simulation often express more positive opinions of the value of the simulation than do those experiencing weaker financial performance. Anderson and Lawton questioned whether there might be some unmeasured variable that would explain which students respond most favorably to simulations.

Simultaneous with Anderson and Lawton's studies, Gentry, et.al. (2006 and 2007) presented evidence that learning-oriented students respond better to negative results on a simulation exercise than do students with a performance goal orientation. While they acknowledged complications with sample size and the instrument used to assess goal orientations, their results suggested that the impact of students' goal orientation might be an important consideration as instructors attempt to manage the simulation and assess students' engagement in the exercise. Their research suggests that goal orientation of students may be the unmeasured variable sought by Anderson and Lawton.

PURPOSE OF THE STUDY

The purpose of this study was to explore the relationship between: 1) performance on a simulation exercise; 2) a student's goal orientation; and 3) students' attitudes toward the exercise. As noted above, students can be simultaneously both performance-oriented and learning-oriented (Pintrich, 2000). Our hypotheses for this study, therefore, did not posit the results for performance goal oriented versus learning goal oriented students. Rather, they assessed the results for each goal orientation independently.

The hypotheses for this study were:

H1: For students with a high Performance Goal orientation there will be a positive correlation between performance on the simulation and changes in students' attitudes toward the simulation experience.

H2: For students with a high Learning Goal orientation there will be little or no correlation between performance on the simulation and changes in students' attitudes toward the simulation experience.

H3: For students with a high Performance Goal orientation there will be a positive correlation between performance on the simulation and changes in students' perception of how much they learned from the simulation experience.

H4: For students with a high Learning Goal orientation there will be little or no correlation between performance on the simulation and changes in students' perception of how much they learned from the simulation experience.

RESEARCH METHODOLOGY

THE SUBJECTS OF THE STUDY

Subjects for the study were drawn from students enrolled in two course sections of a required senior-level-strategy course for business majors at a medium-sized, private university Midwestern university. Both sections were taught by the same instructor using a combination of lecture, case discussion, and the simulation exercise. The majority of the students were traditional, college-aged students. A total of 44 of the 46

students enrolled in the two course sections completed all parts of the study yielding an overall 96% usable response rate.

THE SIMULATION

The simulation used in the study was *Threshold Competitor* (Anderson, Beveridge, and Scott, 2007). It is a total enterprise, business strategy simulation that requires students to make approximately 35 decisions. The decisions involve elements of the marketing mix (e.g., price, quality, promotion), marketing research, (e.g., purchase of price information, future sales potential), operations (staffing and training of workforce, construction of plant, production of goods) and finance (borrow short-term and long-term funds, manage cash flow) for each period of play. Each decision period represents three-months (i.e., one quarter).

The simulation has a Team version (in which student-managed companies compete against other student-managed companies) and a Solo version (in which one student-managed company competes against computer-managed companies, not other student-managed companies). Only the Team version was used for this research.

STUDY DESIGN

Students were assigned to 12 companies operating in two industries, each industry with six companies and four students per company. The simulation was played for 12 decision rounds. Financial performance on the simulation exercise was weighted at twenty percent of the student's course grade.

ASSESSMENT MEASURES

Four measures were used in this study. They were (1) performance on the simulation, (2) student attitudes toward the simulation, (3) student perceptions of how much they learned from participating in the simulation, and (4) student goal orientation (performance orientation versus learning orientation). The measures for attitude and perception were undertaken before the start of the simulation and just following its completion. The measure for goal orientation was taken at the start of the simulation.

Simulation Performance Measure. The measure used for performance on the simulation was the Game-to-Date total points score (GTD Points) which ranges from a maximum of 100 points to a minimum of -100 points and is generated by the simulation. This score reflects the relative performance of each company *within* an industry based on their performance on factors such as sales revenue, net income, and return on assets. In order to adjust for differences *between* industries, a z-score was calculated for all companies' GTD Points score within each industry (industry-by-industry). This normalized the GTD Points and allowed the aggregation of individual industry data into one pool for assessment.

Student Attitudes Toward the Simulation Measures. Ten items were used to measure student attitudes toward the simulation. We developed four of the items used to measure attitudes. The six semantic differential scales have been used in previous studies (see, for example, Anderson and Lawton, 2006). Factor analysis was conducted and two items were excluded from the scale. The remaining eight items had a high level of internal consistency as measured by Cronbach's alpha. This was true for both times that the students' attitudes were assessed, before and after the simulation exercise. Table 1 shows the items and Cronbach's alphas for the attitude measure. Our dependent variable is the *change* in student perceptions of learning (rather than the absolute value of the attitude scores) since our hypotheses anticipate that the perceptions of performance-oriented students will be colored by their success

Table 1
Student Attitude Scales

Scale Name	Description of Items *	Number of Items	Cronbach's alpha**
Attitude	a. Participating in the simulation was really exciting. * b. I think that participating in the simulation was very worthwhile.* c. I think that what I learned from the simulation was important for me to know.* d. I really enjoyed learning about the simulation.* Six semantic differential scales. *The simulation was…* ▪ unpleasant 1 2 3 4 5 6 7 enjoyable ▪ dreadful 1 2 3 4 5 6 7 engaging ▪ dull 1 2 3 4 5 6 7 stimulating ▪ simplistic 1 2 3 4 5 6 7 challenging Excluded from analysis to improve Cronbach's alpha ▪ frustrating 1 2 3 4 5 6 7 satisfying ▪ overwhelming 1 2 3 4 5 6 7 manageable	8	.911, .938

* The scale for these four items is 1= strongly disagree to 7= strongly agree. (The statements above are for the "after" assessment. The statements used in the "before" assessment were the same except for verb tense used [e.g., "will be" instead of "was"].)

** Note: there are two values of Cronbach's alpha shown above because the questionnaire was administered on two separate occasions – before the simulation began and after its completion.

or failure.

Student Perceptions of Learning Measure. The learning measure was assessed using a single item question. Students indicated their perception of how much they learned from participating in the simulation on a 7-point scale from "Nothing" to "An extreme amount". As with student attitudes toward the simulation, our concern is with the *change* in student perceptions of learning (rather than the absolute value of their perceptions) because our hypotheses involve student *reactions* to the performance they experience in the simulation.

Goal Orientation Measure. The student goal orientation measure was assessed using a 25-item questionnaire. Twenty of the items were taken from Button, Mathieu, and Zajac (1996, p. 33) and five additional items were added by the authors. The instrument was designed to measure the students' goal orientation towards tasks in general, not a specific task. No items were included to measure a Work- Avoidance Goal Orientation. Eleven of the 25 items in the questionnaire were designed to measure Learning Goal Orientation and 14 to measure Performance Goal Orientation.

Factor analysis was conducted to test for internal consistency of the scale items for the two goal orientations. Following the factor analysis, several items were dropped from the list. In the analysis that follows, there were seven items for Learning Goal Orientation and eight items for Performance Goal Orientation. The Cronbach's alphas were .789 for the Learning Goal items and .832 for the Performance Goal items.

RESULTS

GOAL ORIENTATION

Because students can pursue simultaneously both performance goals and learning goals, we assessed the extent to which this occurred in the current study. Student goal orientation results were segmented roughly into thirds for each orientation. Table 2 shows the results of this analysis. Of the 44 students who completed the study, five (11.4%) were in the top one-third for *both* their performance goal orientation and learning goal orientation. This compares with five (11.4%) who were singular in their learning goal orientation (i.e., top one-third in learning goal orientation and bottom one-third in performance goal orientation) and two (4.5%) who were singular in their performance goal orientation (i.e., top one-third in performance goal orientation and bottom one-third in learning goal orientation).

GOAL ORIENTATION AND INITIAL ATTITUDES.

Table 3 shows the relationships between goal orientation and initial attitude toward the simulation exercise for the 44 students. The results show a significant positive relationship between performance goal orientation and attitude toward the simulation before beginning the exercise. However, while significant, little of the difference in initial attitudes is explained by the students' performance goal orientation (Adjusted R-square = 14.1%).

Table 3 also shows the positive relationship between learning goal orientation and initial attitude toward the simulation exercise as significant. However, as with the performance goal orientation, the Adjusted R-square of 13% indicates little of the relationship between these two factors is explained by this

Table 2
Goal Orientation

Performance Oriented	Learning Oriented: Bottom 3rd	Learning Oriented: Middle 3rd	Learning Oriented: Top 3rd	Total
Bottom 3rd	3 (7%)	6 (14%)	5 (11%)	14 (32%)
Middle 3rd	1 (2%)	7 (16%)	13 (30%)	21 (48%)
Top 3rd	2 (4%)	2 (4%)	5 (11%)	9 (20%)
Total	6 (14%)	15 (34%)	23 (52%)	44 (100%)

Table 3
Goal Orientation and *Initial* Attitude

	p-value	Adjusted R-Sq
Performance Goal Oriented	.007	14.1%
Learning Goal Oriented	.009	13.1%

Table 4
Goal Orientation and *Expected* Learning

	p-value	Adjusted R-Sq
Performance Goal Oriented	.019	10.3%
Learning Goal Oriented	.572	0.0%

association.

GOAL ORIENTATION AND EXPECTED LEARNING.

Table 4 shows the relationships between goal orientation and the students' *expectations* for learning by participating in the simulation exercise (n=44). As with the results for initial attitudes shown in Table 3, the results show a significant positive relationship between performance goal orientation and students' *expectations* for learning before beginning the exercise. But again, as with the relationship with initial attitudes, little of the difference in the students' *expectations* for learning is explained by the students' performance goal orientation (Adjusted R-square = 10.3%).

There was a positive relationship between learning goal orientation and students' *expectations* for learning on the simulation exercise, but as Table 4 shows the relationship was not a significant.

GOAL ORIENTATION, SIMULATION PERFORMANCE, AND ATTITUDE CHANGE.

Table 5 shows the results of our analysis to assess the relationship between goal orientation, simulation performance, and attitudes (Hypotheses 1 and 2). We performed this analysis by using the change in student attitudes from the beginning to the end of the simulation exercise. When conducting the analysis for the performance goal and learning goal orientations, we used all of the students who were in the top one-third for that classification. For example, in Table 5, the performance goal oriented sample includes students in the bottom, middle, and top one-third classifications for learning goal oriented, not just those who were in the bottom one-third classification.

Hypothesis 1. To test Hypothesis 1 (changes in the attitudes of students with a high Performance Goal orientation will be positively correlated with performance), we analyzed the attitude change and performance of those who scored in the top one-third on performance goal orientation. There was no statistically significant relationship between performance on the simulation exercise and change in attitude (p = .811). Consequently, there was no support for Hypothesis 1.

Hypothesis 2. To test Hypothesis 2 (there will be little or no relationship between performance and changes in attitudes toward the simulation for students with a high Learning Goal orientation), we analyzed the attitude change and performance of those who scored in the top one-third on learning goal orientation. As with Hypothesis 1, there was no statistically significant relationship between performance on the simulation exercise and change in attitude (p = .514). Consequently, there is support for Hypothesis 2.

Taken together, the study results fail to demonstrate the usefulness of goal orientation to explain changes in student attitudes because neither performance-orientation nor learning-orientation was related to changes in student perceptions.

GOAL ORIENTATION, SIMULATION PERFORMANCE, AND PERCEIVED LEARNING.

Table 6 shows the results of our analysis to assess the relationship between goal orientation, simulation performance, and perceived learning (Hypotheses 3 and 4). We conducted this analysis using the change between how much students expected to learn when they began the simulation exercise and how much they reported that they learned at the end of the exercise. As with the analysis of attitude change, we used all of the students who were in the top one-third for the learning classification when conducting the analysis for the performance goal and learning goal orientations.

Hypothesis 3. To test Hypothesis 3 (the perceived learning of students with a high Performance Goal orientation will be positively correlated with performance), we analyzed the change in perceived learning and performance of those who scored in the top one-third on performance goal orientation. There was no statistically significant relationship between performance on the simulation exercise and change in attitude (p = .418). Consequently, there is no support for Hypothesis 3.

Hypothesis 4. To test Hypothesis (there will be little or no relationship between performance and the perceived learning in the simulation for students with a high Learning Goal orientation), we analyzed the change in perceived learning and performance of those who scored in the top one-third on learning goal orientation. As with the "high" performance goal oriented students, there was no statistically significant relationship

Table 5
Simulation Performance and Attitude Change

	p-value	Adjusted R-Sq
All students	.546	0.0%
Performance Goal Oriented – Top 1/3 (n = 9)	.811	0.0%
Learning Goal Oriented – Top 1/3 (n = 23)	.514	0.0%

Table 6
Simulation Performance and Perceived Learning

	p-value	Adjusted R-Sq
All students	.885	0.0%
Performance Goal Oriented – Top 1/3 (n = 9)	.418	0.0%
Learning Goal Oriented – Top 1/3 (n = 23)	.778	0.0%

between performance on the simulation exercise and change in perceived learning (p = .778). Consequently, there is support for Hypothesis 4. However, as with attitude change (discussed above), these results fail to demonstrate the efficacy of goal orientation for explaining perceived learning since no significant relationship was found for *either* performance-oriented or learning-oriented students.

DISCUSSION

The results from this study provide no support that goal orientation influences the relationship between performance on a business simulation exercise and attitudes toward the exercise. We found no significant relationships between either a Learning Goal Orientation or a Performance Goal Orientation and student simulation performance influencing their attitudes on any of the measures taken.

Likewise, this study's results show no support for a relationship between goal orientation, performance on a business simulation exercise, and perceived learning on the exercise. We found no support that either a Learning Goal Orientation or a Performance Goal Orientation was related to the students' perceptions of learning.

The lack of support for a relationship between performance and attitudes toward the simulation, as well as perception of how much they learned from participating in the simulation, are consistent with the findings of Anderson and Lawton (2006, 2007). But this study went further. It found no support for the hypotheses that the relationship between performance on a simulation exercise and student perceptions of its attractiveness as an educational pedagogy is moderated by their goal orientations. Further, this lack of support for goal orientation influencing this relationship is consistent with that found by Anderson, Lawton and Wellington (2008).

This study found no reason for concern regarding whether a student is performance goal oriented or learning goal oriented. We found no support that a performance goal orientation had a significant effect on the changes in students' response to the simulation exercise in terms of their attitude and perceived learning.

If these findings can be replicated by other teachers using other simulations, as noted in the following Limitations section, then pedagogical designs related to simulation exercises would not have to reflect concern for students' goal orientation. While student's goal orientation may be relevant for other course objectives, it appears that they do not influence those related to simulation exercises.

LIMITATIONS

The principal limitation of the study is that student learning was measured based on student perceptions. Clearly, perceptions do not always equate with reality. However, measures of learning at the higher levels of Bloom's Taxonomy (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956), which is the focus of simulation exercises, has proven particularly elusive (Anderson & Lawton, 1997; Feinstein & Cannon, 2002).

This study's methodology did not attempt to measure other variables that might have acted as enablers or barriers to financial performance on the simulation exercise. Klein, Noe and Wang (2006, p. 671) identify environmental conditions that can facilitate and impede progress on course outcomes. This, in turn, affects motivation to learn which impacts performance. Incorporating other factors, such as those we discuss below, is needed to explain the relationship between financial performance on a simulation exercise and student attitudes and learning.

CONCLUSIONS

This study's results found no support for the belief that students' goal orientation moderates the relationship between performance on a simulation and changes in student perceptions of its attractiveness as an educational pedagogy. This is not what we had expected. Prior research has shown a relationship between goal orientation and academic achievement (e.g., Harackiewicz et al., 2002b; Roebken, 2007). However, that clearly was not the case in this study. There simply was a lack of evidence to suggest that students' goal orientation influenced the students' attitudes and perception of learning regarding the simulation exercise, depending on their financial success.

Based on this research and that done by Anderson, et.al. (2008), factors other than goal orientation play the primary role in determining the relationship between financial success on a simulation exercise and students' attitudes and perception of learning regarding that exercise. Factors that affect motivation to learn include time constraints, learner-instructor relationships, technology concerns, information, and availability of support (Klein, et al., 2006 p. 672). Perhaps these factors play a moderating role in students' perceptions of a simulation exercise.

Another factor to be considered for its impact on this relationship is goal setting. Seijts, et. al. (2004) point out that goal orientation research is focused on ability, while goal setting research is focused on motivation. In this research, and the Anderson, et.al. (2008) research, the goal was predetermined (i.e., weighted rankings of game-to-date financial performance set by the course instructor). However, the company strategy set by the students could yield different financial performance goals. For example, the relative weight given to total sales revenues and return on sales would be different for companies pursuing a "Walmart" strategy versus a "boutique" strategy. Successful implementation of both these strategies would yield different financial success ratings if measured against identical weights for total sales revenues and return on sales. This would argue that the role of goal setting should be included in further research in order to gain deeper insights into the role that students' goal orientations play on their learning. Finally, research in this area also should include assessments of specific measures of student learning set by the course instructor that are not based on student self-perceptions.

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