Motivation and demographics in online learning for graduate students

Giovanni Luke Peralto
College of Computing
Georgia Institute of Technology
Atlanta, GA, USA
gioperalto@gatech.edu

ABSTRACT

UPDATED—April 28, 2019. With motivation considered to be a key theme in regards to the challenges adult distance learners face, understanding this stimulating phenomenon, even a little more, presents tremendous value. As online learning has grown immensely in the last two decades, higher education institutes have experienced an influx of adult learners. This study aims to leverage suitable motivational theories against adult graduate students in online computer science courses. Stemming from a survey on demographics and motivational theories with 83 sets of responses, this quantitative study looks to highlight the influence of motivational theories on adult learners varying by gender, ethnicity, and age. Results showed the female survey participants adhering more to the goal-orientation theory questions while the social cognitive theory questions were answered similarly across all demographic groups. Self-determination theory questions also experienced less optimistic responses with male respondents.

ACM Classification Keywords

A.1 General Literature: Introductory and Survey

Author Keywords

motivation; learning; online; graduate; students; demographics; age; gender; ethnicity

INTRODUCTION

Motivation, the reason or reasons one has for acting a particular way, has always been a thought-provoking phenomenon. As the field of distance learning began to emerge, lower course completion rates also followed with it [7]. This proved to be a challenge with educators, as they weren't directly responsible for the high dropout rates. Bird and Morgan even considered the various ingredients causing the problems of prospective adult distance education learners and among these, they discovered motivation to be a key theme [4]. Yoo and Huang contended that current literature contained little information regarding what online adult learners anticipated from online graduate degree programs in higher education [32]. It has been argued that many models of student attrition have been historically tailored to the on-campus student and that in order to understand the distance learners models needed to put their needs in mind [28]. Additionally, this lack of understanding might have seeded several issues surrounding motivation and engagement leading to an effect on persistence in online learning [13].

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Intrinsic and extrinsic motivation

To properly assess motivation, even in a non-traditional sense, its known background must be explored. We can start with considering that intrinsic motivation, while a key type of motivation, is not the only one of its kind [9]. According to Ryan and Deci, much of what humans do are things that do not fall into the category of being intrinsic in nature [29]. Ergo, one person can influence the motivation of another, resulting in anything form unwillingness to personal commitment, when trying to encourage specific behaviors in that individual. Their self-determination theory claims that these varying motivations reflect the spectrum of different degrees to which one internalizes and integrates a certain value.

Intrinsic motivation speaks to human nature in its desire to discover novelty and rigor [29]. The worthwhile potential of an individual is explored when they seek to improve their own capacities and abilities. Motivation in relation to this phenomenon implies some innate desire to execute a task out of personal curiosity. Extrinsic motivation, on the other hand, concerns performing an activity to obtain an independent outcome [29]. Some examples of this are students who complete homework in order to apply those lessons to their career as well as kids who do the same solely to obey their parents [17],[28]. Both of these instances are voluntary and not driven by an inexplicable innate desire.

Self-regulation

Another term of importance in relation to understanding motivation is self-regulation. Albert Bandura explained the mechanism as including self-efficacy in addition to three key sub-functions [3]. These sub-functions are the self-acknowledgement of one's own behavior, the determinants of that behavior, and its effects. Self-efficacy can be described as a belief system that can impact the choices one makes, as well as their aspirations, the effort they exert on a task, and their perseverance amidst adversity.

Online learning

Online learning has also become an increasingly popular idea with higher-level academia. More research published in 2003 showed that two-thirds of all schools believed online learning was essential to their long-term strategy [1]. A study from Pennsylvania State University showed that generally, a large percentage of students were motivated to choose an online course due to it cohering better with their work schedule [24]. The competing priorities of those juggling work and school have made it difficult for these individuals to enroll in traditional university courses. Online learning has presented a modern solution that offered convenience for the myriad of responsibilities adult learners were burdened with [5].

Oblinger and Hawkins found the growth rate of online learning to be remarkable, with online enrollment increasing faster than traditional student enrollment [22]. With this continuously rising demand in distance education, an understanding of motivators of current and prospective students has become important to both educators and employers. Between the years of 1997 and 2011, higher educational institutes saw over fifty percent growth in adult students from 25 to 34 years old [15]. Several programs, such as the Georgia Institute of Technology's Online Master of Science in Computer Science (OMSCS) program with over six thousand enrolled for the semester of Spring 2018, have also invested deeply into distance education [23].

PURPOSE

The purpose behind this study was to investigate age, ethnicity, and gender, in higher education online learning along with the success of a select few motivational theories applied to the same target audience. Understanding the success of these characteristics and motivational theories individually was of great importance, but the combination of these theories and student attributes was equally significant. The letter grade a student held and the grade they anticipated receiving, considering the course was still in progress at the time the surveys were sent out, were the metrics used to determine the success of these adult learners. Through this work, being able to answer several key questions was the primary objective:

1. To what degree does age, ethnicity, or gender impact success for online graduate students?

2. Which of the included motivational theories are the most successful with this target audience?

3. Does the success of these motivational theories vary by age, ethnicity, or gender?

Statistics from 1997 through 2011 were gathered from public schools to project the education figures of the future [16]. This research also deduced that in this timeframe higher educational institutes saw a 51 percent growth in adult students between the ages of 25 to 34. This led to the belief that the largest age group to reply to the survey in this study would be between the age range of 25 and 31. The majority gender of survey respondents has been female in many of the studies drawn upon, so the results of this study may or may not follow that trend [2],[6],[24],[26].

RELATED WORKS

Factors influencing intrinsic motivation

An article by Pulfrey et al. attempted to explain the impact of grades on intrinsic motivation. They carried out two experiments, each with different age groups and academic tracks [25]. The participants of the first experiment were graded on their ability to solve anagrams in addition to being measured on several intrinsic motivational factors. Meanwhile, the second group, instead of solving anagrams for a letter grade, were measured on many of the same motivational factors as the first group, such as their task-level self-efficacy, baseline performance, choice of anagram length, task performance, task interest, and perceived task autonomy. Regression analyses were carried out on the two experiments, and the results of these showed that perceived task autonomy by itself holds a large influence over continuing task motivation. The grading context seemed to have also influenced task interest.

McCollum and Kajs studied the application of goal-orientation theory to explore the motivation of graduate students [20]. There were 310 participants, each consenting to involvement in a study where these students' mean and standard deviation were recorded on several goal-orientation factors. Results indicated a lack of correlations between these factors, meaning they appeared independent of each other.

Age differences and their impact on the effort required to perform basic cognitive tasks was explored in another study [12]. In this work, younger and older adults were exposed to a memory-search task while their systolic blood pressure was measured. Consistent with expectations, older adults exhibited higher levels of systolic blood pressure when performing the same task as young adults, which, in this case, was indicative of an increase in effort. In addition to the analysis of the correlation of age and cognitive effort, research was also done on intrinsic motivation in relation to cognitive effort. Findings led the authors to conclude that the costs of cognitive activity increased with age and that those costs impacted the willingness of one to allocate resources to more demanding mental activities.

Predictors of persistence, procrastination in online higher education programs

Holder conducted a study to distinguish success in distance learners using hope, academics, environment, and motivation to determine persistence with online college students [16]. His findings regarding motivation implied higher persistence in students that scored higher in his scales regarding emotional support, self-efficacy, and time and study management.

A dissertation by Jamison used Ford's motivational systems theory to predict persistence in a web-based distance education course, which 323 adult community college students enrolled in, with over ninety-three percent accuracy [18].

Other work, by Rakes and Dunn, investigated effort regulation and intrinsic motivation as predictors of procrastination for online graduate students [27]. They found that both effort regulation and intrinsic motivation had an unmistakable influence on procrastination and that as both intrinsic motivations to learn and effort regulation decreased, procrastination rose.

Motivational systems theory and academic performance

Motivational systems theory was used to predict the performance of medical students at a university in Iran [21]. Norouzi et al. determined via their regression analyses, consistent with the expectations using Martin Ford's motivational systems theory, that a responsive environment was the single most influential component to motivate their participants.

Another study was done by Campbell exploring the legitimacy of motivational systems theory to measure the academic performance of college students [6]. Campbell stated that the results provided sufficient empirical evidence to support the argument of motivational systems theory, being that performance or achievement encompasses motivation, skill, and a responsive environment against one's biological structure.

METHODOLOGY

The research conducted by Pulfrey et al. inspired a way to obtain a success measurable for performance in the courses [25]. But instead of polling for student GPA, the current grade and anticipated grade of each student was asked. This was a method by which we could determine a positive outcome for each member.

83 online graduate computer science students from Georgia Institute of Technology, enrolled in an Education Technology course, participated in an online survey that asked questions pertaining to demographics, academics, and each of the three motivational theories that will be mentioned next. Questions regarding demographics included age, gender, and ethnicity. The inquiries surrounding academics discussed an individual's level of education and current or expected grades in the course.

Goal-orientation theory

The first theory explored, by Carol Dweck, was goal-orientation theory, which showed how the specific goals a child pursued shaped their reactions to success or failure [10]. The theory states that with performance goals, the whole task choice and process of its pursuit is shaped around a child's concerns with their ability level. But with learning goals, this process emphasizes progress and mastery through effort. Research provided accounts of adaptive and maladaptive patterns of achievement behavior by characterizing the adaptive, or mastery-oriented, pattern as seeking challenges and persisting amidst adversity. Contrarily, the maladaptive, or helpless, pattern entailed challenge avoidance and a lack of persistence when faced with obstacles.

McCollum and Kajs conducted research on graduate students in an educational leadership preparation program in an attempt to apply the principles of goal-orientation theory to their domain [20]. Findings suggested that older graduate students had a high likelihood of being mastery-approach oriented. This introduced a plausibility of compatibility between goal-orientation theory and adult learners. Concepts of this theory were integrated into the survey (Table 4) at various points.

Social cognitive theory

The second theory, by Albert Bandura, is social cognitive theory, which demonstrated that individuals who worked towards a set of goals, easy or difficult, put in more effort [3]. This started as a set of studies, which then transcended into what became this theory. Bandura found that individuals who created self-set goals tried way harder (reflected in effortful performance). Folks who had set goals that were easier to attain tried about twenty-five percent harder, while those who set more difficult goals achieved approximately forty percent more effortful performance. Moreover, when combining goals with feedback individuals exhibited a shocking sixty percent increase.

Elrich and Russ-Eft applied social cognitive theory to a study in order to explore how the construct could be integrated into academic advising [11]. They created questions, stemmed from the theory, concerning goals and strategic planning. Several questions that were asked in this research provided insights for questions of the survey (Table 5) that asked about career plans, degree goals, and course-specific expectations.

Self-determination theory

The third and final theory introduced in this work is self-determination theory by Richard Ryan and Edward Deci [29]. They found that allowing self-competence and autonomy, defined as supportive conditions that elicit and sustain positive innate propensity, promoted inherent personal growth. Allowing an individual to thrive in an environment also entailed keeping away the factors that detracted from that individual's success, such as alienation. Alienation was defined as the failure of an individual's internalization, which had the potential to be caused by social contexts that thwarted that person's needs for competence, autonomy, and relatedness. Social contexts were found to be largely influential on the success or failure of these results.

A two-year study exploring intrinsic and extrinsic motivation, as well as a lack of motivation, on first-year university students, attempted to answer four research questions concerning academic motivation [19]. These questions were whether academic motivation differed from year-to-year, whether academic motivation changed according to gender, the extent to which external supports, such as scholarships, affected academic motivation, and if academic motivation varied in different departments. The results indicated many things. Academic motivations could change significantly from year-to-year, gender played a role in motivation, scholarships didn't play a noticeable role in academic motivation, and academic motivations certainly differed according to faculties.

Survey questions associated with this theory hovered around the topics of group projects versus individual projects, coupled with asking whether students felt supported in their specific setting. Gender and age were also two of the demographics used in the survey to help correlate motivational factors (Table 6).

Other theories

Several other motivational theories and models exist other than goal-orientation theory, social cognitive theory, and self-determination theory. Bandura's social cognitive theory of self-efficacy actually drew inspiration from both Maslow's hierarchy of needs and Ford's motivational systems theory. A

work by Cook and Artino established an overview of five contemporary motivational theories [8]. While goal-orientation, social cognitive and self-determination were among the theories compared, the authors also included expectancy-value and attribution theories.

Maslow's theory considered the idea that all motivations were interrelated in the form of a need hierarchy [31]. This hierarchy contained needs that an individual required starting with psychological needs as the foundation. After that, safety, love or belonging, esteem, and self-actualization built on top of that foundation respectively. Self-actualization implied a transcendence whereby that person performed at their highest capacity, developed a lack of prejudice, and accepted the facts.

Campbell [6] considered Ford's theory "a direct offspring or subset of Sigmund Freud's theory." According to Ford, himself, motivational systems theory had a formula that suggested four major prerequisites needed to be met in order for a person to effectively function [14]. These four demands included that individual having the motivation needed to see that goal through, possessing the skill to execute a pattern of activity leading to the desired result, owning the biological structure to support the operation of the motivation, and having the cooperation of a responsive environment that will facilitate progress towards that goal.

The key concepts of the expectancy-value theory are the expectation of success and task value [8]. One can see the expectation of success as the degree to which an individual believes they will be successful if they try. Task value can be interpreted as the personal stake, or interest, someone has in completing a task.

Attribution theory, on the other hand, follows the idea that learners create subconscious causalities after the results of an event [8]. The momentum generated by that event then shapes emotions that drive future motivations.

Maslow's hierarchy of needs and Ford's motivational systems theory predate all of these contemporary motivational theories by at least a decade, while expectancy-value theory and attribution theory were found to be more difficult to measure or compare quantitatively. Zimmerman's self-regulation learning model was also explored during this process [33]. The work of Zimmerman was found to be clearly inspired and influenced by that of Bandura or vice versa. These considerations influenced the decision to omit these other theories from the juxtaposition done in this study.

FINDINGS

Of the 83 survey participants, 62 were not in a group. This meant only 21 of the survey participants were in a group. 41 of the students, not in a group, still felt they made the right decision while 12 felt unsure about their decision and only one student felt they made the wrong decision in pursuing a standalone project.

55 of the students who took the survey had a grade of "A (90 or above)" at the time they took the survey, while 62 students anticipated receiving an "A" by the end of the class. Only 11 students who didn't have an "A" expected to achieve one, which means that four of the people who had an "A" didn't plan on receiving one and that 51 of these 62 were already "A" students.

Demographics

Narrowing down the students in this survey by ethnicity, 55 had a grade of "A." Of these, 39 of the 51 participants that fell into the "Caucasian or White" category met these criteria (Table 1). 15 of the 28 individuals who were Asian also achieved it. Four out of seven Hispanic or Latino respondents had "A" grades. Also, one of three "Other" students held the top grade, while two of three Black or African Americans did the same. Last, all Native American or Alaska native participants were "A" students. It is possible that with a larger representation of each minority the percentage of top-grade students will also vary from the data recorded. By that measure, the most accurate information of these would be the Caucasian or White responses since this group had the most participants by far.

With a majority male class, 47 of 67 men had an "A" in the class (Table 3). Next, the 7 of 15 women in the class had an "A" at the time they responded. The sole "Other" participant, who identified as "Non-binary" received a grade of "A". While knowing the number of students and their grades, it is hard to determine whether or not this data would scale one-to-one if the experiment were replicated on larger sample size.

Age was another phenomenon worth exploring. The majority of students in these classes were between 25 and 31 years old (Table 2). Breaking down hyper-successful (A) students, 24 of 37 students in the age range "25-31 years old" had a grade of "A (90 or above)." The next largest age group consisted of those between 32 and 40 years old. 13 of 21 participants within this group held the top grade. The next largest category, people under 25 years old, had 9 of 15 hyper-successful students. One last group, those over 40 years old, had 9 of 10 of people that fell within his top-notch group. These numbers belong to some of the most balanced figures in this survey. Interestingly, however, the smallest minority in this group was the most successful. All other clusters of age groups had ratios of "A" students that were within five percent of each other.

Table 1. Grades of students by ethnicity

Ethnicity group	*"A"*	*"B"*	*"C"*	*Total*
Native American, etc.	2	0	0	2
Black or African American	2	0	1	3
Caucasian or White	39	9	3	51
Hispanic or Latino	4	3	0	7
Asian	15	10	1	28
Other	1	1	0	3

[a]Each student could identify with multiple ethnicity groups.

Table 2. Grades of students by age group

Age	*"A"*	*"B"*	*"C"*	*Total*
under 25 years old	9	3	3	15
25-31 years old	24	9	2	37
32-40 years old	13	7	0	21
Over 40 years old	9	1	0	10

Table 3. Grades of students by gender

Gender	*"A"*	*"B"*	*"C"*	*Total*
Male	47	14	4	67
Female	7	6	1	15
Other	1	0	0	1

Motivational theories

Using the highest grade in the course as a measure of success, I explored goal-orientation theory, social cognitive theory, and self-determination theory through some of the questions asked.

In relation to goal-orientation theory, every single "A" student (55), at the time the survey was taken, had wanted to pursue "this specific master's degree" for at least a year (Table 4). Approximately half (27) of these students also desired the exact degree for "3 years or more." By that measure, goal-orientation theory proved largely successful. People who had this program in their heads for a long period of time appeared to be motivated to succeed, argued by the results of their grades. Those four participants who did not expect to receive an A grade were included in this data set.

The questions regarding career goals, personal goals, and class goals, with the help of the specific degree, all offered insight into social cognitive theory via the responses of the participants. When asked, 51 of the 55 A students either had a career goal, personal goal, or class goal. Social cognitive theory is strongly reinforced by these results due to over ninety percent of the model students having some kind of goal to work towards (Table 5). The four participants who did not anticipate receiving a grade of "A" also fell into this group.

Self-determination theory argues that given the right ingredients, motivation naturally occurs [29]. However, this can be hindered by negative environmental influences surrounding a person. As such, helpfulness in regards to a student's mentor, the peer feedback system, and their group (if in one) was asked about on a 1 to 5 scale with the highest score being the best (Table 6). 44 of the 55 participants, eighty percent, with an "A" considered their mentor at least "somewhat helpful." The other 11 found their mentors to not be helpful. 38 of the 55 top-grade students, sixty-nine percent, believed the peer feedback system to be at least "somewhat helpful." Interestingly enough, all of the "A" students in a group (13) considered their group to be at least "somewhat helpful." Responses from these questions provided valuable insights into the factors potentially influencing the success of these students. In relation to self-determination theory, this data shows the success of a student's group to be the largest influence on their success in the course. Additionally, all 13 of these "A" students in a group expect to achieve the same grade in the end.

With each of these theories explored, it's important to also uncover why four students felt they wouldn't maintain their grade of an "A" by the end of the class. Discerning the factors influencing the perceived lower grade these participants expected was extremely difficult. They belonged to different age ranges, consisted of both males and females and fell into different ethnic groups. At best, a correlation could be made. However, correlation and causation aren't the same. There was one common theme with these respondents, which was that none of them belonged to a group.

Table 4. Grades by goal-orientation theory

Interest in degree	*"A"*	*"B"*	*"C"*	*Total*
1 year or more	55	14	4	83
3 years or more	21	8	3	32
5 years or more	3	3	1	7
10 years or more	3	3	0	6

Table 5. Grades by social cognitive theory

Goal type	*"A"*	*"B"*	*"C"*	*Total*
Any	51	18	5	77
Career	37	18	3	60
Personal	41	13	3	59
Course-specific	18	9	3	33

Table 6. Grades by self-determination theory

Support system	*"A"*	*"B"*	*"C"*	*Total*
Mentors	42	18	3	65
Peer Feedback	36	16	4	58
Groups	16	6	2	25

[a]Each response was at least "somewhat helpful"

Motivational theories and demographics

In addition to all "A" students answering favorably to the goal-orientation theory question, every single student had actually been wanting to pursue the specific master's degree being taught in the courses that were surveyed for at least a year. An interesting find is that the majority of males answered "1 year or more" for this question, whereas the majority of females answered "3 years or more." No students that identified as female answered "5 years or more," even though two answered as "10 years or more." The majority of participants that identified within the "Caucasian or White" ethnic group stated their desire to pursue the specific master's degree for "1 year or more." Meanwhile, the thirteen of those who fell into the "Asian" group answered "1 year or more" and slightly behind that ten responded "3 years or more." Two-thirds of those under twenty-five years old answered "1 year or more" for the question, while just over half the people between twenty-five and thirty-one answered the same. Additionally, all of those over forty years answered at least "3 years or more."

As for social cognitive theory, 61 of the 67 students who identified as a male had either a personal, course-specific or career goal, whereas all female participants did. Concerning ethnicity, 47 of the 51 students who fell within the "Caucasian or White" ethnic group had a goal of some kind as well as 26 of the 28 students that were "Asian." Most, if not all, members of an ethnic group followed the pattern of having a specific goal with their course, career or personal life. Almost every member of every single age group also had at least one kind of goal, but there was at least one person in each age category without one.

Finally, 53 of 67 had males considered their mentors at least "3 - Somewhat helpful" compared with 12 of 15 females. As for how helpful students thought the peer feedback system to,

even fewer males answered with "3 - Somewhat helpful" or better, with 46 of 67. This question was also complimented by 12 of 15 female students. Only 39 of 51 participants in the "Caucasian or White" ethnic group considered their mentor to be somewhat helpful. Likewise, 34 of these 51 believed their peer feedback to be of the same helpfulness. Most age groups found their mentor to be somewhat helpful or better. The one outlier was those aged between 25 and 31 years old, with 28 of 37 students in this category believing their mentor to be helpful in some degree. As for the peer feedback system, both the "under 25 years old" and the "25-31 years old" age groups appeared to report some of the most negative feedback. Only nine of fifteen students under 25 years old believed peer feedback to be helpful to them, and 25 of the 37 from the latter group thought the same.

CONCLUSION

Answering three significant questions was the ultimate goal of this research. The first considered how age, ethnicity, or gender impacted the success of these students. The success of the individuals, in this case, was measured by the grade a participant held and the grade they awaited. The second question compared each of the three motivational theories, goal-orientation, social cognitive, and self-determination, that survey participants indirectly answered. Letter grades could have also been used to determine the effectiveness of these theories, however, a different approach was taken. Next, the culmination of these theories along with the demographics of participants for the first questionnaire presented the opportunity to answer the final question: does the success of these motivational theories vary by age, ethnicity, or gender?

Age, ethnicity, gender and their impact on success for online graduate students

In regards to age, the majority of survey participants, 37, were between 25 and 31 years old. The largest number of students with "A" letter-grades also came from that age group, however, the highest percentage of these top-grade participants were over 40 years old. One could argue that the younger respondents had the innate advantage of higher engagement due to the findings of Ennis et al., which, in their study, revealed reduced levels of engagement with older age groups [12]. Contrarily, the oldest group in this study happens to also be the highest achieving by the measure of a letter grade. It is also important to outline that there is no direct correlation between cognitive engagement and success in this study.

Over half of the survey participants (51) were revealed to fit into the "Caucasian or White" category. Likewise, this group also achieved the most "A" grades (39). Unfortunately, the only other ethnicity group with over ten respondents was "Asian," consisting of 28 students and 15 of them scoring an "A." This meant that while these results may have been accurately recorded the ratio of "A" students to those with lower grades was not ideal for groups such as "Black or African American," "Hispanic or Latino," "Native American or Alaska native," and "Other."

Most students that partook in the survey were male. Most of these males were also "A" students. The likelihood of a respondent being male was over four times that of them being female. These results weren't particularly shocking, though they should have been. Hussar and Bailey's research had shown that throughout a fifteen-year span women received more bachelor's and master's degrees than men. Yet, even so, there has been steep demand for jobs in the field [16]. The number of computing jobs that remain unfilled is expected to double from half a million to one million by 2024 [30]. Such a disparity alludes to a lack of female representation in the field. The findings of this study concur with the idea of female under-representation.

Motivational theories and their impact on success for online graduate students

Though while it can be argued statistically that goal-orientation theory and social cognitive theory have demonstrated immense success quantitatively, self-determination theory appears to offer the most insight qualitatively from these results. There were four students who didn't believe they would achieve an "A" grade even though they held an "A" at the time they took the survey. Those four students also identified with the ideas surrounding self-determination theory, showing that the final theory offered insights into the absence of success for these participants.

The findings demonstrated that all "A" students who took the survey had a desire to pursue the exact master's degree in the program for a year or more. Results like those agree with the notion that one's motivation to succeed in the course was shaped by their specific learning goals, which appeared to have been prevalent on their mind over time. That notion acts as an extrapolation of Dweck's goal-orientation theory, which states that learning goals have a task choice and task pursuit process by which effort is the path to mastery [10].

Similar to the overwhelming quantitative results achieved by the survey questions asked on goal-orientation theory, the questions surrounding social cognitive theory were also a massive quantitative success. Nearly all "A" students who participated in the questionnaire, 51 of 55, either had a career-specific, course-specific or personal goal in mind. Measurably, student responses agreed by over ninety percent with social cognitive theory. The theory states that when goals are set an individual allocates more effort toward that goal [3]. That effort is assumed to be reflected in the letter grade a student achieved and expected to obtain in the course, although no direct correlation was made between effort and letter grade.

Self-determination theory had the lowest percentage of participant accord, exhibited in eighty percent (44 of 55) of "A" students finding their mentors to be at least "somewhat helpful," and sixty-nine percent (38 of 55) of these top-grade survey-takers believing the peer feedback system to be at least "somewhat successful." An additional survey was sent out to with more qualitative questions concerning student mentors and students, and nearly half of the 58 participants claimed that the quality of their experience with their mentor was one of the most influential factors of their grade. Contrary to the assumptions of the results form the second survey, however, most students were highly satisfied with many aspects of the

mentor system. This led to the omission of the publication of the results of the second survey in this paper.

The success of motivational theories by age, gender, and ethnicity

When motivational theories were contrasted with the demographics of these survey participants, certain patterns occurred. Females seemed to be more inclined to the ideals of goal-orientation theory since the majority of them desired to pursue their specific master's degree two years longer than male participants. It was also found that all those aged over forty years old had been wanting a specific degree for three years or more.

Social cognitive theory didn't seem to adhere to a specific demographic. From what information that was gathered, most groups followed similar trends with the majority of their responses.

Self-determination theory experienced heavier volatility with male respondents, as their responses were generally less optimistic than females. Those identifying as "Caucasian or White" also appeared to have less pleasant feedback for their mentors and the peer feedback system. In terms of age group, those under twenty-five years old appeared to have believed the least in the helpfulness of their mentors and the peer feedback system.

Room for improvement

A clear missed opportunity was failing to ask deeper questions about the peer feedback system, which was equally, if not worse, received in terms of negative survey feedback. The assumptions made were incorrect after aggregating the responses to the second survey. Likewise, more questions could have been asked surrounding each motivational theory toward painting a clearer picture of each respondent's nuances. Obtaining the same respondents after they had already answered the first survey was an impossible task, so the second survey had to discard the idea of mapping participants by demographics.

The inability to provide fruitful information from the results of the second survey was a calculated risk taken on the chance that more meaningful insights could be reached. Unfortunately, the insights desired were not arrived upon and the data isn't believed to add any new value to this study.

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REFERENCES

1. I. E. Allen and J. Seaman. 2003. *The Quality and Extent of Online Education in the United States.* Sloan-C, Newburyport, MA, 9.
2. C. Ashong and N. Commander. 2012. Ethnicity, Gender, and Perceptions of Online Learning in Higher Education. *Journal of Online Learning and Teaching* 8, 2 (2012), 98–110.
3. A. Bandura. 1991. Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes* 50, 2 (1991), 248–287. DOI: http://dx.doi.org/10.1016/0749-5978(91)90022-L
4. J. Bird and C. Morgan. 2003. Adults contemplating university study at adistance: Issues, themes and concerns. *International Review of Research in Open and Distance Learning* 4, 1 (2003), 62–82.
5. J. Bocchi, J. K. Eastman, and C. O. Swift. 2004. Retaining the onlinelearner: Profile of students in an online MBA program and implications for teaching them. *Journal of Education for Business* 79, 4 (2004), 245–253. DOI:http://dx.doi.org/10.3200/JOEB.79.4.245-253
6. M. M. Campbell. 2007. Motivational Systems Theory and the Academic Performance of College Students. *Journal of College Teaching Learning* 4, 7 (2007), 11–24.
7. S. Carr. 2000. As Distance Education Comes of Age, the Challenge Is Keeping the Student. *Chronicle of Higher Education* 46, 23 (2000), A39–A41.
8. D. Cook and A. R. Artino. 2016. Motivation to learn: an overview of contemporary theories. *Medical education* 50, 10 (2016), 997–1014. DOI: http://dx.doi.org/10.1111/medu.13074
9. E. L. Deci and R. M. Ryan. 1985. *Intrinsic Motivation and Self-Determination in Human Behavior: Perspectives in Social Psychology.* Springer, Boston, MA, 43–44.
10. C. S. Dweck. 1986. Motivational Processes Affecting Learning. *American Psychologist* 41, 10 (1986), 1040–1048. DOI: http://dx.doi.org/10.1037/0003-066X.41.10.1040
11. R. J. Elich and D. Russ-Eft. 2011. Applying Social Cognitive Theory to Academic Advising to Assess Student Learning Outcomes. *NACADA Journal* 31, 2 (2011), 5–15.
12. G. E. Ennis, T. M. Hess, and B. T. Smith. 1986. The Impact of Age and Motivation on Cognitive Effort: Implications for Cognitive Engagement in Older Adulthood. *Psychology and Aging* 28, 2 (1986), 495–504. DOI:http://dx.doi.org/10.1037/a0031255
13. J. Fischmann. 2011. Online colleges reveal new graduation and dropout rates, to a degree. *Psychology and Aging* (2011).
14. M. Ford. 1992. *Motivating humans: Goals, emotions, and personal agency beliefs.* Sage Publications, NewBury Park, CA, 70.

15. W. J. Hassar and T. M. Bailey. 2014a. *Projections of education statistics to 2022 (NCES 2014-051).* Government Printing Office, Washington, DC, 27.

16. W. J. Hassar and T. M. Bailey. 2014b. *Projections of education statistics to 2022 (NCES 2014-051).* Government Printing Office, Washington, DC.

17. F. A. Inan and E. Yukselturk. 2006. Examining the Factors Affecting Student Dropout. *The Turkish Online Journal of Distance Education* 7, 3 (2006), 76–88.

18. T. M. Jamison. 2003. *Ebb from the Web: Using motivational systems theory to predict student completion of asynchronous Web-based distance education courses*. Ph.D. Dissertation. George Mason University, Fairfax, VA.

19. Y. Koseoglu. 2013. An Application of the Self-Determination Theory - Academic Motivations of the First-Year University Students for Two Successive Years. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)* 4, 3 (2013), 447–454.

20. D. L. McCollum and L. T. Kajs. 2007. Applying Goal Orientation Theory in an Exploration of Student Motivations in the Domain of Educational Leadership. *Educational Research Quarterly* 31, 1 (2007), 45–59.

21. A. Norouzi, J. Koohpayezade, L. Fata, and S. K. Soltani-Arabshahi. 2007. Predicting Academic Performance of Medical Students in Iran University of Medical Sciences based on Martin FordâĂŹs Theory of Incentive Systems. *Journal of Medical Education* 17, 2 (2007), 93–99.

22. D. G. Oblinger and B. L. Hawkins. 2005. The myth about E-learning. *EDUCAUSE Reviewy* 40, 4 (2005), 14–15.

23. Georgia Institute of Technology. n.d. Online Master of Science: Computer Science (OMS CS). Website. (n.d.). Retrieved March 22, 2019 from https://www.omscs.gatech.edu/.

24. R. Pastore and A. Carr-Chellman. 2009. Motivations for Residential Students to Participate in Online Courses. *Quarterly Review of Distance Education* 10, 3 (2009), 263–277.

25. C. Pulfrey, C. Darnon, and F. Butera. 2013. Autonomy and Task Performance: Explaining the Impact of Grades on Intrinsic Motivation. *Journal of Educational Psychology* 105, 1 (2013), 39–57. DOI: http://dx.doi.org/10.1037/a0029376

26. E. Qureshi, L. L. Morton, and E. Antosz. 2002. An interesting profileâĂŤUniversity students who take distance education courses show weaker motivation than on-campus students. *Journal of Interactive Online Learning* 5, 4 (2002), 1–10.

27. G. E. Rakes and K. E. Dunn. 2010. The Impact of Online Graduate StudentsâĂŹ Motivation and Self-Regulation on Academic Procrastination. *Journal of Interactive Online Learning* 9, 1 (2010), 78–93.

28. A. P. Rovai. 2003. In search of higher persistence rates in distance education online programs. *The Internet and Higher Education* 6, 1 (2003), 1–16.

29. R. M. Ryan and E. L. Deci. 2000. Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist* 55, 1 (2000), 68–78. DOI: http://dx.doi.org/10.1037110003-066X.55.1.68

30. B. Scarpelli, B. Miller, and R. Stephens. 2018. *The State of the App Economy (5th ed.).* The Association for Competitive Technology (ACT), Washington, DC.

31. J. Suyono and S. W. Mudjanarko. 2017. Motivation Engineering to Employee by Employees Abraham Maslow Theory. *American Psychologist* 2, 1 (2017), 27–33. DOI:http://dx.doi.org/10.26737/jetl.v2i1.141

32. S. J. Yoo and W. D. Huang. 2013. Engaging Online Adult Learners in Higher Education: Motivational Factors Impacted by Gender, Age, and Prior Experiences. *The Journal of Continuing Higher Education* 61, 3 (2013), 151–164. DOI: http://dx.doi.org/10.1080/07377363.2013.836823

33. B. J. Zimmerman. 1989. A Social Cognitive View of Self-Regulated Academic Learning. *Journal of Educational Psychology* 81, 3 (1989), 329–339. DOI: http://dx.doi.org/10.1037/0022-0663.81.3.329