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Influence of Due Date Frequency on Student Performance, Learning and Anxiety in an Introduction to MIS Course

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Abstract

Faculty strive to design their course activities to yield high levels of student learning. After selecting or developing course projects, the instructor must determine the appropriate due dates and time frames for student deliverables. This study investigates whether student performance, learning, and anxiety are different under multiple project submission deadline methods. Project submission dates were manipulated between intermediate subtask due dates (specified submission dates for project subtasks) and one final submission date (with and without suggested intermediate subtask deadlines). Data from a database project given in an Introduction to Management Information Systems course were collected from 228 business students over a four semester period. This study found that students performed best when the project had one submission date with suggested intermediate subtask deadlines. The study also found that students tended to start the project with intermediate subtask submission deadlines later than they had planned while students facing one final project deadline, or one final project deadline with suggested intermediate subtask deadlines, did not. In addition, students assigned the project with intermediate subtask submission deadlines completed the project by the final due date at much higher rates than students with one submission deadline and with suggested intermediate subtask deadlines.

Keywords: Pedagogy, Student Performance, Student Anxiety, Project Due Dates, Procrastination

1.0 INTRODUCTION

With budgets tightening and competitive forces expanding, employees around the nation are being asked to do more with less while producing superior results. College campuses are no different as budgets are squeezed, positions, eliminated with services stretched, and performance-based funding models being developed (NCSL, 2013). Faculty continue to be

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asked to do more with limited resources while producing better equipped students who obtain high paying jobs in a recessionary economy.

We, as faculty, watch our class sizes gradually increasing and the amount of time available per student further distributed. Students' resources are stretched as well as students are holding down multiple jobs to pay for increasing tuition rates and living expenses. The competitive landscape is also demanding more from college graduates as an increasing emphasis is placed on service opportunities and experiential learning. To substitute for the amount of time that students are available and faculty have for providing personal attention, we must find mechanisms for assisting students to be even more successful in our courses.

One area of potential improvement is procrastination, a problem that seems to plague most students (and faculty) with demanding schedules. It is easy to relegate the task with the least pressing deadline to the end of the queue. This study examines whether a method of reducing student procrastination leads to increased student learning and decreased student anxiety in an Introductory MIS course.

2.0 LITERATURE REVIEW

Learning models indicate that students' learning progresses from a state of fact memorization to a level of concept application (Anderson & Krathwohl, 2001; Bloom, 1956). In Anderson and Krathwohl's (2001) model, the authors separated Bloom's "Cognitive Process" into six categories progressing from remembering to creating with the transfer of knowledge increasing as the tasks move from understand to create (Surendran, Amer, & Schwieger, 2011). (See Figure 1.) However, variables external to the educational process have an effect on learning outcomes.

One such variable is procrastination. In 1986, Rothblum, Solomon and Murakami defined academic procrastination as the "tendency to (a) always or nearly always put off academic tasks, and (b) always or nearly always experience problematic anxiety associated with this procrastination" (p. 387). Task anxiety has been noted in several articles to hinder student performance. (Onwuegebuzie & Jio, [2004, p1.] provide a categorical listing.)

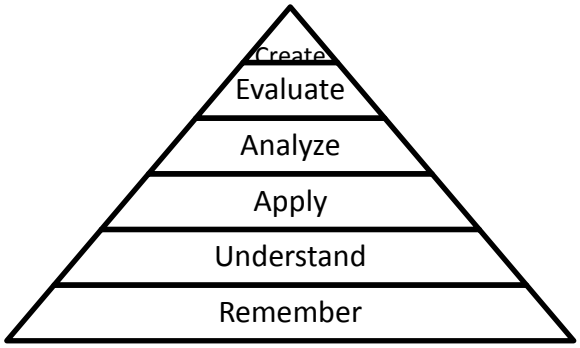

Figure 1 - Anderson & Krathwohl's Cognitive Model

In addition, a number of studies have examined procrastination and student performance in the classroom. Research published in 1977 by Ellis and Kraus estimated that 95% of American college students procrastinated. In an article published 7 years later, Solomon and Rothblum (1984) reported that 50% of the students surveyed in their study indicated that they procrastinated on academic tasks at least half the time. Approximately 38% of the respondents indicated that they procrastinated occasionally.

Procrastinators have been found to make more errors than non-procrastinators (Ferrari, 2001; Humphrey & Harbin, 2005; Klausen, Ang, Chong, Krawchuk, Huan, Wong & Leo, 2010). However, there appears to be a difference among types of procrastinators. Haycock, McCarthy and Skay (1998) noted that students who chose to postpone a task until a later date were not necessarily procrastinating, but instead, were managing their time and tasks. Chu and Choi (2005) labeled this type of worker as an active procrastinator.

Chu and Choi (2005) examined the differences among non-procrastinators, active procrastinators, and passive procrastinators. The authors found that people who felt in control of their time (non-procrastinators and active procrastinators) had higher task performance outcomes (Choi & Moran, 2009; Chu & Choi, 2005). Similarly, Janssen and Carton (1999) found that students having an internal locus of control started and completed projects earlier than those students having an external locus of control.

Senecal, Koestner, and Vallerand (1995) found that procrastination was "a motivational problem

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involving more than just poor time management skills or trait laziness" (p. 607). The authors found, however, that no matter how important students considered their courses to be for achieving their future life goals, they were more likely to procrastinate if they were not genuinely interested in the course material (intrinsic motivation). (Senecal, et al,, 1995: p. 617). Thus, academic engagement has been noted to be a predictor of high achievement (Park, Holloway, Arendtsz, Bempechat, & Li, 2012).

Bui (2007) examined the effects of evaluation threat and trait procrastination on 72 private university students in southern California. Bui's study found that, depending upon the student's level of trait procrastination, faculty can reduce behavioral delays by increasing evaluation threat. Likewise, Ariely and Wertenbroch (2002) found that people who were given a series of externally imposed, evenly paced deadlines performed better than those who applied self-imposed deadlines.

3.0 RESEARCH MODEL

In reviewing prior research, three related variables seemed to surface that had an effect on student success: procrastination (negative impact), types of deadlines and intrinsic motivation. In Figure 2, we have used these factors to produce a model of factors affecting student success. Procrastination has been found to have both a positive and negative effect on work performance. However, managed procrastination, like non procrastination, seems to attribute to positive work outcomes. The second variable, "Deadlines" can contribute both positively and negatively to overall work outcomes as well. However, people who have deadlines imposed over a period of time are less likely to procrastinate and more likely to perform at a higher level. When people want to do something versus being required, "Intrinsic Motivation," they are less likely to procrastinate and more likely to have a positive work outcome. If together, these findings prove true in the classroom, a small investment in setting intermediate project deadlines could reap the benefits of higher quality projects and more engaged students.

In the next section, the authors describe the Introduction to Management Information Systems (MIS) course offered at their university and a database project assigned within the course on which they tested the model. The authors examined the effects of a single deadline versus intermediate assignment subtask deadlines on student performance and anxiety.

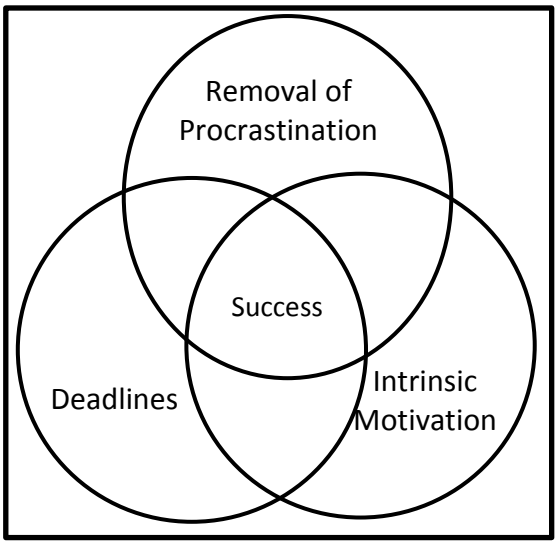

Figure 3 - Factors Affecting Student Success

4.0 PROJECT BACKGROUND

The Introduction to MIS course at the authors'' institution is a junior level class taken by all business majors as part of their core curriculum. The prerequisites for this course include an introduction to basic computing skills course, junior level standing, and concurrent enrollment in a management concepts course. Thus, students enter the course with a general understanding of productivity software and basic business concepts.

The course includes a number of projects to allow students to gain an application-based understanding of the course concepts. Students are introduced to Google + as a collaboration tool for building group projects virtually. The Introduction to MIS course requires 4 group projects over the course of the semester. This tool provides a virtual resource for student groups to use as they work on their projects. Students are also briefly introduced to Prezi for providing online presentations.

The first big project reviews the main Excel concepts to ensure that students have basic

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electronic spreadsheet skills and can apply them to a business situation. Students work on this project individually with one week to complete it.
Building upon the Excel review exercise, the next project uses the pivot tables and charts features of Excel to analyze business data from multiple perspectives. Students are given a week to complete this assignment.

As the course content begins to transition into hardware and telecommunication concepts, the next project examines the technology purchase process. Students work in teams of two to recommend hardware and software purchase options for a specified case scenario. The teams submit the assignment for grading by the following class period.

The next project focuses upon Internet technologies in which the students develop social media plans for a business situation and provide the deliverables in the format of a web site. This team assignment is usually due in three weeks, which is a much longer time frame than the other projects.

While the social media Web site project deadline is open, coverage of database concepts begins. The database learning module covers design and development concepts including normalization, entity relationship diagrams, and building a Microsoft Access database. Students usually have two and half weeks to complete their individual database assignment.

5.0 Project Description

In the introduction to basic computing skills course taken by freshmen, students are introduced to Microsoft Access as a personal database development tool. Approximately two weeks of class time are dedicated to providing a cursory overview to the program introducing students to tables, forms, queries and template based reports. Little time is dedicated to each aspect of the program and by the time the students enroll in the Introduction to MIS, taken by business juniors and seniors, most of their database knowledge has been lost.

The database learning module in Introduction to MIS focuses upon explaining data, fields, attributes, keys (primary, foreign, candidate, and composite), records, entities and their relationships, and good data management practices. The students are introduced to systems development concepts such as designing a database, normalization, and Entity Relationship (ER) diagrams and given an in-class tutorial on Microsoft Access. In addition, the database module covers setting keys and field properties, the Access relationship report, forms, queries, and customized reports.

After the first week of the three-week database module, students are assigned a database development project in which they apply these concepts to construct the ER diagram, create data, design queries and develop reports to fulfill the needs of a specific business scenario. The database project is written toward a specific real life situation or simulated scenario to encourage student interest (intrinsic motivation) and engage students in the learning process. The project follows a basic format in terms of structure (inventory, payroll, and point of sale system), however the database scenario changes each semester based upon availability of clients including a: bike shop, bakery, high end second hand clothing store, and third world country medical clinic. Students normally have two and half weeks to complete the database project with the project due in the last class period before finals' week.

Leaving the database design project to the end of the semester is not the ideal situation. At this point, students are tired of the class and are overwhelmed by multiple courses requiring end of the semester work. This learning unit addresses more difficult material to which the students are less familiar. However, due to the progression of course concepts, the database material is best addressed at the end of the semester.

6.0 METHODOLOGY

This study explores whether project submission (due) date method (intermediate subtask or single deadlines) influences the student project scores, knowledge gain, and self-reported project anxiety. Data was collected in seven sections over four semesters from students taking a junior level, business core required MIS course.

Data Collection

Data was collected from students completing a database project in the Introduction to MIS

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course in Fall 2011, Spring 2012, Fall 2012, and Spring 2013. The same instructor taught all sections of the MIS course in which data was collected. The instructor used the same format and covered the same topics in all sections. The number of students completing the database project were Fall 2011 (32), Spring 2012 (61), Fall 2012 (68), and Spring 2013 (67).

Immediately prior to instruction on database concepts, a pretest survey was administered to students in the Spring 2012, Fall 2012, and Spring 2013 terms (Appendix A). The pretest explored the students' database concept knowledge (with 15 questions) as well as their general feelings toward project management (3 questions) and anxiety levels related to projects (2 questions).

Within one week of the final due date for the database project, the instructor evaluated the projects and assigned a score (grade) to each student's database project. This project score was a measurement of the student's performance on completing the project.

A posttest was given one week after students had completed the project. By this time, students had received their scores and feedback on the database project. The posttest was similar to the pretest including the same 15 multiple choice database concept knowledge questions and slightly reworded anxiety and project management questions oriented toward the database assignment.

The project scoring and collection was completed by the researcher assigned to the course using the same grading rubric (projects were scored in the same manner) across semesters. The tabulation of the results was provided by the second researcher who was not associated with the courses.

Variables

The variable that was manipulated in this study was project submission (due) date method (named METHOD). METHOD had three levels: (1) single deadline - one submission due date and no suggested guidelines on when various parts of the project should be completed (2) suggested deadlines - one final submission due date and suggested intermediate subtask dates when various parts of the project should be completed and (3) intermediate submission deadlines -various due dates for different subtasks of the database project to be submitted (these dates aligned with the suggested deadlines in level two of this variable).

METHOD was varied by term. In the Fall 2011 term, the project was assigned with one single submission deadline and no suggested intermediate deadlines for when various parts of the project should be completed. Both the Spring 2012 and Fall 2012 terms had the project assigned with one submission deadline and suggested intermediate deadlines for project subtasks. In the Spring 2013 term, the project was assigned with intermediate subtask submission deadlines that aligned with the suggested deadlines provided in Spring 2012 and Fall 2012 terms.

Three dependent variables were used to evaluate whether varying METHOD provided different results. One dependent variable used was entitled PROJECT_SCORE. This variable represented the grade (score) each student received on their database project. For this study, all project scores were converted to a 100 point scale and the value range for PROJECT_SCORE ran from a minimum of 13 to a maximum of 100.

Another dependent variable used in the study was KNOWLEDGE_GAIN. This variable represented the increase in the number of database concept questions answered correctly on the posttest in comparison to the same questions on the pretest. Performance on database concept questions on both the pretest and post were converted to a 100 point scale. KNOWLEDGE_GAIN represents the difference in two 100 point variables (posttest less pretest). The KNOWLEDGE_GAIN score ranged from a minimum of -33 to a maximum of 80.

The last dependent variable used was PROJECT_ANXIETY. This variable collected data on the posttest self-assessment anxiety question in which students were asked whether they experienced extra stress from the database project due date. PROJECT_ANXIETY was a categorical variable with five levels: (1) No extra stress because I usually get projects done in time, (2) No extra stress because I am used to handling multiple responsibilities, (3) Yes extra stress because I wait until the last minute to work on the database project, (4) Yes extra stress because I am not good at managing my

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time, and (5) Other please explain. On the post test, students responded to the choices 30%, 33%, 13%, 6%, and 18%, respectively.

Hypotheses

The first research question of this study focused upon whether using different project submission due date methods result in different levels of student performance and knowledge gain. This question was explored with our first two hypotheses. Bui (2007) found that increased evaluation threat can reduce procrastination. Bui's work (2007) led the researchers to believe that reducing procrastination would improve student performance. In addition, Ariely and Wertenbroch (2002) found that subjects performed better when given evenly paced deadlines rather than imposing the deadlines on themselves. Based on these studies, the researchers believed students would earn a higher score and achieve greater knowledge gain when the database project had intermediate submission deadlines rather than a single final deadline. These beliefs were tested to see if PROJECT_SCORE and KNOWLEDGE_GAIN varied across different levels of the METHOD variable. Therefore, our first two hypotheses (stated in the null) are:

> H1: PROJECT_SCOREs will be equal regardless of the METHOD used to assign the database project.
>
> H2: KNOWLEDGE_GAIN will be equal regardless of the METHOD used to assign the database project.

The second research question focused upon whether using different project submission due date methods resulted in different levels of student anxiety. This question was investigated with the third hypothesis. Rothblum, Solomon and Murakami (1986) found anxiety to be associated with student procrastination. Therefore, if procrastination can be reduced with intermediate deadlines, then anxiety can also be reduced with intermediate deadlines. Our third hypothesis (stated in the null) questions whether anxiety levels are different across different levels of the METHOD variable:

> H3: PROJECT_ANXIETY will be equal regardless of the METHOD used to assign the database project.

7.0 FINDINGS & DISCUSSION

Project Submission Due Date Method Effect on Student Performance

Table1 reports the performance measures (PROJECT_SCORE and KNOWLEDGE_GAIN) for each level of the project submission due date method (METHOD). For all levels of METHOD combined, the mean scores were PROJECT_SCORE 83.026 and KNOWLEDGE_GAIN 33.189.

In order to test Hypothesis 1 probing whether PROJECT_SCORE would be different among levels of METHOD, an analysis of variance (ANOVA) was performed on the dependent variable PROJECT_SCORE with the independent variable of METHOD. This test yielded F=3.834 with a p=.023 and the Levene Statistic indicated that group variances were equal. This result indicated that PROJECT_SCORE was different at one or more levels of METHOD. Thus, H1 was rejected. This finding was further explored with the Hochberg GT2 test and Games-Howell test. These tests indicated that PROJECT_SCORE was significantly higher when the database project had one due date with suggested intermediate subtask deadlines. PROJECT_SCORE was not different between any of the other levels of METHOD.

Finding that PROJECT_SCORE was higher only when the due date method requested one submission deadline with suggested intermediate subtask deadlines was in contradiction to the original prediction. The researchers thought that having enforced intermediate deadlines would decrease procrastination as was found in Bui (2007). The researchers further believed that decreased procrastination would lead to better performance on the project. However, similar to other research, the students performed better when they had a suggested timeline to follow, but had more control over the actual time of submission (Ariely and Wertenbroch, 2002; Choi & Moran, 2009; Chu & Choi, 2005).

In order to test Hypothesis 2 investigating whether KNOWLEDGE_GAIN was different among levels of METHOD, an independent sample t-test was run on KNOWLEDGE_GAIN with two levels of METHOD (one due date with suggested intermediate subtask deadlines and required intermediate subtask deadlines).

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METHOD level of one due date with no suggested deadlines was not included because the pretest and posttest were not given to this group. The t-test yielded t=1.300 with a p=.195 and the Levene Statistic indicated that the group variances were equal. This result indicated no differences in KNOWLEDGE_GAIN under either METHOD examined. Hypothesis 2 failed to be rejected.

Project Submission Due Date Method Effect on Student Anxiety

Hypothesis 3 questioned whether PROJECT_ANXIETY (a categorical variable) was different among levels of METHOD. To test Hypothesis 3, a cross tabulation comparing students' reported PROJECT_ANXIETY responses by METHOD to that expected based on the composite distribution was conducted. For this analysis, only two levels of METHOD were examined because PROJECT_ANXIETY was not collected from the group with one submission due date and no suggested deadlines. Table 2 reports the percentage of reported responses and expected responses by PROJECT_ANXIETY response and METHOD. The crosstabulation yielded a Chi-Square of 1.034 with a probability of .905. This finding indicated that the stress level from increased evaluation threat did not reduce student stress from the Database project due dates. Therefore, Hypothesis 3 failed to be rejected.

Other Findings

On the pretest survey, three questions inquired into students' project management tendencies and two questions addressed anxiety. The posttest survey asked similar questions but focused upon how the students managed their database project.

One question on both surveys asked students how they approached a project (pretest) and how they completed the database project. Table 3 gives the response percentages within each survey. A crosstabulation on this data yielded a Chi-square of 10.955 with a probability of .012. The significant result was further explored to find that the difference between how students say they tend to approach a project and how students actually completed the database project was only in the intermediate subtask deadlines METHOD. Table 4 provides the response percentage within each survey for only the intermediate subtask deadlines METHOD level. Notice that 33% of the students with intermediate project subtask deadlines stated that they tended to start projects early and finish early while only 10% of these students actually did so when completing the database project. Also of note in Table 4 is that 11% of the students with intermediate subtask deadlines stated that they worked on projects steadily from assignment date to submission due date while 31% completed the database project in this manner. Perhaps the students felt the relief of some pressure because the instructor had set firm deadlines rather than requiring students to set the pace themselves. This would fall in line with the findings of Bui (2007). However, if this were the case, one wonders why there was no effect on students' self-reported stress level related to project due dates.

When asked how students were going to plan, and did plan, their approach to completing the database project, for the most part, students executed their planning approach as indicated in the pretest. The most commonly selected approach (35%) was to "talk to classmates to see how they were going to approach the project." The second highest approach (29%) was to "make an immediate game plan to spread the work evenly across the assignment period." Followed by the approach to "put off the project until the due date got really close" (25%) and "to complete the project immediately so I no longer have to worry about it" (11%).

Students were also asked how they would like a project assigned before (pretest) and after (posttest) completion of the project. Interestingly, there was a significant difference (Chi-square of 9.916 with probability of .019) between how they wanted a project assigned before the database project than how they wanted after completing the database project. Table 5 shows the actual and expected percentage of responses under both the pretest and posttest. Notice in Table 5 that the students' responses lean more heavily toward wanting the project with intermediate subtask deadlines. Further analysis of these responses indicates that students with one submission deadline and suggested intermediate subtask deadlines changed their answer while students with intermediate subtask deadlines did not. This finding also follows Bui (2007) findings that more frequent evaluation dates reduces procrastination and anxiety.

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PROJECT_ANXIETY was collected before and after completing the database project. The students changed their answers to this categorical variable significantly (Chi-square 10.619 with a probability of .031) between the pretest and posttest surveys. Table 6 indicates the response percentages within each survey. There was a decrease in the number of students who responded that project deadlines did not cause them stress because they were used to multiple responsibilities. In the posttest, there was an increase in other responses to whether project deadlines caused them stress. Many of the other responses indicated increased stress because the end of the term was an extremely busy time for them and the database project was more challenging than they anticipated. The changes in PROJECT_ANXIETY from pretest to posttest were not different between METHOD level of one submission deadline with suggested intermediate subtask deadlines and intermediate subtask deadlines.

On the posttest, students were asked when they started and finished working on the database project. The responses to the question, "When did you start working on the database projects?" are as follows:

- 19% "when the project was first assigned."
- 30% "two to three days after the project was assigned."
- 19% "four to five days after the project was assigned."
- 26% "two to three days before the project was due."
- 6% "the day before or day the project was due."

A cross tabulation (Chi-square of 6.491 with a probability of .165) indicated that there was no difference in responses regarding when the project was started between students with one submission deadline and suggested intermediate subtask deadlines and those with intermediate subtask deadlines.

Responses to the posttest question asking, "When did you finish the database project?" were:

- 18% "two of three days before the project deadline."
- 47% "one day before the project deadline."
- 24% "the day the project was due."
- 11% "did not complete the project."

A cross tabulation (Chi-square of 14.081 with a probability of .003) indicated that there was a difference regarding when the database project was finished between students with one submission deadline and suggested intermediate subtask deadlines and those with intermediate subtask deadlines. Actual and expected percentages of each reply to finishing the project are found in Table 7. A number of interesting observations were made from Table 7. First, students with one deadline and suggested intermediate deadlines finished the last part of the project earlier than students with intermediate subtask deadlines. A second notable point in Table 7 is that only 1% of students with intermediate subtask deadlines did not finish the project while 16% of students with one submission deadline and suggested intermediate subtask deadlines did not finish the project.

8.0 FUTURE RESEARCH

Based on the existing literature and this study's findings, additional research of improving student learning is needed. The current study lacked examination of the model variable "intrinsic motivation" also known as student engagement in the topic. In order to master skills covered in the Introduction to MIS course, students needed to complete a database project. The database project themes are selected based upon availability of clients. In order to address the basic concepts of database development while meeting the rudimentary needs of the client, the structure of the database was limited to simple processes. Little flexibility is allowed for modifying concepts according to student interests. Now that several versions of the database project have been created, an additional pretest question could better align available scenarios with the students' interest. Additional posttest questions could measure the students' intrinsic motivation of database theme.

The current study was conducted in a business core class composed of students from various business majors. A replication of this study in a class required for one major may lead to different findings. Initially, the researchers believe that intrinsic motivation would be higher in a class for one's major. A comparison could then be conducted between the results of the business core study versus the major specific study.

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9.0 CONCLUSION

Developing engaging student projects that yield high levels of student learning in a limited timeframe is a challenge for most faculty. Similar to the findings of Ariely and Wertenbroch (2002), our study found that students performed best when they were given one submission deadline with suggested intermediate subtask deadlines. As alluded to in Ariely and Wertenbroch's research (2002), placing the student in control with guidance is the best method for improving performance.

Students' anxiety toward the project increased from before starting to after finishing the project. Perhaps this is due to the project being more challenging than the students anticipated or perhaps that the project was completed at the semester end. An increase in anxiety was experienced by both students with one submission deadline and suggested intermediate subtask deadlines and students with intermediate subtask deadlines.

Our study revealed that students with intermediate subtask deadlines finished the project by the due date at a higher rate than students with suggested intermediate subtask deadlines. However, the students with intermediate subtask deadlines started their projects later than they typically start projects while the students with suggested subtask deadlines started their database project at the same time they typically start projects.

Thus, when developing exercises to enhance student performance and learning while minimizing negative procrastination, faculty should consider the value of incorporating suggested subtask deadlines into project descriptions. The slight modification of projects to incorporate suggested deadlines throughout the process of project completion can reap noticeable rewards for both the student and the faculty.

10.0 REFERENCES

Anderson, L. W. & Krathwohl, D. R. (Eds.) (2001) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Allyn & Bacon. Boston, MA: Pearson Education Group.

Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines, and performance: Self-control by precommitment. *Psychological Science*, 13(3), 219–224.

Choi, J. N., & Moran, S. V. (2009). Why not procrastinate? Development and validation of a new active procrastination scale. *The Journal of Social Psychology*, 149(2), 195-211. Retrieved from http://search.proquest.com/docview/199803335?accountid=38003

Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, 145, 245-264. Retrieved from http://search.proquest.com/docview/199840128?accountid=38003

Bloom, B.S. (Ed.) (1956) *Taxonomy of Educational Objectives, the classification of educational goals - Handbook I: Cognitive Domain* New York: McKay.

Bui, N. H. (2007). Effect of evaluation threat on procrastination behavior. *The Journal of Social Psychology, 147*(3), 197-209. Retrieved from http://search.proquest.com/docview/199784678?accountid=38003

Ellis, A. & Kraus, W.J. (1977). Overcoming procrastination. New York: Signet

Ferrari, J. R. (2001). Procrastination as self-regulation failure of performance: Effects of cognitive load, self-awareness, and time limits on 'working best under pressure.' 15(5) 391-406.

Haycock, L. A., McCarthy, P., & Skay, C. L. (1998). Procrastination in college students: The role of self-efficacy and anxiety. *Journal of Counseling and Development: JCD*, 76(3), 317-324. Retrieved from http://search.proquest.com/docview/218963928?accountid=38003

Humphrey, P., & Harbin, J. (2010). An exploratory study of the effect of rewards and deadlines on academic procrastination in web-based classes. *Academy of Educational*

ISSN: 2167-1435
v30 n2520

Leadership Journal, 14(4), 91-98. Retrieved from http://search.proquest.com/docview/763259610?accountid=38003

Janssen, T. and Carton, J. S. (1999). The Effects of Locus of Control and Task Difficulty on Procrastination. *The Journal of Genetic Psychology*, (160),4

Klausen, R. M., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y. F., & Yeo, L. S. (2010). Academic procrastination in two settings: Motivation correlates, behavioral patterns, and negative impact of procrastination in Canada and Singapore. *Applied Psychology*, 59(3), 361-379. doi:http://dx.doi.org/10.1111/j.1464-0597.2009.00394.x

National Conference of State Legislatures (2013). Performance funding for Higher Education. Retrieved from http://www.ncsl.org/issues-research/educ/performance-funding.aspx Retrieved on May 28, 2013.

Onwuegbuzie, A. J., & Jiao, Q. G. (2004). Information search performance and research achievement: An empirical test of the anxiety-expectation mediation model of library anxiety. *Journal of the American Society for Information Science and Technology, 55*(1), 41-54. Retrieved from http://search.proquest.com/docview/231485754?accountid=38003

Park, S., Holloway, S. D., Arendtsz, A., Bempechat, J., & Li, J. (2012). What makes students engaged in learning? A time-use study of within- and between-individual predictors of emotional engagement in low-performing high schools. *Journal of Youth and Adolescence*, 41(3), 390-401. doi:http://dx.doi.org/10.1007/s10964-011-9738-3.

Rothblum, E.D., Solomon, L.J., & Murakami, J. (1986). Affective, cognitive, and behavioral differences between high and low procrastinators. *Journal of Counseling Psychology*, 33, 387-394.

Senécal, C., Koestner, R., & Vallerand, R. J. (1995). Self-Regulation and Academic Procrastination. *The Journal of Social Psychology* 135(5), 607-619.

Solomon. L., J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive behavioral correlates. *Journal of Counseling Psychology*, 31, 503-509.

Surendran, K., Amer, S., Schwieger, D. (2012). CIS Program Redesign Driven By IS2010 Model: A Case Study. Information Systems Education Journal, 10(5) pp 37-48. http://isedj.org/2012-10/ ISSN: 1545-679X. (A preliminary version appears in The Proceedings of ISECON 2011)

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Appendix A - Pretest Questions

1. Collectively, one complete student's instance of a studentID, fname, lname, dob, gender, entrydate would be called a: _____ . An example of this would look like: (111111111, Mark, Brown, 1/08/89, M, 8/20/2009)

2. The field in a record that uniquely identifies instances of that record so that it can be retrieved, updated, or sorted best describes a(n):

3. This common field in one entity that provides a connection to the unique identifying field of another entity is a:

4. With its connected tables, Microsoft Access is a(n) example of a(n):

5. A person's firstname is an example of a(n):

6. _____ are used to read, insert, modify, and delete data.

7. A person, place, or object (something that you collect data about) would be represented in a database application as a(n) _____.

8. Entities have _____ that describe the characteristics of the entity. (They are like adjectives.)

9. _____ are the final judges as to what data the database should contain and how the records in that database should be related to one another.

10. When the unique identifier in a table consists of two or more fields, this is called _____

11. When you have the choice of two equally good fields to use as the unique identifier for your table, but you select only one, before the selection is made, both fields are called:

12. This is the foundation of a database. Without it, you can create nothing else.

13. This is used to question a database to retrieve specific records.

14. This is used to present database data in a structured format.

15. Before building a database, the users construct a _____ to help design the database.

16. When you are assigned a project, do you start working on the project immediately and finish it early or wait until closer to the deadline to work on the project?

A. Start early and finish early
B. Start early, procrastinate and finish it before the deadline
C. Work steadily on the project from assignment to finish
D. Start late and finish late

17. How would you like a project to be assigned?

A. I would like the complete project assigned early with one final due date.

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B. I would like the complete project assigned early with parts of the project due over the course of the assignment period.
C. I would like the complete project assigned in parts with individual due dates for the parts over the assignment period.
D. I would like the complete project assigned in parts with one due date for the entire project.

18. When assigned a course project:
A. I immediately make a game plan to evenly distribute the work over the assignment period.
B. I talk to my classmates to see how they are going to approach the project.
C. I put off the project until the due date gets really close.
D. I immediately complete the project so I no longer have to worry about it.

19. Do project due dates cause you extra stress?
A. No, because I usually get them done in time so the due date does not bother me.
B. No, because I am used to handling multiple responsibilities at one time.
C. Yes, because I wait until the last minute to work on the project.
D. Yes, because I am not good at managing my time.
E. Other

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METHOD	One submission deadline, no suggested intermediate subtask deadlines	One submission~~suggested~~ deadline, suggested intermediate subtask deadlines	Intermediate subtask deadlines	All
Students Completing Project	32	129	67	228
Mean of PROJECT_SCORE	78.619	86.120	79.137	83.026
Mean of KNOWLEDGE_GAIN	Not Collected	34.563	30.646	33.189

Table 1 - Performance Measures by METHOD Level

METHOD		One submission deadline, suggested intermediate subtask deadlines	Intermediate subtask deadlines	All
Responses to "Did the database project due date cause you extra stress?"		% within this method	% within this method	% of total
(1) No extra stress because I usually get projects done in time	Actual Expected	32% 30%	27% 30%	30% 30%
(2) No extra stress because I am use to handling multiple responsibilities	Actual Expected	32% 33%	35% 33%	33% 33%
(3) Yes extra stress because I wait until the last minute to work on the database project	Actual Expected	12% 13%	15% 13%	13% 13%
(4) Yes extra stress because I am not good managing my time	Actual Expected	5% 6%	6% 6%	6% 6%
(5) Other	Actual Expected	19% 18%	17% 18%	18% 18%
Total	Actual Expected	100% 100%	100% 100%	100% 100%

Table 2 – PROJECT_ANXIETY responses by METHOD Level

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Survey		Pretest tend to complete projects	Posttest completed database project
		% within this survey	% within this survey
(1) Start early and finish early	Actual Expected	25% 18%	12% 18%
(2) Start early, procrastinate, and finish on time	Actual Expected	34% 37%	39% 37%
(3) Work steadily on the project from assignment to finish	Actual Expected	29% 31%	32% 31%
(4) Start late and finish late	Actual Expected	12% 14%	17% 14%
Total	Actual Expected	100% 100%	100% 100%

Table 3 – Approach to Project Completion by Pretest and Posttest

Survey		Pretest tend to complete projects	Posttest completed database project
		% within this Survey	% within this survey
(1) Start early and finish early	Actual Expected	33% 22%	11% 22%
(2) Start early, procrastinate, and finish on time	Actual Expected	48% 48%	48% 48%
(3) Work steadily on the project from assignment to finish	Actual Expected	11% 21%	31% 21%
(4) Start late and finish late	Actual Expected	8% 9%	10% 9%
Total	Actual Expected	100% 100%	100% 100%

Table 4– Approach to Project Completion by Pretest and Posttest Only for METHOD of Intermediate Subtask Deadlines

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Survey		Pretest before completing database project	Posttest after completing database project
		% within this survey	% within this survey
(1) I would like the complete project assigned early with one final due date.	Actual Expected	31% 25%	18% 25%
(2) I would like the complete project assigned early with parts of the project due over the course of the assignment period.	Actual Expected	33% 38%	44% 38%
(3) I would like the complete project assigned in parts with individual due dates for the parts over the assignment period.	Actual Expected	26% 28%	30% 28%
(4) I would like the complete project assigned in parts with one due date for the entire project.	Actual Expected	10% 9%	8% 9%
Total	Actual Expected	100% 100%	100% 100%

Table 5 - How Students Want Projects Assigned by Pretest and Posttest

Survey		Pretest before completing database project	Posttest after completing database project
		% within this survey	% within this survey
(1) No, because I usually get them done in time so the due date does not bother me.	Actual Expected	27% 29%	30% 29%
(2) No, because I am used to handling multiple responsibilities at one time.	Actual Expected	40% 37%	33% 37%
(3) Yes, because I wait until the last minute to work on the project.	Actual Expected	11% 12%	13% 12%
(4) Yes, because I am not good at managing my time.	Actual Expected	12% 8%	5% 8%
(5) Other,	Actual Expected	10% 14%	19% 14%
Total	Actual Expected	100% 100%	100% 100%

Table 6 – PROJECT_ANXIETY by Pretest and Posttest

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METHOD		One submission deadline, suggested intermediate subtask deadlines	Intermediate subtask deadlines
		% within this method	% within this method
(1) Two of three days before the project deadline.	Actual Expected	20% 18%	14% 18%
(2) One day before the project deadline.	Actual Expected	45% 47%	50% 47%
(3) The day the project was due.	Actual Expected	19% 24%	35% 24%
(4) I did not complete the project.	Actual Expected	16% 11%	1% 11%
Total	Actual Expected	100% 100%	100% 100%

Table 7 - When Students Finished Project by METHOD Level