

Procrastination and Performance in Computer Information Systems Courses

Leah A. Schultz
lschult@tarleton.edu

Jason H. Sharp
jsharp@tarleton.edu

Marketing and Computer Information Systems
Tarleton State University
Stephenville, TX 76401, USA

Abstract

This study takes an initial look at student perceptions about procrastination in their computer information systems courses. Students responded to survey questions that asked about their personal level of procrastination, potential consequences of procrastinations, reasons for procrastination, and also things that might help them overcome procrastination. Seventy six students enrolled in online Computer Information Systems classes responded to these questions as well as two open ended questions about procrastination. After analysis of results, there were trends in the data that indicated that students procrastinated for a variety of reasons. There were only small differences in responses of demographic groups including gender, age, and major. Discussion included potential things that faculty members may want to consider to mitigate procrastination in students and the paper discusses the next steps in this research project which aims to study relationships between performance and procrastination as well as factors such as online education that also may affect a student's tendency to procrastinate.

Keywords: Procrastination, Study Skills, Performance

1. INTRODUCTION

"Procrastination always gives you something to look forward to." ~ Joan Konner

"Never put off until tomorrow what you can do the day after tomorrow" ~ Mark Twain

A common refrain heard among faculty in higher education is, "Why do students wait until the last minute to start on assignments?" On the other hand, students often justify their untimely actions by declaring, "I work better under pressure!" Procrastination among students is certainly not a new phenomenon (e.g., Ellis & Kraus, 1977; Hill, Hill, Chabot, & Barrall, 1978) or one that is going away any time soon. Over

the course of some thirty years of research in the area of procrastination, many antecedents have been identified across multiple disciplines for both face-to-face and online instruction.

This study seeks to gain a better understanding of why students in Computer Information Systems (CIS) courses, in particular, procrastinate on homework assignments and to identify the consequences of this procrastination. For the purposes of this study, the authors focus upon academic procrastination as defined by Steel and Klingsieck (2016) as "to voluntarily delay intended course of study-related action despite expecting to be worse off for the delay" (p. 37).

The ultimate goal is to understand more fully what causes students to procrastinate and to identify implication that respond to any findings of the study. For example, if students indicate a certain reason for procrastinating, such as being overwhelmed by the material, then that finding might implicate the use of different teaching strategies to mitigate the problem.

2. LITERATURE REVIEW

Antecedents

There is certainly no shortage of research on academic procrastination across various disciplines in higher education: e-learning (You, 2015), statistics (Dunn, 2013), and psychology (Ferrari & McGowan, 2002; Moon & Illingworth, 2005; Steel & Klingsieck, 2016) just to name a few. Not surprisingly, within the wealth of literature related to academic procrastination a long list of antecedents have been identified including: anxiety, conscientiousness, fear of failure, lack of interest, locus of control, low energy, motivation, neuroticism, perfectionism, shame and guilt, self-control, task avoidance, and time management (Brownlow & Reasinger, 2000; Dunn, 2013; Fee & Tangey, 2000; Haycock, Klassen, Krawchuk, & Rajani, 2008; McCarthy, & Skay, 1998; Onwuegbuzie, 2000; Schouwenburg & Groenewoud, 2001; Steel & Klingsieck, 2016; Waschle, Allgaier, Lachner, Fink, & Nuckles, 2014).

Self-Regulation

Recently, the impact of self-regulation on academic procrastination has become a popular area of study (e.g., Dunn, 2013; Klassen, Krawchuk, & Rajani, 2008; Pedrosa, Cravino, Morgado, & Barreira, 2016; Waschle et al., 2014; Wolters, 2003). As noted by Steel and Klingsieck (2016), "whatever new antecedents are revealed, all studies consistently conclude that failures in self-regulation are the core of academic procrastination" (p. 38). Although, the study of self-regulation as it impacts learning is not novel (e.g., Zimmerman, 1986), more recently the topic of academic self-regulation has emerged. Wolters (2003) asserted that "students who frequently procrastinate stand in stark contrast to students characterized as self-regulated learners" (p. 179). The overall argument is that self-regulated learners possess a greater degree of understanding how to use various strategies to enhance learning, greater metacognitive skill, and greater motivational beliefs and attitudes. In relation to motivational beliefs and attitudes, self-efficacy has also been shown to be a significant antecedent of whether

students are more inclined to procrastinate or not. The idea being, if a student does not have confidence in their ability to do something, they have a tendency to put it off. In sum, the expectation is that self-regulated learners are less likely to procrastinate (Klassen et al., 2008; McCarthy & Skay, 1998; Wolters, 2003).

Online Instruction

Also notable, with the increase in online programs, is the steady stream of research on academic procrastination as it relates to online instruction (e.g., Delaval, Michinov, Le Bohec, & Le Henaff, 2017; Doherty, 2006; Dunn, 2013; Elvers, Polzella, & Graetz, 2003; Khiat, 2017; Klingsieck, Fries, Horz, & Hofer, 2012; McElroy & Lubich, 2012; Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011; Moon & Illingworth, 2005; Levy & Ramim, 2012). While it is quite clear from the research that academic procrastination is alive and well in traditional face-to-face courses, the greater degree of flexibility and lesser degree of accountability in online courses potentially exacerbates the issue of academic procrastination. Because of this, the design of online courses becomes even more important (Paden & Stell, 1997). Because many online courses require group collaboration, Sharp and Sharp (2016) recommended that "online instructors should attach due dates to each of the individual components of a scaffolded collaborative task as a support mechanism for student's time management" (p. 65). Beyond, the use of deadlines only, Humphrey and Harbin (2010) found that incorporating rewards related to deadlines resulted in less procrastination.

Computer Information Systems Courses

While the research on academic procrastination is vast, its examination in CIS courses, in particular, is somewhat lacking. While not specifically studying procrastination, Sharp and McAdams (2013) found that student use of professor-created videos in a Visual Basic programming course reached more than "50% on the specific day assignments were due each week" suggesting that students "were potentially waiting till the last minute" to get started on assignments (p. 4). In another study, Humphrey and Schwieger (2013) examined the impact of due date frequency on student performance, learning, and anxiety in an Introduction Management Information Systems (MIS) course. In terms of procrastination, the study found that students assigned required subtask deadlines "finished the project by the due date at higher rates than students with suggested intermediate subtask deadlines" (p. 9); however, students

assigned required intermediate subtasks deadlines "started their projects later than they typically start projects while the students with suggest intermediate subtask deadlines started their database project at the same time they typically start projects" (p. 9). The authors conclude by recommending that to "enhance student performance and learning while minimizing negative procrastination, faculty should consider the value of incorporating suggest subtask deadlines into project descriptions" (p. 9).

By building upon the previous literature, this study will look specifically at students in various CIS courses utilizing student activity data collected Blackboard. This data in conjunction with previous studies and the data collected in this study on attitudes toward procrastination will help us determine how procrastination affects our CIS students and inform us about ways to potentially curb this behavior.

3. METHODOLOGY

This first phase of this proposed research project was to collect self-reported information from students in Computer Information Systems classes about opinions and experiences with procrastination. Students in three online courses during the summer semester were asked to participate in a short online survey consisting mostly of demographic information and statements regarding attitudes towards procrastination. These statements asked students to respond to statements using a Likert scale that assessed their own behavior in procrastinating, their potential reasons for procrastinating, and finally potential deterrents to procrastinating. In addition to these questions, students were asked two open ended questions that allowed them to provide additional information on potential reasons for procrastinating as well as strategies or ideas in helping avoid procrastination. Students that completed the survey were offered extra credit in the course for their participation.

Students were asked demographic questions including gender, age, classification (freshman, sophomore, etc.) and major. After completing this section, students responded to the following statements using a 10 point Likert scale with 1 being "Completely Disagree" to 10 being "Completely Agree". Students selecting a value of 5 indicated a Neutral response, neither agreeing or disagreeing.

- Q1. I often wait until the last minute to complete assignments in my class.
- Q2. I read an assignment once it's posted to determine when I need to start.
- Q3. I care about the grades I receive in my classes.
- Q4. I complete assignments before the due date.
- Q5. I manage my time well.
- Q6. I often do not turn in work at all due to procrastination.
- Q7. I often receive lower grades because I procrastinate.
- Q8. I produce higher quality work when I do not procrastinate.
- Q9. I often turn in low quality work due to my procrastination.
- Q10. Procrastination causes me anxiety and stress in my classes.
- Q11. I would be a better student if I did not procrastinate.
- Q12. I procrastinate because I work better under pressure.
- Q13. I procrastinate on assignments because I do not find them interesting.
- Q14. I procrastinate on assignments because I would rather do something else.
- Q15. I procrastinate on assignments because I do not understand the material.
- Q16. I procrastinate on assignments because they don't really matter that much.
- Q17. I am less likely to procrastinate if I am working in a group.
- Q18. I am more likely to procrastinate on assignments in classes that I do not enjoy.
- Q19. I am more likely to procrastinate on assignments in classes that are hard.
- Q20. I am more likely to procrastinate on assignments that I think are easy.

Students were then asked to provide additional information in open ended questions:

1. These are things that make it more likely that I will procrastinate:
2. These are things that help me not procrastinate:

Students responded to the survey online during a two period week. Results were collected and analyzed using STATA to provide a snapshot of students' views on procrastination.

4. RESULTS

Demographics Overview

Seventy six students responded to the survey during the semester. Of those 76 students, 52

were male and 24 were female. The students represented numerous majors across the university. Students were coded into two groups of major and non-majors. The major group included students from Computer Information Systems and Computer Science while the remaining students were placed in the non-major group. The majority of respondents to the survey fell in the age groups 18-24 and 25-44. Only seven students identified themselves in the 45+ age group. As a result of the low number of responses in this age group, their data was discarded when looking for relationships between demographic groups and their responses to the survey. Additionally, we collected information on classification but a similar distribution problem occurred and the data was not considered for analysis.

The data were analyzed to determine if relationships existed between the demographic data and the responses to the survey questions. Overall, there was little significant difference in responses when broken down into groups by gender, major, and age.

Gender

Data from all questions was analyzed using a Wilcoxon Signed Rank Test to determine if there was a statistically significant difference between the way male and female students answered the questions about procrastination. Only two questions produced significant results (Q11 & Q20). Female students were more likely to agree with the statement that they would be better students if they did not procrastinate than their male counterparts ($z=2.240$, $p=.0251$). Also, female students were less likely than male students to agree with the statement that they would procrastinate if they thought an assignment was easy ($z=-2.581$, $p=.0098$).

Major

Data was also analyzed using the Wilcoxon Signed Rank Test to determine if there were differences in responses of students majoring in information systems and computer science versus those students majoring in non-IT related majors.

On two questions regarding reasons for procrastination (Q13 & Q14), non-majors indicated they were more likely to procrastinate if they did not find the assignment interesting ($z=-2.675$, $p=.0075$) and also if they would rather do something else ($z=-2.355$, $p=.0185$).

Age

Due to the low response rate of students in the

45+ category, the only data that were analyzed consisted of students in the 18-24 range and students in the 25-44 range. Using the Wilcoxon Signed Rank test again to determine if there were significant differences in the way these two groups responded also resulted in significant differences on three questions (Q2, Q11, & Q14). Students aged 18-24 indicated they were more likely to read an assignment once it was posted than their 25-44 year old counterparts ($z=2.041$, $p=.0412$). Students aged 18-24 were also more likely to agree with the statement that they would be better students if they did not procrastinate ($z=2.228$, $p=.0259$). Finally, students aged 18-24 were more likely to indicate that they procrastinate because they would rather do something else.

Responses to Individual Items on The Survey

Across the instrument, there were high levels of agreement or disagreement on many of the questions. Questions where the median score was over 8 in agreement included the following questions: Q2, Q3, Q4, Q8, and Q11. There were high levels of disagreement (median <3) with statements Q6, Q7, and Q16. Other questions had responses medians that gravitated towards 5 indicating more neutral feelings about the statement.

5. DISCUSSION

The initial look at students' perceptions on procrastination indicate a wide variety of responses to the questions. The initial questions on the survey were intended to have respondents self-evaluate how much they actually procrastinate in their classes and how well they manage their time. In the responses to these questions, it appears that this group of respondents believe they manage their time very well. 71% of respondents agreed (responses in 6-10 range) that they manage their time well and an even higher percentage of 76% indicate that they complete assignments before the due date. Many appear to be proactive and do not admit to high levels of procrastination. As a result, most of the questions that deal with the consequences of procrastination such as lower grades or lower quality work, have little impact on these respondents because, according to them, they rarely suffer these consequences.

The next set of questions on the survey were intended to have students indicate things that might lead them to procrastinate. In this

section, there was quite a bit of variety in responses with many of them having a median score around the neutral mark. The most strongly item disagreed with in this section is that students do not procrastinate because they think the assignments don't really matter. This potentially relates back to a high level of concerns for grades referenced back in question 3.

The final set of questions was geared towards possible aides or hurdles in the nature of the assignments themselves. Students were asked if various aspects such as group work or enjoyment tended to affect their likelihood in procrastinating. Again, the medians tended towards the neutral level of 5, with no one aspect outstanding.

What these results show overall about this set of students is that procrastination has little effect on their work in the courses that were studied. There were some differences between gender or age but there was very little evidence to indicate strongly that attitudes towards procrastination in this group was not heavily influenced by demographics.

The importance of understanding how students approach their learning and what barriers they might encounter allow educators to potentially discover strategies to assist students in avoiding procrastination. So to look further at the data that was gathered, we could potentially recommend strategies that may provide further insight or help us create pedagogical responses to the findings presented. Across the different groups, there were some findings that educators may use to guide the way assignments are created and deployed. For example, if non-majors tend to procrastinate more on assignments that they did not find interesting, faculty teaching survey courses that have higher numbers of non-majors, might look a little harder at the "interesting" or "enjoyment" aspect of the assignment. Perhaps programming assignments could relate to something going on around campus that seems more relatable or perhaps cases used could be topics that appeal to students in the class. So instead of assigning a web design project for a local coffee shop, perhaps students could be encouraged to design a marketing site for a buzzworthy movie or television show.

Additionally, 63% students indicated that they sometimes procrastinate because they would rather do something else. While students that

procrastinate will always be able to find something else they would rather do, perhaps faculty can be more strategic in planning due dates and assignment deployment. For example, if homecoming activities on a campus consume a lot of student time, perhaps faculty could consider scheduling due dates around these activities that are likely to encourage students to put off their work until a later time. Putting due dates before these events or at least towards the beginning of these events might encourage students to get the work done before more distractions are available.

From the open ended questions, there were themes and some recommendations that students had that were not considered in the survey which might be included on future iterations of the survey. Seven students mentioned that long lead times before a due date were more likely to cause them to procrastinate. Conversely, there were two students that indicated having access to all of the assignments at once allowed them to manage their time better. Another student recommended smaller, more frequent assignments that would discourage procrastination.

Another theme that appeared in multiple open ended responses had to do with the amount of reading required for the assignment. Five students indicated that they were more likely to procrastinate if there were large amounts of reading to be done. While this may vary by subject or course being taught, faculty members may wish to balance reading assignments along with deliverables.

There are other things mentioned throughout that students indicate as helpful in avoiding procrastination. Students say that frequent reminders of due dates help them procrastinate less. They also say that detailed, explicit instructions are needed to help them avoid starting work on assignments.

There are many distractions that students mentioned that are more likely to result in late or delayed work. Faculty members, like students, have little control over things like work schedules, family obligations, and such. Students report that burnout and simultaneous heavy workloads across courses also contribute to procrastination. In smaller departments, faculty may consider collaboration on schedules if possible to avoid all assignments or exams taking place on the same day.

Another distraction mentioned by four students is social media. Faculty may want to consider where materials and instructions are being delivered. There have been studies about faculty trying to incorporate various forms of social media into their teaching strategies but this may need to be considered carefully before implementation if it will only result in additional distraction and procrastination.

6. LIMITATIONS

This survey was intended to gather some initial data on how students perceive procrastination in their CIS courses. The study is limited in that the response rate is fairly low, resulting in some data that could not easily be studied due to sample size. Another factor that limits this initial study is the fact that data were collected during a summer session where the timeline for completing a course is shortened. It is possible that this shortened timeline of due dates and expectations affected the data collected. Students might be less likely to procrastinate during the summer session when there are smaller gaps between due dates or they might be more likely to procrastinate due to larger chunks of reading needing to be completed in a shorter amount of time. Certain types of students that are less prone to procrastination might be more likely to enroll in summer classes for some of these reasons as well. To make this study stronger, more data needs to be collected and that data needs to be drawn from long semesters as well as the summer session.

An additional potential limitation for this study is the fact that data were collected from online courses only. The nature of an online class can differ significantly from the teaching environment of a face to face class and procrastination could be more prevalent in one environment over another. As mentioned previously, some students said that frequent reminders helped them not procrastinate. It might be that more reminders are being given on the fly in a face to face environment as opposed to a faculty member remembering to post announcements and reminders about due dates throughout the semester.

The survey itself may need revision in future iterations. Some of the reasons for procrastination on the survey were pulled from surveys completed by previous studies and could be expanded to include additional items discovered in the first application of this survey.

Items such as frequent reminders, due dates, reading assignments, and work/school balance could be further explored with specific questions.

7. FUTURE RESEARCH

As mentioned earlier, this survey is the first step in a larger look at procrastination in computer information systems courses. The data collected using this instrument indicated the students' thoughts and even their self-perceptions which might not always be accurate. The next phase in this research is to match those perceptions with reality and also look at performance in relation to procrastination. Data is currently being collected that will evaluate when an assignment is turned in and how a student's grade varies based on how long a student waits to submit it. For example, we intend to study if there is a difference between grades for students that submit days in advance versus students that submit one hour before the deadline.

Once we have collected that data and collect additional survey data, we also intend to study some of the limitations of this first iteration. We would like to study how the online environment might encourage or discourage students from procrastinating. We also think it is important to look at differences such as overall length of course (summer courses vs. long semesters) and finally, try to determine if there are differences in lower level courses where study skills might be weaker compared to upper level courses where one hopes that study skills have improved.

The ultimate goal of this research will be to identify how procrastination is affecting students in computer information systems. Once that picture becomes clearer, we can then develop and test strategies to help students be more successful and provide them with better skills to avoid procrastination in their academic life as well as their professional careers.

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