Does The Early Bird Really Get The Grade?

D. Veena Parboteeah, PhD
Eastern New Mexico University
College of Business
ENMU Station 49, 1500 S Ave K, Portales NM 88130
USA

Deborah A. Corbin, DBA
Eastern New Mexico University
College of Business
ENMU Station 49, 1500 S Ave K, Portales NM 88130
USA

Abstract

This study analyzes different personal characteristics of students in an online class that may impact their individual success in a course. In particular, does procrastination impact a student's performance? To aid in student success, the instructor needs to understand what may impact a student's success. While student characteristics related to success are predominately similar in online and face-to-face courses, online learning is different than face-to-face learning and there are certain personal characteristics that may affect online students more than face-to-face students. The results of this study provide evidence that procrastination is negatively correlated to student performance and that there are differences in the performance of procrastinators based on gender and age.

Keywords: student performance; procrastination; online learning; academic success; graduate student

1. Introduction

Researchers and academics have continuously sought to understand what contributes to student success in the classroom. With the Internet revolutionizing our education system, there is also a pressing need to understand student success in this new medium. Much research has shown that many factors of student success are similar between face-to-face classes and online classes, such as college GPA (Bernard, Brauer, Abrami, & Sturkes, 2004; Wladis & Samuels, 2015; Wojciechowski & Bierlein-Palmer, 2005) and demographics (Jones, 2010; Wladis, Hachey, & Conway, 2015). However, there are differences between online classes and face-to-face classes. In the traditional classroom, most of the time is spent with lectures administered by an instructor, with the students being passive participants in this interaction (Schwerdt & Wuppermann, 2009). With online education, there is a definite shift from this approach to a self-learning approach, where the students assume the responsibility of learning the material (Volery & Lord, 2000), with the instructor being a facilitator.

Technology, instructor, and student characteristics have been identified as the three main variables that affect student success in online education (Leidner & Jarvenpaa, 1993). The focus of this study is on student characteristics that lead to student success. Highly motivated and self-disciplined students have been found to excel in the online course environment (Leidner & Jarvenpaa, 1995) as online education requires students to assume greater responsibility for learning the course material (Volery & Lord, 2000). Students who are less motivated or not as disciplined may not be successful in online courses. This study seeks to understand whether procrastination impacts graduate students' performance in an online course. Students who enroll in a course early may be considered highly motivated and disciplined. In fact, when students finalized enrollment procedures has been used as a proxy for procrastination (De Paola & Scoppa, 2015). Is the performance of early registrants better than procrastinators?

Gender is a student characteristic that has been identified as being predictive of student success in some studies (Kaighobadi & Allen, 2008), but other studies have found no difference as a result of gender (Wladis, Hachey, & Conway, 2015; Wojciechowski & Bierlein-Palmer, 2005). Similarly, conflicting results have been found for the relationship between age and student success. Age and gender are also analyzed for their relationship to student success. The identification of student characteristics that may impact success can aid instructors in implementing practices that will positively impact student success in graduate courses.

Following is a review of the literature related to student characteristics and student success and the proposed hypotheses. Then an overview of the methodology and the results of the study are provided with a review of the limitations. Finally, future research opportunities are presented.

2. Literature Review

Online education has been defined as any class that provides learning resources in an online delivery mode that is enabled by the Internet, thereby allowing students access to these resources at any time, regardless of their geographic location (Harasim, Hiltz, Teles, & Turoff, 1995). It has become more popular in recent years because of the advantages such an environment provides to the students. The main advantage is the flexibility and convenience offered given that the students have access to the class materials anytime and anywhere (Harasim et al., 1995). No longer do the students have to commute to a campus to sit in a classroom for a predetermined length of time. The students can thus retrieve the information they need when they need it more effectively. Unlike the traditional classroom, the students have time to review the class materials and reflect on their responses before responding to discussions (Harasim et al., 1990).

A variety of measures are used to gauge the performance of students in online classes. These include objective measures as well as subjective measures. Objective measures include scores on assignments and tests, completion of individual and group projects, and completion of a course (Picciano, 2002). Studies of student performance also rely on subjective measures, which are based on the students' perceptions of learning (Picciano, 2002). These measures focus on how well or how much knowledge the students have acquired by taking an online course and include perceived learning outcomes and student satisfaction (Alavi, Wheeler, & Valacich. 1995). Typically, subjective measures are based on questions about broad concepts and have been shown to suffer from systematic biases, such as psychological factors (Bertrand & Mullainathan 2001). Consequently, the use of objective data, if it exists, is preferable (Jahedi & Méndez, 2014). For that reason, in this study, we use an objective measure of procrastination (when students registered in the course) and performance (final grades in the course).

Next, based on a review of literature, the influence of procrastination, gender, and age on student performance is discussed and specific hypotheses are proposed.

2.1. Procrastination

The relationship between student procrastination, the lack of self-regulated performance, and student success in the classroom has been the focus of several studies. Procrastination has been found to negatively impact academic performance and is a greater problem in online classes than face to face classes (Elvers, Polzella, & Graetz, 2003; Jackson, Weiss, Lundquist, & Hooper, 2003). Online students indicated that more discipline and independence is required in an online class than a face to face class in a survey administered to undergraduate and graduate students at one university (Fish & Snodgrass, 2016). Waschull (2005) found that self-discipline and motivation were predictive of success in an online psychology course. Another study also found that students' opinions about self-direction, self-management, and initiative were found to be predictive of their academic success in an online course (Bernard et al., 2004).

De Paola and Scoppa (2015) studied the relationship between when students finalized enrollment procedures for an Italian university, a proxy for procrastination, and grades. Correlations were found between when students finalized enrollment procedures and high school grades and the average grade of exams taken during the first two years of university resulting in the finding that procrastinators have lower grades. In addition, a correlation was found between when students finalized enrollment and the number of credits completed within the first two years of study and over the students' academic careers. Tice and Baumeister (1997) also found that procrastinators received lower grades in a study where procrastinators were identified by both a general procrastination scale and when papers were submitted. A general procrastination scale was also used by Jiao, DaRos-Voseles, Collins, and Onwuegbuzie (2011) in their study which found that cooperative learning groups in a graduate course with high levels of procrastination based on their responses to the scale had lower levels of performance.

H1a: Procrastination is negatively correlated to student performance.
H1b: The performance of early registrants is better than that of late registrants.

2.2. Gender

Several studies have examined the relationship between gender and student performance, but conflicting results have been found. For instance, Jones (2010) researched the relationship of student demographics, including gender, and student performance based on a sample of students taking an introductory computer class at a community college. A surprising result of the study was that "demographics are not significant predictors of student performance in either seated or online environments" (Jones, 2010, p. 71). Volery and Lord (2000) found that gender was not predictive of teaching effectiveness. Further, success rates were equal for gender in online STEM classes (Wladis, Hachey, & Conway, 2015). Similarly, Wojciechowski and Bierlein-Palmer (2005) found that female students are more attracted to the online environment, but no significant relationship was found between gender and final grade.

According to Rovai and Baker (2005), women have been historically targeted for online learning because of the communication differences in gender that make online learning more appealing and convenient to females. Further, it has been found that female students succeed in the asynchronous online environment (Jones, 2010) and are more likely to participate in online discussions (Arbauch, 2000; Herring, 2000). Ross and Powell (1990) found that online learners were mostly female and women scored up to 20 percentage points over men in areas of applied studies, humanities, sciences, and social sciences. Similarly, Kaighobadi and Allen (2008) found that female students typically have higher GPA than male students.

The relationship between gender and procrastination has been extensively studied, with mixed results. For instance, Lai, Badayai, Chandrasekaran, Lee, and Kulasingam (2015) found that there were no differences in procrastination by gender. Similarly, Varma (2017) reported that male and female students in professional courses did not differ in their procrastinating behavior. Steel (2007) found a weak relationship between gender and procrastination. In contrast, a significant difference has been found in procrastination by gender (Sepehrian & Lotf, 2011; Steel & Ferrari, 2012). More specifically, males tend to procrastinate more than females (Balkis & Duru, 2009; Khan, Arif, Noor, & Muneer, 2014; Özer, Demir, & Ferrari, 2009; Van Eerde, 2003; Wazid, Shahnawaz, & Gupta, 2016). These results are attributed to the fact that males are open to risk taking and revolt against control (Kamboj, 2018). Therefore, we hypothesize that male students procrastinate more and as a result, there is a difference in their performance.

H2a: Male students procrastinate more than female students.
H2b: Female students will perform better than male students.

2.3. Age

The relationship between age and student performance has been studied extensively. For instance, Wojciechowski and Bierlein-Palmer (2005) found age to be a predictor of student grades. There was a correlation between academic success and older students (Kaighobadi and Allen, 2008; Wladis, Hachey, & Conway, 2015). In a study by Kimmel, Gaylor, & Hayes (2016), three age groups were identified: 24 and under, 25 to 34, and 35 and over. The results of their study supported the hypotheses that there are differences between age groups of motivations for seeking higher education. Participants 35 and over were more likely to pursue higher education due to a desire for pay increase or a new career, or to gain more respect from their peers while participants 24 and under were more likely to pursue higher education due to their parents. Knowles' (1978 through Kimmel, Gaylor, & Hayes, 2016) theory of andragogy posits that self-directedness, interaction, desire to achieve, and application of learning increases as individuals' concepts of self, orientations and readiness to learn, and experiences change with maturity.

The relationship between age and procrastination has been studied with mixed results. On one hand, there is a negative relationship between age and procrastination (Beswick, Rothblum, & Mann, 1988; Prohaska, Morrill, Atiles, & Perez, 2000; van Eerde, 2003). On the other hand, other researchers have reported no relationship between age and procrastination (Haycock, McCarthy, & Skay, 1998; Howell, Watson, Powell, & Buro, 2006).

People typically procrastinate less as they age and learn (Steel, 2007). According to O'Donoghue and Rabin (1999), as we get older, we develop better schemes to deal with procrastination. For instance, older students will have better time management skills than younger students. Therefore, we hypothesize that older students have better coping mechanisms than younger students and their performance will not be affected by procrastination, unlike younger students.

H3a: Younger students procrastinate more than older students.
H3b: Older students perform better than younger students.

3. Method

The sample consists of students enrolled in a MBA accounting class which is part of a fully online program at a regional public university in Southwestern United States. The class is a required class for the MBA and is generally one of the initial courses taken in the MBA program as it is a prerequisite for other courses. The sample was obtained from two fall semesters in which the course was taught by the same instructor. The combined attrition rate for these two classes was 0.06%, which is considerably smaller than reported rates for online courses (Ellram & Easton, 1999). 132 participants contributed to this study. 57 participants were women (43.2%), and 75 were men (56.8%). The mean age of the sample was 32.68 (SD=7.88), and it ranged between 22 and 58.

The age and gender for each of the students were retrieved from the university's student database. According to Dimock (2018), any individual born between 1981 and 1996 (ages 22 to 37 in 2018) is considered a Millennial, while any individual born from 1997 onward is considered a post-Millennial. We use this categorization in our study.

According to De Paola & Scoppa (2015), when students finalized enrollment procedures can be used as a proxy for procrastination. Registration for the fall semester started on April 3 in 2016 and April 2 in 2017. The fall semester started on August 16 in 2016 and August 22 in 2017. Students can register into classes up to a week after the start date of the semester. The registration period was 135 days for 2016 and 142 days for 2017. Students who enroll early are more conscientious and plan their registration early (Williams, 2013). The number of days before the semester that the students registered in the class is used as a continuous variable for procrastination. Early registration is defined as registration occurring before July 1, which marks about two-thirds of the registration period and the halfway point of the summer semester.

The dependent variable in this study is student performance which is being measured by the student's midterm and final score. We use the score at midterms to determine whether intervention strategies can be implemented after midterm grades are posted.

4. Data Analysis and Results

Hypothesis 1a examined the relationship between procrastination and performance. The correlation between procrastination and midterm score was -0.17 while that between procrastination and final score was -0.19. Using both the midterm and final score as a dependent variable, we find a negative relationship between procrastination and student performance, providing support for Hypothesis 1a.

Hypothesis 1b tests the effect of procrastination on performance. The results show that early registrants ($M = 0.93$, $SD = 0.05$) outperformed the late registrants ($M = 0.90$, $SD = 0.12$), $t(109) = 2.24$, $p = 0.0135$ using the midterm scores. Similarly, early registrants ($M = 0.93$, $SD = 0.05$) outperformed the late registrants ($M = 0.89$, $SD = 0.14$), $t(101) = 2.46$, $p = 0.0077$ using the final scores. Therefore, the results provide support for Hypothesis 1b.

Hypothesis 2a determines whether procrastination differs by gender. The results show that male students ($M = 53.92$, $SD = 50.00$) did not procrastinate more than female students ($M = 56.25$, $SD = 52.09$), $t(118) = -0.26$, $p = 0.7960$. Thus, the results do not provide support for Hypothesis 2a.

Hypothesis 2b determines whether performance differs by gender. The results show that female students ($M = 0.91$, $SD = 0.07$) did not perform better than male students ($M = 0.91$, $SD = 0.12$), $t(123) = -0.04$, $p = 0.4845$ using the midterm scores. Similarly, female students ($M = 0.92$, $SD = 0.06$) did not perform better than male students ($M = 0.90$, $SD = 0.14$), $t(111) = -0.98$, $p = 0.1638$ using the final scores. Thus, the results do not provide support for Hypothesis 2b.

Based on the results for Hypotheses 2a and 2b, we further investigated whether there was a difference in performance between early registrants and late registrants by gender. The results show that for male students, the early registrants (M = 0.93, SD = 0.05) did not perform better than the late registrants (M = 0.90, SD = 0.15), t(60) = 1.38, p = 0.0870 when using the midterm scores. However, for male students, the early registrants (M = 0.93, SD = 0.05) performed better than the late registrants (M = 0.88, SD = 0.17), t(60) = 1.38, p = 0.0870 when using the final scores. When using the midterm scores for the female students, the early registrants (M = 0.93, SD = 0.05) performed better than the late registrants (M = 0.89, SD = 0.08), t(53) = 2.17, p = 0.0170. Similarly, for the female students, the early registrants (M = 0.94, SD = 0.04) performed better than the late registrants (M = 0.90, SD = 0.07), t(52) = 1.98, p = 0.0266 when using the final scores. We discuss these results in the next section.

Hypothesis 3a determines whether procrastination differs by age. The results show that post-millennials (M = 52.65, SD = 50.29) did not procrastinate more than millennials (M = 63.85, SD = 51.00), t(40) = 1.01, p = 0.1584. Thus, the results do not provide support for Hypothesis 3a.

Hypothesis 3b examines the relationship between age and student performance. The results show that post-millennials (M = 0.91, SD = 0.11) did not perform better than millennials (M = 0.92, SD = 0.07), t(59) = 0.48, p = 0.3156 using the midterm scores. Similarly, post-millennials (M = 0.92, SD = 0.12) did not perform better than millennials (M = 0.91, SD = 0.07), t(69) = 0.67, p = 0.2540 using the final scores. Thus, the results do not provide support for Hypothesis 3b.

Based on the results for Hypotheses 3a and 3b, we further investigated whether there was a difference in performance between early registrants and late registrants by age. The results show that for millennials, the early registrants (M = 0.93, SD = 0.05) did not perform better than the late registrants (M = 0.91, SD = 0.10), t(13) = 0.62, p = 0.2725 when using the midterm scores. Similarly, the results show that for millennials, the early registrants (M = 0.92, SD = 0.05) did not perform better than the late registrants (M = 0.91, SD = 0.10), t(13) = 0.52, p = 0.3072 when using the final scores. When using the midterm scores for the post-millennials, the early registrants (M = 0.93, SD = 0.05) performed better than the late registrants (M = 0.89, SD = 0.13), t(95) = 2.18, p = 0.0157. Similarly, for the post-millennials, the early registrants (M = 0.94, SD = 0.05) performed better than the late registrants (M = 0.89, SD = 0.14), t(88) = 2.49, p = 0.0074 when using the final scores. We discuss these results in the next section.

5. Discussion and Conclusions

The purpose of this study was to analyze different personal characteristics of students that may impact their success in an online graduate class. We used both the midterm and final scores to determine when intervention strategies should be implemented to aid in student success. We found a negative relationship between procrastination and student performance at midterms and the end of the semester. This finding is consistent with past research (e.g., Elvers, Polzella, & Graetz, 2003; Jackson et al., 2003). Further, the results show that early registrants outperformed the late registrants using both the midterm and final scores. (e.g., Jiao et al., 2011; Tice & Baumeister, 1997). These results are consistent with research indicating that graduate students who demonstrate procrastination tendencies also might have issues with self-regulation, such as managing their time to achieve results (Jiao et al., 2011).

Gender was not found to be a predictor of student performance both at midterms and finals. This result is consistent with the results of other studies that have found no difference as a result of gender (e.g., Wladis, Hachey, & Conway, 2015; Wojciechowski & Bierlein-Palmer, 2005). Further, no difference was found in procrastination by gender. The present finding is consistent with the results of previous studies (e.g., Lai et al., 2015; Varma, 2017). These results indicate that graduate students can be successful in online classes regardless of gender.

Based on these results, we also investigated whether there was a difference in performance between early registrants and late registrants by gender. The results show that for male students, the performance of early and late registrants did not differ at midterms, but their performance did differ at finals. In contrast, for female students, the performance of early and late registrants differed both at midterms and finals, with the early registrants outperforming late registrants. Future research should investigate these findings in depth, while also identifying interventions for late-enrolling students to help them be successful.

Age was not found to be predictive of student performance. This finding is in contrast with the results from previous studies where age has been found to be a predictor of student grades (e.g., Kaighobadi & Allen, 2008; Kimmel, Gaylor, & Hayes, 2016; Wladis, Hachey, & Conway, 2015; Wojciechowski & Bierlein-Palmer, 2005). This finding can be explained by Knowles' (1978 through Kimmel, Gaylor, & Hayes, 2016) theory of andragogy. Self-directedness, interaction, desire to achieve, and application of learning increases as individuals' concepts of self, orientations and readiness to learn, and experiences change with maturity. Graduate students pursue higher education due to a desire for pay increase or a new career (Kimmel, Gaylor, & Hayes, 2016) and as such, regardless of their age, they are motivated to be successful. Further, having successfully completed their undergraduate studies, graduate students have the skills necessary to be successful in their academic career. One of the limitations of our study was the fact that only 20.45% were post-millennials and the results may be biased because of the lack of homogeneity in age. Future research should examine the relationship between age and student performance in graduate courses with a more homogenous sample.

No difference was found in procrastination between millennials and post-millennials. This finding is consistent with the results from previous studies (Haycock, McCarthy, & Skay, 1998; Howell et al., 2006). Regardless of their age, graduate students enrolled in online courses develop schemes to deal with procrastination. One of the limitations of our study was the fact that only 20.45% were post-millennials and the results may be biased because of the lack of homogeneity in age. Future research should examine the relationship between age and procrastination in graduate courses with a more homogenous sample.

Based on these results, we also investigated whether there was a difference in performance between early registrants and late registrants by age. The results show that for millennials, early registrants did not perform better than late registrants. In contrast, for post-millennials, the performance of early and late registrants differed both at midterms and finals. Future research should investigate these findings in depth, while also identifying interventions for late registrants to help them be successful.

Support was not found for many of the hypotheses. This might be attributed to the small sample size, as well as the simplicity of our data analyses. One of the limitations of our study was the fact that only 20.45% were post-millennials and the results pertaining to age may be biased because of the lack of homogeneity in age. Further, per De Paola and Scoppa (2015), we used when students finalized enrollment procedures as a proxy for procrastination. Future research should examine the use of different measures for procrastination.

Several implications can be gleaned from this study. First, these results contribute to a program of research assessing the student characteristics that predict academic performance of graduate students in online courses. Second, the results support previous studies indicating that graduate students who demonstrate procrastination tendencies also might have issues with self-regulation, such as managing their time to achieve results (e.g., Jiao et al., 2011). Third, for male students, at the end of the semester, the early birds outperformed the procrastinators. Fourth, female early birds outperformed the female procrastinators both at midterms and finals. Finally, for post-millennials (any individual born from 1997 onward), early birds outperformed the procrastinators both at midterms and finals. Based on these results, interventions for procrastinators can be identified to help them be successful. Formative assessment measures throughout the semester might help reduce procrastination. Further, the goal for the instructor when administering an online course is to consistently keep the students engaged by interacting with them and building a relationship with them. Through providing feedback, promoting interactions, and showing a caring disposition, an instructor can engage students to perform better in online classes.

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