

The Switch: A Study of Promoting Introductory Managerial Accounting As the First Accounting Course for Business and Non-Business Majors

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Abstract

Low student performance in introductory accounting courses prompted the authors to switch the order of the courses and offer managerial before financial accounting. This decision to introduce students to the use of accounting information in business decision-making (the focus of managerial accounting) before teaching students to generate accounting information in the financial course is supported by the Pathways Commission's 2012 report, *Charting a National Strategy for the Next Generation of Accountants*. This paper presents our analysis of student performance as measured by the grades students earned in managerial and financial accounting for a three-year period before and after we switched to offering managerial as the first course in the accounting sequence. We looked at success and non-success measures for all students and then analyzed the grades for business and non-business majors separately. We found, inter alia, that our decision to offer managerial accounting before financial accounting resulted in improved student performance in the introductory course sequence.

Introduction

In Academic Year 2016-17, the accounting program at our university switched from offering financial to managerial as the first course in the introductory accounting sequence. We made this change in an attempt to improve student performance in both courses and in response to accounting practitioners' call for educators to make introductory accounting courses more relevant to students. We reasoned that students would perform better in both courses if they began their study with an understanding of the important role accounting plays in internal business decision-making. We called this change to offering managerial as the first course "The Switch." This paper presents our analysis of student performance as measured by the grades students earned during the three academic years before and after The Switch.

Background

The authors teach at a mid-sized public university in the southern United States. Approximately 8,000 students attend the university which has selective enrollment with admission standards that are not prohibitively high. We

draw students from across the United States and internationally (primarily from Nepal, India, and Europe). Many of our students come from suburban and rural areas, and 60 percent are female. In addition to our traditional, residential student body, our university has a large number of non-traditional and commuter students. Furthermore, many of our students work in addition to attending school, and a large number are first-generation college students.

Like many universities in the United States, our university has faced consistently high rates of D's, F's, and withdrawals (W's), collectively referred to as "DFW rates," in our two introductory accounting courses. For the Academic Year 2015-16, our DFW rate for the first accounting course, Introductory Financial Accounting, was 47.0 percent and our DFW rate for the second course, Introductory Managerial Accounting, was 32.5 percent. During that academic year, the three-credit-hour financial course served as a prerequisite for the three-credit-hour managerial course, and both were included in the business school's core curriculum.

In 2008, our university began facing dramatic reductions in state funding for higher education. As the reductions in funding reached over 40 percent, we also faced reduced student enrollment. As a result, our administration initiated a plan to increase both student enrollment and retention. This plan included identifying courses with high DFW rates that might serve as "road-blocks" to a student's completion of a degree. Each college program then developed individualized plans to improve student retention and address high DFW rates without sacrificing course quality. In accounting, we recognized that some factors attributing to our high DFW rates (such as the degree to which a student's prior education had prepared the student for college) were out of our control. However, we also recognized that other factors (such as the Pathways Commission's 2012 call for accounting educators to make introductory accounting more relevant to students) were within our control. We then considered how we could alter our introductory courses to make them more relevant to students and, thereby, reduce our DFW rates.

We began our review of the introductory accounting courses by examining which majors required the courses in their curriculum. We found that all business majors and three non-business majors (agribusiness, health care management, and mathematics/actuarial sciences) included both courses in their programs. In addition, we found that two non-business majors (construction management and unmanned aircraft systems management) required one accounting course. Similarly, a non-business major combined with a business minor (e.g., a kinesiology major with a management minor) required one accounting course.

Prior to the reduction in our state funding, we had offered a one-semester accounting survey course that combined financial and managerial concepts for those students whose majors required only one accounting course. However, with the budget reductions and the corresponding reduction in the number of accounting faculty lines, we could no longer offer the survey course. Because financial was a prerequisite to the managerial course, the programs that included just one accounting course essentially required their students to complete financial accounting. We then considered whether non-business students who were required to complete just one accounting course might benefit more from managerial than financial. We found that these majors focused on management and that their graduates would primarily use accounting information to make internal management decisions, which is the focus of managerial accounting. Therefore, we surmised that managerial would be a more relevant course for these students.

This conclusion led us to consider whether managerial might be the better course for all students to begin their study of accounting. We reasoned that students would benefit from first understanding how accounting information was used to make informed, internal business decisions before learning to prepare accounting information for external users, which is the focus of financial accounting. Specifically, we believed that students would relate better to managerial concepts such as purchasing materials to make a product and preparing labor budgets than to financial concepts such as listing a business' current assets on a balance sheet in the order of liquidity. Moreover, we anticipated that the managerial course would give students a general understanding of many accounting terms and calculations, thereby laying a foundation for the financial course.

Based on our determination that students would likely benefit from completing managerial before financial, we removed the financial prerequisite and modified the course numbering to reflect that managerial was the first course

in the accounting sequence. We then promoted for all students whose major required both introductory accounting courses to take managerial before financial. We called this curriculum change “The Switch.”

Literature Review

Etter, Burmeister, and Elder (2000) found that the average DFW rate for introductory accounting courses at four-year U.S. colleges was 40.8 percent. Since 2000, additional scholars have noted that their universities’ DFW rates for introductory accounting courses are consistent with the findings of Etter et al. (Jones, 2013; Kealey et al., 2005).

When addressing these high DFW rates, academic scholars have found that students, regardless of their major, do not appreciate how accounting information is used in decision-making and do not think that accounting will be relevant to their careers (Bartley, 2016; Braun & Sellers, 2012; Warren & Young, 2012). Scholars have also found that students have a negative perception of accounting, viewing it as technical, boring “number crunching” (Bartley, 2016; Bates, 2000; Mladenovic, 2000; Warren & Young, 2012). Scholars believe that the bookkeeping aspects of accounting discourage students in introductory accounting courses and that most students put forth only enough effort to merely pass these courses (Braun & Sellers, 2012; Jones, 2013; Mladenovic, 2000; Warren & Young, 2012).

For many years, accounting practitioners have called for a change in accounting education, including changes to the introductory accounting courses. In 1989, the American Accounting Association (AAA) appointed the Accounting Education Change Commission (AECC) to study and recommend changes to accounting education (Chiang et al., 2014; Stivers & Onifade, 2014). In 1992, recognizing that most students who took introductory accounting would not become accountants, the AECC advocated for a change in introductory courses to benefit the students who would enter business and government and make decisions using accounting information (AECC, 1992; Chiang, et al.; Duchac & Amoruso, 2012; Stivers & Onifade, 2014). The AECC found that this focus on decision-making should be combined with the traditional emphasis on preparing accounting reports (AECC, 1992; Duchac & Amoruso, 2012; Warren & Young, 2012).

In 2000, the AAA, the American Institute of Certified Public Accountants (AICPA), the Institute of Management Accountants (IMA) and what at the time was referred to as “the Big 5” accounting firms sponsored Albrecht and Sack to study the need for changes in accounting education. In their report, *Accounting Education: Charting the Course through a Perilous Future*, Albrecht and Sack called for accounting educators to “step outside [their] comfort zone” and make the introductory accounting courses more relevant by focusing on using accounting information rather than preparing accounting information (Albrecht & Sack, 2000, pp. 59-63).

Most recently, in 2009 the AAA and the AICPA formed the Pathways Commission to study and recommend changes to accounting education (Black, 2012). The Pathways Commission released its report, *Charting a National Strategy for the Next Generation of Accountants*, in July 2012. The commission recommended that accounting educators emphasize the importance of accounting information in business decision-making in the introductory courses (Pathways Commission, 2012). The commission recognized, however, that one of the impediments to emphasizing the use of accounting information was that “the first course in accounting can be a tug-of-war between the purposes of introducing the broad role of accounting in business and society and beginning to build technical accounting skills” (Pathways Commission, 2012, p. 41).

After the release of the report, William F. Ezzell, Co-Chair of the Pathways Commission and Dean of the College of Business Administration at the University of Rhode Island, noted in a 2012 presentation to the AICPA Council that accounting educators needed “to make introductory courses in accounting more interesting and relevant” (Bonner, 2012, p. 39). Ezzell also stated that educators had “historically been too focused on bookkeeping and debits and credits and failed to give students an adequate understanding of what accounting is all about, why it has value” (Bonner, 2012, p. 39).

In response to all of these reports, accounting educators have used several different techniques to change their introductory courses (Bartley, 2016; Chen, 2017). Some programs have moved from a practitioner, bookkeeping approach to a user of accounting information approach by either excluding or minimizing the use of debits and credits in their introductory courses (Chen, 2017; Deines et al., 2012; Tickell et al., 2012; Warren & Young, 2012). Other programs have continued to use debits and credits in their introductory courses but have added supplemental instruction, using tutors to develop their students' study skills and critical thinking skills (Braun & Sellers, 2012; Etter et al., 2000; Jones 2013). Programs have also promoted active learning by using daily quizzes to motivate students to participate in class (Braun & Sellers, 2012; Warren & Young, 2012). Other programs have redesigned their introductory courses to center around the creation of a business and the accounting issues that will relate to that business (Warren & Young, 2012).

Educators outside traditional business schools have also examined how their majors perceive accounting. Chen (2013) found that hospitality majors in Taiwan believed that understanding accounting information would be important to their careers; nevertheless, these students had anxiety about studying accounting. Goh and Scerri (2016) found that hospitality majors in Australia had both positive and negative attitudes toward the study of accounting. Ultimately, these studies promoted active learning through the use of tutors and additional support material to improve their students' performance (Goh & Scerri, 2016).

Academic scholars have addressed the role that managerial courses play in teaching students about the use of accounting information (Gerdin et al., 2014; Hossain et al., 2008; Tickell et al., 2012) and accounting practitioners have called for accounting educators to emphasize the importance of accounting information in business decision-making (AECC, 1992; Albrecht & Sack, 2000; Pathways Commission, 2012). However, we did not find where scholars or practitioners have addressed the merits of teaching managerial before financial accounting.

How Other Schools Are Teaching Introductory Accounting

Given that some universities have modified their programs, we conducted a review of 40 randomly-selected United States business school programs accredited by the Association to Advance Collegiate Schools of Business – International. Our review focused on whether the selected programs were teaching introductory accounting courses in the traditional sequence with financial being a prerequisite for managerial.

We reviewed the course descriptions found in the universities' 2018-19 course catalogs and found that only one school taught managerial as a prerequisite for financial. Thirty-three programs taught introductory accounting using the traditional sequence. Of the remaining six programs, four schools combined financial and managerial accounting into one introductory course. The two remaining schools combined financial and managerial accounting into two introductory courses. Their course descriptions indicated that the first course emphasized managerial and the second course emphasized financial. However, additional information on the schools' websites indicated that the first course required a financial text and the second course required a managerial text.

While the above indicates that educators have worked to change their introductory courses, few approaches have focused on how accounting is used to make internal management decisions. Our hope is that by switching managerial accounting to the first course, we will make accounting more useful and relevant to both business and non-business majors. We also hope The Switch will improve student retention and lower DFW rates.

Implementation Challenges

We faced significant administrative challenges when implementing The Switch. Changing the order of our introductory courses required that we change their course numbers. This change resulted in modifying the prerequisites for the upper-level accounting courses, as well as the prerequisites for several other courses in the business core curriculum. Additionally, non-business degree programs that required accounting courses had to update their curriculums to reflect the new course numbers.

We also faced the challenge of communicating The Switch to both business and non-business departments on campus. We notified all of the business majors' academic advisors of the change in sequence, as well as all of the non-business majors' academic advisors whose students needed introductory accounting. We then ensured that all of the academic advisors who had students needing only one introductory accounting course understood that they should recommend that their students take managerial accounting. Both the change in the course numbers and the notifications to the academic advisors took a considerable amount of effort.

The accounting faculty faced the biggest challenges during the implementation of The Switch. Their first challenge was to select an appropriate textbook for the managerial course. The vast majority of managerial textbooks presume that students have completed introductory financial accounting before enrolling in managerial, and these texts frequently refer to journal entries and financial statements, especially in the cost manufacturing chapters. The faculty reviewed the few remaining textbooks that did not make these references and selected a text that, unfortunately, proved during the first year of The Switch to require at least some understanding of financial accounting. Therefore, in the second year of The Switch, we changed to a new text that better accommodates students with no prior understanding of financial accounting.

The accounting faculty also faced significant challenges in teaching the managerial course. Since we implemented The Switch in the 2016 Fall Semester, the managerial course has been made up of students with varying degrees of understanding of accounting. While we recommend that students take managerial accounting first, neither introductory course is a prerequisite for the other. Therefore, the managerial course is made up of students who are taking their first accounting course, students who have already taken financial accounting, and students who are taking both introductory courses simultaneously. To deal with the students' varying degrees of understanding, faculty have had to develop innovative explanations for managerial concepts that do not rely on financial accounting. For example, the faculty have developed an explanation for the flow of product costs and the cost of goods sold without using debits and credits, T-accounts, and journal entries. Programs that consider making The Switch should be aware of and address each of the above-mentioned challenges.

Analysis of the Effect of The Switch

We anticipated that The Switch to offering managerial accounting as the first course in the accounting sequence would result in better student performance. The Switch began in the Fall Semester of Academic Year (AY) 2016-17. Three years after implementation, we analyzed the grades students' earned in introductory managerial and financial accounting from Academic Years 2014-2016 (Pre-Switch) and Academic Years 2017-2019 (Post-Switch) to determine whether student performance had improved.

Methodology

We began our evaluation by defining two success measures for student performance: (1) average grade (AvgGrd) and (2) the percentage of students earning an A, B, or C (ABC%). We then defined three non-success measures based on the percentage of students earning (1) a D, F, or W (DFW%), (2) an F or W (FW%), and (3) a W (W%). Note that we achieved positive results when the success measures *increased* and the non-success measures *decreased* Post-Switch.

We analyzed two time periods Pre-Switch: (1) the three-year period beginning in the 2013 Fall Semester and ending in the 2016 Spring Semester (AY 2013-14 through AY 2015-16) and (2) the year immediately prior to The Switch (AY 2015-16). We then analyzed four time-periods Post-Switch: (1) *each* of the three academic years after The Switch (AY 2016-17, AY 2017-18, and AY 2018-19) and (2) the three-year period beginning in the 2016 Fall Semester and ending in the 2019 Spring Semester (AY 2016-17 through AY 2018-19). For the three-year averages, we refer to the academic year ending (AYE) of a particular school year; thus, AYE 2014-16 refers to the academic years ending with the 2014 Spring Semester, the 2015 Spring Semester, and the 2016 Spring Semester. As discussed above, we faced challenges in selecting an appropriate textbook and in developing innovative explanations for managerial concepts; therefore, we believe the year-by-year analysis Post-Switch provides insight into improved student performance as we overcame these challenges.

For the time periods identified, we evaluated data drawn from all face-to-face, full-term sections of the managerial and financial courses taught at our university. For the managerial courses, three full-time faculty members taught 13 sections Pre-Switch, and six full-time faculty members taught 25 sections Post-Switch. For the financial courses, two full-time faculty members taught 17 sections Pre-Switch, and three full-time faculty members taught 18 sections Post-Switch. Approximately half of the faculty members taught both Pre-Switch and Post-Switch, and taught both managerial and financial courses. The small number of faculty members involved might lead some observers to argue that our study lacks generalizability; however, we contend that the small number of faculty members adds validity to our study in that the data results from a consistent group of faculty members teaching the courses both Pre- and Post-Switch.

Our analysis included 1,617 data points (students enrolled) from the three-year period Pre-Switch. Approximately 35 percent (566) were duplicate students based on a student's (1) taking both managerial and financial during the time period or (2) repeating a course due to a withdrawal or a poor grade. We did not remove these students from our analysis. It would be appropriate for a student to take both managerial and financial during the three-year period Pre-Switch and that student's performance would be relevant to our study. Of the 1,617 Pre-Switch data points, approximately 61 percent (987) represent students enrolled in financial when it was taught first in the accounting sequence. Our analysis also included 1,734 data points from the three-year period Post-Switch, with 41 percent being duplicate students. Approximately 38 percent (664) represent students enrolled in financial when it was taught second in the accounting sequence. Table 1 provides a summary of course enrollments.

Expectations

It is important to note that we expected student performance in the managerial course to decline when managerial became the first course in the accounting sequence. For many students, the first accounting course is their initial exposure to a quantitative course (aside from college algebra) and to complex business terminology and concepts. Many students are also just beginning to develop their college study skills, and the first accounting exam often demonstrates to students their need to spend more time and effort to develop a good understanding of the course material. If this expectation proved true, we nevertheless expected any decrease in performance to be offset by increased performance when financial became the second course in the sequence.

In our analysis presented below, we make a number of comparisons between student performance in the financial and managerial courses both Pre- and Post-Switch to determine whether our expectations have been met. Figure 1 provides a master legend for the tables and figures used in our analysis.

The General Effect of The Switch on the Financial and Managerial Courses

Our initial review of the financial (Fin) and managerial (Man) data revealed that student performance in the introductory financial course improved Post-Switch and that performance in the managerial course declined Post-Switch. Therefore, we made additional comparisons of the data and found improved performance in the managerial course.

The Introductory Financial Course

Table 2 presents Pre-Switch and Post-Switch data regarding student performance in the financial course. Figure 2 compares the financial course's three-year average Pre-Switch (Pre-Fin 3 Yr. Avg.) to the three-year average Post-Switch (Post-Fin 3 Yr. Avg.), and the percentage change appears above the bar graph. These comparisons demonstrate that student performance in financial improved substantially Post-Switch, with the success measures increasing and the non-success measures decreasing. Specifically, the ABC% increased 15.7 percent (from 54.7% to 63.3%) and the DFW% decreased 19.0 percent (from 45.3% to 36.7%). Moreover, the FW% and W% decreased more than 36 percent. We conducted a t-test on means (unpaired, one-tailed) and found that each measure's change was statistically significant (p -value $< .01$).

Figure 2 also compares the three-year average Pre-Switch (Pre-Fin 3 Yr. Avg.) with each academic year Post-Switch (Post-Fin AY 2016-17, AY 2017-18, AY 2018-19), and the percentage changes appear below the bar graph. These comparisons demonstrate that student performance improved for each academic year Post-Switch. In Academic

Year 2018-19, the ABC% increased 21.6 percent (from 54.7% to 66.5%) and the DFW% decreased 26.0 percent (from 45.3% to 33.5%). Although AY 2017-18 had the lowest amount of improvement in both the success and non-success measures, performance in AY 2017-18 showed improvement over the three-year average Pre-Switch.

The Introductory Managerial Course

Table 3 presents Pre-Switch and Post-Switch data regarding student performance in the managerial course. Figure 3A compares the managerial course's three-year average Pre-Switch (Pre-Man 3 Yr. Avg.) to the three-year average Post-Switch (Post-Man 3 Yr. Avg.), and the percentage changes appear above the bar graph. These comparisons confirm our expectation that student performance in managerial would decline Post-Switch, with the success measures decreasing and the non-success measures increasing. We conducted a t-test on means (unpaired, one-tailed) and found that each measures' change was statistically significant (p -value $< .05$ or $< .01$).

Figure 3A also compares the three-year average Pre-Switch (Pre-Man 3 Yr. Avg.) with each academic year Post-Switch (Post-Man AY 2016-17, AY 2017-18, AY 2018-19), and the percentage change appears below the bar graph. The percentage change in the three-year average Pre-Switch and the last academic year Post-Switch (Post-Man AY 2018-19) demonstrates improved performance for both the success and non-success measures when compared to the percentage change in the three-year average Pre-Switch and the three-year average Post-Switch discussed above. For example, the 3.4 percent increase in the AvgGrd (from 2.36 Pre-Man to 2.44 Post-Man AY 2018-19) is an improvement over the 5.9 percent decline for the three-year average Post-Man (from 2.36 Pre-Man to 2.22 Post-Man). Likewise, the 21.8 percent increase in the DFW% (from 31.6 Pre-Man to 38.5 Post-Man AY 2018-19) is an improvement over the 36.1 percent increase for the three-year average Post-Man (from 31.6 Pre-Man to 43.0 Post-Man). We conducted a t-test on means (unpaired, one-tailed) of the comparison of the Pre-Man 3 Yr. Avg. and Academic Year 2018-19 and found that the change in the FW% and W% was statistically significant (p -value $< .05$).

Figure 3B compares each of the academic years Post-Switch (Post-Man AY 2016-17, AY 2017-18, AY 2018-19) and also demonstrates a trend toward improved student performance in managerial. Figure 3B compares the change from year to year for the academic years Post-Switch, and the percentage change appears above the bar graph. The success measures increased from year to year and, with the exception of W% in AY 2017-18, the non-success measures decreased from year to year. Figure 3B also presents the change from the first academic year Post-Switch to the last academic year Post-Switch, and the percentage change appears below the bar graph. These comparisons demonstrate that performance improved in both the success and non-success measures from AY 2016-17 to AY 2018-19. Specifically, the AvgGrd increased 21.4 percent (from 2.01 to 2.25 to 2.44) and the FW% decreased 27.7% (from 34.3% to 32.8% to 24.8%) over the three academic years Post-Man.

Having found an improvement in financial performance and a decline in managerial performance (albeit an improving performance over time) Post-Switch, we considered whether we had merely shifted the original performance problem to managerial.

Did We Shift the Performance Problem to the Managerial Course?

We examined whether the decline in performance in managerial negated the increase in performance in financial. Table 4 combines select data from Tables 2 and 3 and presents Pre-Switch and Post-Switch data regarding student performance in both introductory courses. Figure 4A compares the three-year average Pre-Switch to the three-year average Post-Switch for both courses (Pre-Fin 3 Yr. Avg. to Post-Fin 3 Yr. Avg.; Pre-Man 3 Yr. Avg. to Post-Man 3 Yr. Avg.), and the percentage changes appear above the bar graph. These comparisons demonstrate that the percentage decrease in the managerial success measures was less than or nearly equal to the percentage increase in financial's measures. Specifically, the 5.9 percent decrease in the managerial AvgGrd (from 2.36 Pre-Man to 2.22 Post-Man) was less than the 11.9 percent increase in the financial AvgGrd (from 2.02 Pre-Fin to 2.26 Post-Fin). Also, the 16.7 percent decrease in the managerial ABC% (from 68.4% Pre-Man to 57.0% Post-Man) was nearly equal to the 15.7 percent increase in the financial ABC% (from 54.7% Pre-Fin to 63.3% Post-Fin). However, the percentage increase in the managerial non-success measures was much greater than the decrease in financial's measures. As provided above, for both managerial and financial, the change in each of the measures was statistically significant (p -value $< .05$ or $< .01$).

This lack of an offset of the managerial non-success measures led us to compare the three-year average Pre-Switch to the last academic year Post-Switch for both courses. Figure 4A presents these comparisons (Pre-Fin 3 Yr. Avg. to Post-Fin AY 2018-19; Pre-Man 3 Yr. Avg. to Post-Man AY 2018-19), and the percentage changes appear below the bar graph. These comparisons demonstrate an even greater offsetting of the managerial measures by the financial measures. When comparing the performance in the Academic Year 2018-19, both managerial success measures are offset by increases in financial's measures. Specifically, the 10.1 percent decrease in the managerial ABC% (from 68.4% Pre-Man to 61.5% Post-Man AY 2018-19) was less than the 21.6% percent increase in the financial ABC% (from 54.7% Pre-Fin to 66.5% Post Fin AY 2018-19). Moreover, with the exception of the W%, the percentage increase in the managerial non-success measures was less than the percentage decrease in financial's measures. For example, the FW% increased 31.2 percent in managerial (from 18.9% Pre-Man to 24.8% Post-Man AY 2018-19) and decreased 45.7 percent in financial (from 31.5% Pre-Fin to 17.1% Post-Fin AY 2018-19). As provided above, the change in the FW% and W% was statistically significant (p -value $< .05$).

Our analyses of the general effect of The Switch on the financial and managerial courses demonstrate an improvement in both courses, especially when viewed in light of the challenges to implementing The Switch. As discussed in "Implementation Challenges" above, the accounting faculty faced challenges in selecting an appropriate textbook and in developing innovative explanations for managerial concepts. Despite these challenges, the upward trend in success measures for managerial indicates that the faculty are overcoming these challenges. Therefore, we anticipate continued improvement in student performance in managerial.

The Effect of The Switch on the Introductory Accounting Sequence

We made several additional comparisons of the financial and managerial data to give us further insight into whether The Switch improved the introductory accounting sequence. Figure 4B compares the first introductory accounting course Pre-Switch (Pre-Fin) to Post-Switch (Post-Man), and the percentage change appears above the bar graph. These comparisons demonstrate that student performance was better when managerial was the first course in the accounting sequence than when financial was the first course. After The Switch, the AvgGrd in the first accounting course increased 9.9 percent (from 2.02 Pre-Fin to 2.22 Post-Man) and the ABC% increased 4.2 percent (from 54.7% to 57.0%). Although the W% increased 14.1 percent (from 19.1% to 21.8%), the DFW% decreased 5.1 percent (from 45.3% to 43.0%) and the FW% decreased 2.9 percent (from 31.5% to 30.6%). With the exception of the W%, all of the measures demonstrate improved student performance when managerial was the first course in the sequence. We conducted a t-test on means (unpaired, one-tailed) and found that the change in the AvgGrd was statistically significant (p -value $< .01$).

Figure 4B also compares the three-year average for financial Pre-Switch and Post-Switch, as well as the second introductory accounting course Pre-Switch (Pre-Man) to Post-Switch (Post-Fin). The percentage changes appear below the bar graph. Although these comparisons demonstrate that student performance was lower when financial was the second course in the sequence (Post-Fin) than when managerial was second in the sequence (Pre-Man), the performance Post-Fin was still better than when financial was the first course in the sequence (Pre-Fin). For example, when compared to the Pre-Man ABC%, the Post-Fin ABC% decreased by 7.5 percent (from 68.4% to 63.3%); however, when compared to the Pre-Fin ABC%, the Post-Fin ABC% increased by 15.7 percent (from 54.7% to 63.3%). Likewise, when compared to the Pre-Man FW%, the Post-Fin FW% increased by 5.3 percent (from 18.9% to 19.9%); however, when compared to the Pre-Fin FW%, the Post-Fin FW% decreased by 36.8 percent (from 31.5% to 19.9%). We conducted a t-test on means (unpaired, one-tailed) for the difference between the three-year averages for Pre-Man and Post-Fin and found none of the changes in the measures were statistically significant. However, as discussed above, the difference for all of the measures from Pre-Fin to Post-Fin was statistically significant (p -value $< .01$). We anticipate that this improved performance in financial will have a positive impact on student performance in subsequent courses, such as the introductory finance course and upper-level accounting courses; however, such analysis is beyond the scope of the present study.

The Effect of The Switch on Non-Business Majors vs. Business Majors

When we first addressed low student performance in the introductory accounting courses, we considered whether non-business majors who were required to complete only one accounting course might benefit more from completing managerial than financial accounting. Table 5 presents Pre-Switch and Post-Switch data regarding non-business and business students' performance in the managerial and financial courses. Notably after The Switch, the number of non-business majors enrolled in financial declined (from 368 to 229), whereas the number of non-business majors enrolled in managerial increased (from 179 to 390). As for business majors, the number enrolled in financial declined (from 619 to 435) after The Switch, whereas the number of business majors enrolled in managerial increased (from 451 to 680).

Before examining all of the success and non-success measures for non-business and business majors, Figures 5A and 5B compare performance, as measured by the ABC% and the DFW%, respectively, for each academic year Post-Switch. Specifically, we compare both courses Pre-Switch and the last academic year Post-Switch (AY 2018-19). These comparisons demonstrate that non-business majors benefitted from completing managerial instead of financial through an increase in the ABC% and a decrease in the DFW% Post-Switch. Specifically, the managerial ABC% for non-business majors increased 7.2 percent (from 60.9% Pre-Man to 65.3% Post-Man AY 2018-19), and the managerial DFW% for non-business majors decreased 11.3 percent (from 39.1% Pre-Man to 34.7% Post-Man AY 2018-19). Moreover, Figures 5A and 5B demonstrate that the non-business majors who also completed the financial course benefitted from The Switch through an increase in the ABC% and a decrease in the DFW% Post-Switch. Specifically, the financial ABC% for non-business majors increased 7.6 percent (from 52.3% Pre-Fin to 56.3% Post-Fin AY 2018-19) and the financial DFW% decreased 8.2 percent (from 47.7% Pre-Fin to 43.8% Post-Fin AY 2018-19). Figures 5A and 5B also indicate that non-business majors benefitted more from The Switch than business majors, who only benefitted in the financial course with the ABC% increasing by 28.6 percent (from 56.2% Pre-Fin to 59.1% Post-Fin AY 2018-19). This snapshot of the data led us to compare all success and non-success measures for non-business and business majors Pre- and Post-Switch.

Figure 5C compares the performance of non-business and business majors in both courses Pre-Switch (Pre-Fin) and Post-Switch (Post-Man), and the percentage changes appear above the bar graph. These comparisons are consistent with Figure 4A, with both non-business and business majors' performance (1) improving when financial was the second course in the sequence and (2) declining when managerial was the first course in the sequence, with only the non-business majors' managerial AvgGrd increasing 1.8 percent (from 2.17 Pre-Fin to 2.21 Post-Man). As discussed above and depicted in Figure 3A, we expected this decline in managerial performance Post-Switch and found a trend toward improved performance, particularly in the last academic year Post-Switch. For the non-business and business majors, we tested the statistical significance of the difference between the three-year averages Pre- and Post-Switch for both courses. We used a t-test on means (unpaired, one-tailed) for AvgGrd and a z-test on proportions for the other measures. For the non-business students' financial comparison, the AvgGrd, FW%, and W% were statistically significant ($p < .05$ or $< .01$) and, for managerial, we found that none of the measures were statistically significant. For the business students' financial comparisons, we found that each of the measures was statistically significant ($p < .01$) and, for managerial, we found that each of the measures was statistically significant ($p < .05$ or $< .01$).

Figure 5C also compares non-business and business majors' performance in the first course in the introductory accounting sequence Pre- and Post-Switch, and the percentage changes appear below the bar graph. For non-business majors, these comparisons are consistent with Figure 4B with performance improving when managerial was the first course in the sequence. Specifically, non-business majors' AvgGrd in the first accounting course increased 13.3 percent (from 1.95 Pre-Fin to 2.21 Post-Man) and the FW% decreased 16.1 percent (from 35.4% to 29.75%), whereas the AvgGrd in the first accounting course increased 9.9 percent and the FW% decreased 2.9 percent in Figure 4B. Moreover, non-business majors' 1.7 percent decrease in W% was an improvement over the 14.1 percent increase in Figure 4B.

The results for business majors are not as consistent with Figure 4B as the results for non-business majors. While the change in the success measures was positive for business majors, two of the non-success measures declined when managerial was first in the sequence. Business majors' FW% increased 8.2 percent (from 29.4% to 31.8%) and their

W% increased 28.5 percent (from 16.5% to 21.2%), whereas the FW% decreased 2.9 percent and the W% increased 14.1 percent in Figure 4B. One possible explanation for the difference in the non-business major's W% performance and the business majors' FW% and W% with the percentages in Figure 4B is that business students comprise 63.6 percent (680 out of 1070) of Post-Switch enrollment, thereby skewing the results when compared to Figure 4B. Regardless of the difference in the non-business and business majors' performance in the non-success measures, as we move forward with The Switch, we anticipate that both non-business and business students' performance will improve in managerial, as we saw in Figure 3A.

Summary of Findings

Our analysis of student performance, as measured by the grades students earned and the withdrawal rates in the introductory accounting courses from the 2014 Fall Semester through the 2019 Spring Semester, demonstrates that performance improved with The Switch. In summary, we found the following:

- When financial became the second course in the accounting sequence, student performance in financial improved significantly (Figure 2).
- As we expected, student performance declined when managerial came first in the accounting sequence (Figure 3A). However, the success and non-success measures in the last academic year Post-Switch indicate improved performance over the three-year average Post-Switch (Figure 3A). Moreover, after The Switch, the success measures increased each academic year and, except for one year's withdrawal rate, the non-success measures decreased each academic year (Figure 3B).
- After The Switch, the decline in the managerial success measures were offset by the improvement in financial's measures (Figure 4A). Moreover, the decline in the managerial non-success measures in the last academic year Post-Switch were more than offset by the improvement in financial's measures (Figure 4A).
- Student performance was better when managerial was first in the accounting sequence than when financial was first (Figure 4B).
- Student performance was better when managerial was second in the accounting sequence; however, performance was better when financial was second in the accounting sequence than when financial was first (Figure 4B).
- Non-business majors' performance improved when managerial was the first course in the accounting sequence (Figure 5C). Moreover, non-business majors' overall performance in both courses improved when managerial was the first course (Figure 5C).
- Business majors' performance declined when managerial was the first course in the accounting sequence (Figure 5C). While business majors' performance in financial improved when that course was second, the improvement did not offset the decline in performance when managerial was first (Figure 5C).
- Both non-business and business students' success measures improved when managerial was first in the accounting sequence, as opposed to financial. Moreover, both students' DFW% improved (Figure 5C).

Future Research

This research could extend to a study of the impact of The Switch on the first intermediate accounting course, because The Switch reduces the time lapse between the introductory financial course and the first intermediate course. For the same reason, this research could extend to the impact of The Switch on other courses in the business core curriculum, such as the introductory finance course.

Although some scholars have already addressed student perceptions of accounting, future research could explore the impact on perceptions when managerial is taught first. In preparation for this paper, the authors asked our introductory accounting instructors if students had expressed a negative perception of accounting during the managerial and financial courses Post-Switch. Both the managerial and financial instructors reported that less than half of the students believed that the concepts learned in the course would be helpful in their degree program or benefit them in their careers. On a positive note, the financial instructors reported that about half of the students said

that the concepts covered in financial were familiar because those concepts had been introduced in managerial. This anecdotal evidence sheds some light on student perceptions of accounting after The Switch.

Conclusion

By developing The Switch, we addressed the Pathway Commission's call to make introductory accounting more relevant to students and reduced our DFW rates. The Switch provides a practical and effective means for improving accounting education and student performance. Even though there are some administrative and teaching challenges, we encourage other programs to implement The Switch and believe they will find success.

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Table 1
Course Enrollments

	Pre-Switch^a		Post-Switch^b	
	Financial First in Sequence		Managerial First in Sequence	
	Fin	Man	Man	Fin
Face-to-Face Sections	17	13	25	18
Full-Time Instructors	2	3	6	3
Students	987	630	1,070	664

^a Of the 1,617 students who took introductory accounting courses Pre-Switch, 35 percent were duplicates.

^b Of the 1,734 student who took introductory accounting courses Post-Switch, 41 percent were duplicates.

Figure 1

Master Legend

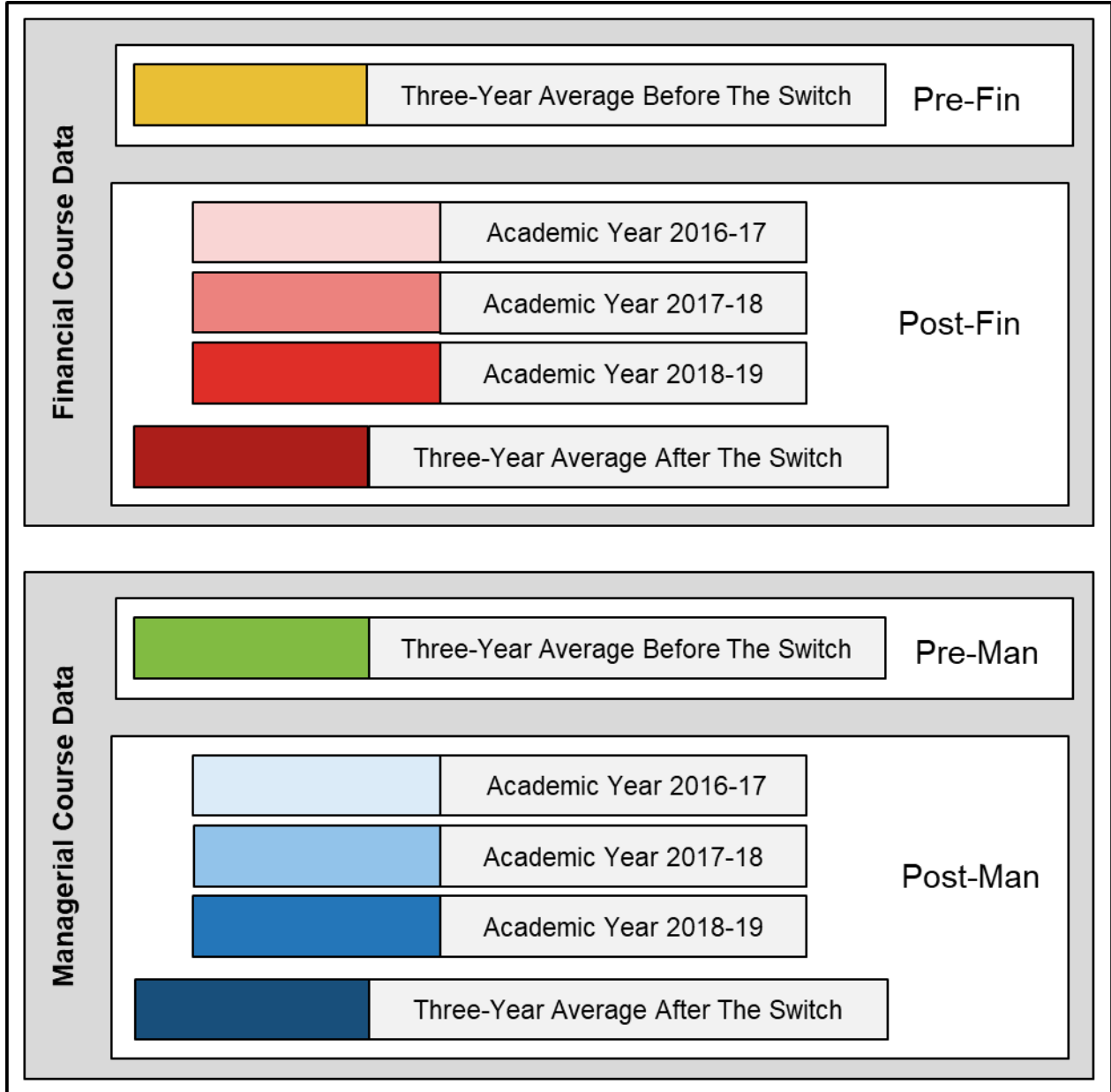


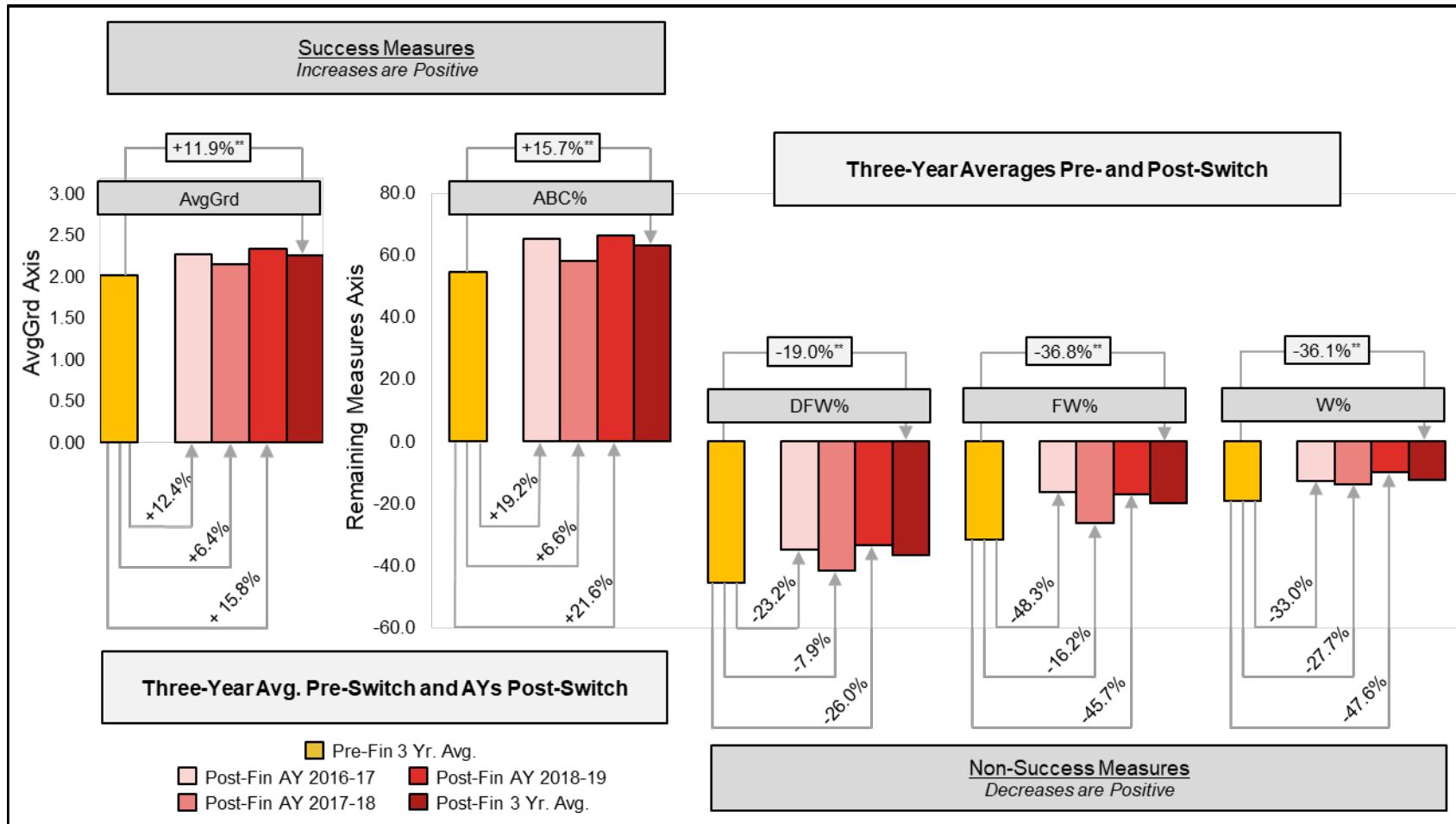
Table 2
Introductory Financial Course

Academic Year	Student Count	Success Measures <i>Increases are Positive</i>		Non-Success Measures <i>Decreases are Positive</i>		
		AvgGrd	ABC%	DFW%	FW%	W%
Pre-Switch						
<i>Pre-Fin (AY 2015-2016)</i>	298	2.00	53.0	47.0	30.7	18.0
<u>Pre-Fin 3 Yr. Avg.</u> (AYEs 2014-2016)	987	2.02	54.7	45.3	31.5	19.1
Post-Switch						
<i>Post-Fin (AY 2016-2017)</i>	141	2.27	65.2	34.8	16.3	12.8
<i>Post-Fin (AY 2017-2018)</i>	254	2.15	58.3	41.7	26.4	13.8
<i>Post-Fin (AY 2018-2019)</i>	269	2.34	66.5	33.5	17.1	10.0
<u>Post-Fin 3 Yr. Avg.</u> (AYEs 2017-2019)	664	2.26	63.3	36.7	19.9	12.2
Comparison of <u>Pre-Fin 3 Yr. Avg.</u> and <u>Post-Fin 3 Yr. Avg.</u>		+11.9%** (<i>p</i> < .001)	+15.7%** (<i>p</i> < .001)	-19.0%** (<i>p</i> < .001)	-36.8%** (<i>p</i> < .001)	-36.1%** (<i>p</i> < .001)

***p* < .01 for one-tailed, unpaired t-test on means comparison of Pre-Fin 3 Yr. Avg. and Post-Fin 3 Yr. Avg.

Figure 2

Comparison of Three-Year Averages for Financial Pre- and Post-Switch (Above Bars) and Comparison of Three-Year Average for Financial Pre-Switch with Each Academic Year Post-Switch (Below)



**p < .01

Table 3*Introductory Managerial Course*

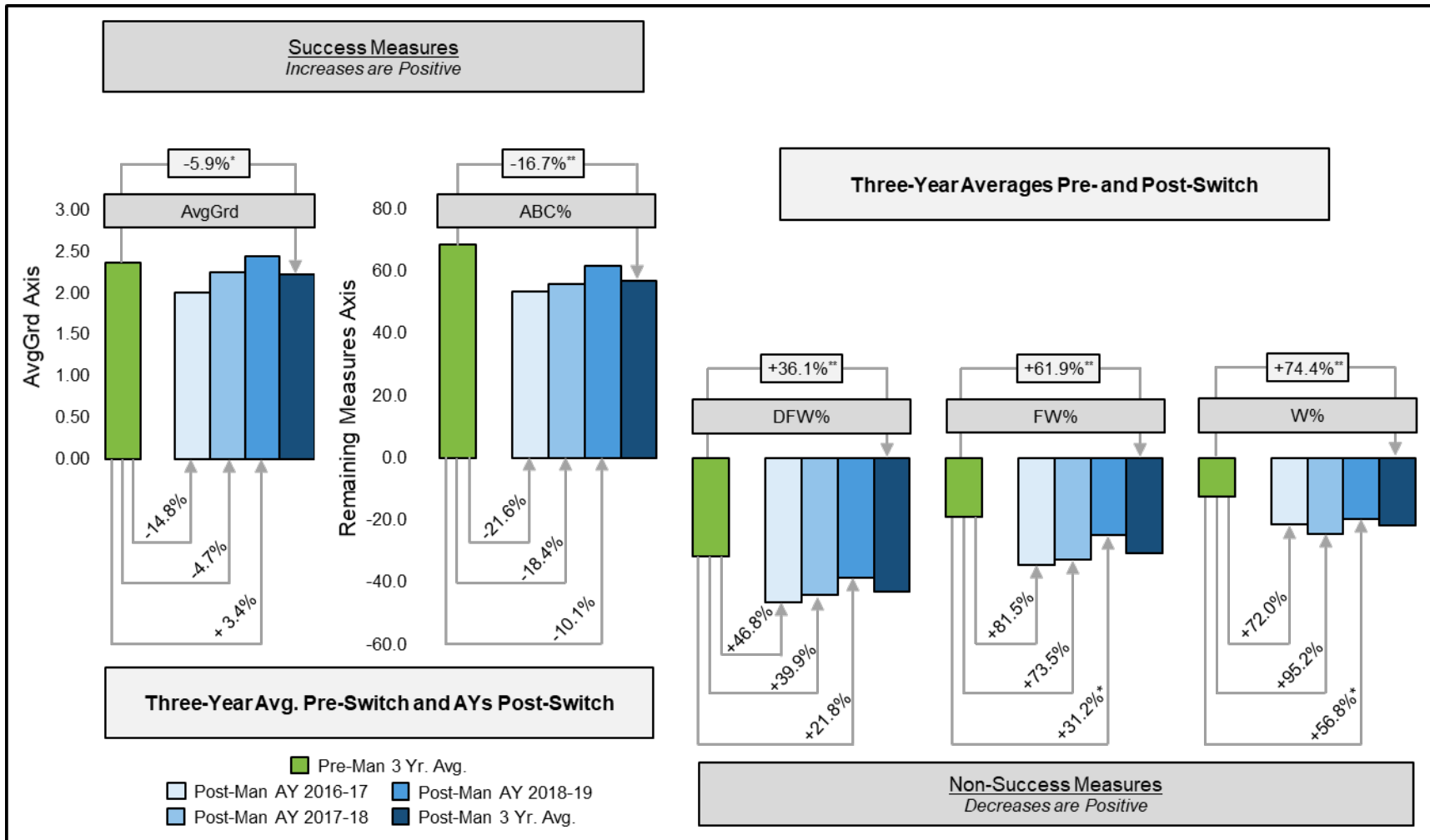
Academic Year	Student Count	Success Measures <i>Increases are Positive</i>		Non-Success Measures <i>Decreases are Positive</i>		
		AvgGrd	ABC%	DFW%	FW%	W%
Pre-Switch						
<i>Pre-Man (AY 2015-2016)</i>	197	2.30	67.5	32.5	18.8	14.2
<u>Pre-Man 3 Yr. Avg.</u> (AYEs 2014-2016)	630	2.36	68.4	31.6	18.9	12.5
Post-Switch						
<i>Post-Man (AY 2016-2017)</i>	404	2.01	53.6	46.4	34.3	21.5
<i>Post-Man (AY 2017-2018)</i>	344	2.25	55.8	44.2	32.8	24.4
<i>Post-Man (AY 2018-2019)</i>	322	2.44	61.5	38.5	24.8	19.6
<u>Post-Man 3 Yr. Avg.</u> (AYEs 2017-2019)	1070	2.22	57.0	43.0	30.6	21.8
Comparison of						
<u>Pre-Man 3 Yr. Avg.</u> and <u>Post-Man 3 Yr. Avg.</u>		-5.9%* ($p = .037$)	-16.7%** ($p < .001$)	+36.1%** ($p < .001$)	+61.9%** ($p < .001$)	+74.4%** ($p < .001$)
Comparison of						
<u>Pre-Man 3 Yr. Avg.</u> and <i>Post-Man AY 2018-2019</i>		+3.4% ($p = .344$)	-10.1% ($p = .125$)	+21.8% ($p = .125$)	+31.2%* ($p = .038$)	+56.8%* ($p = .031$)

* $p < .05$ and ** $p < .01$ for one-tailed, unpaired t-test on means comparison of Pre-Man 3 Yr. Avg. and Post-Man 3 Yr. Avg.

* $p < .05$ for one-tailed, unpaired t-test on means comparison of Pre-Man 3 Yr. Avg. and Post-Man AY 2018-2019.

Figure 3A

Comparison of Three-Year Averages for Managerial Pre- and Post-Switch (Above Bars) and Comparison of Three-Year Average for Managerial Pre-Switch with Each Academic Year Post-Switch (Below)



*p < .05
 **p < .01

Figure 3B

Comparison of Managerial Performance Year to Year for Academic Years Post-Switch (Above Bars) and Comparison of Managerial Performance from First to Last Academic Year Post-Switch (Below)

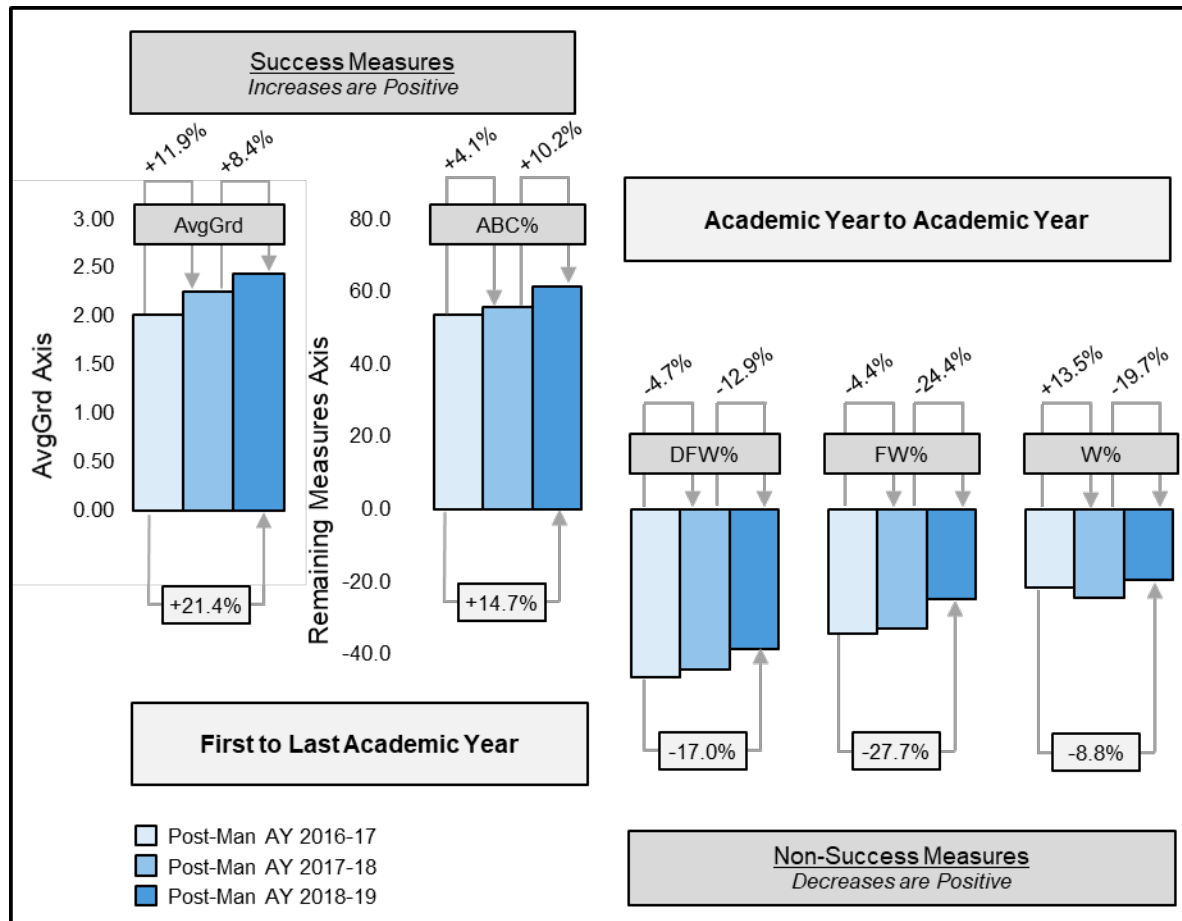


Table 4

Introductory Managerial and Financial Courses

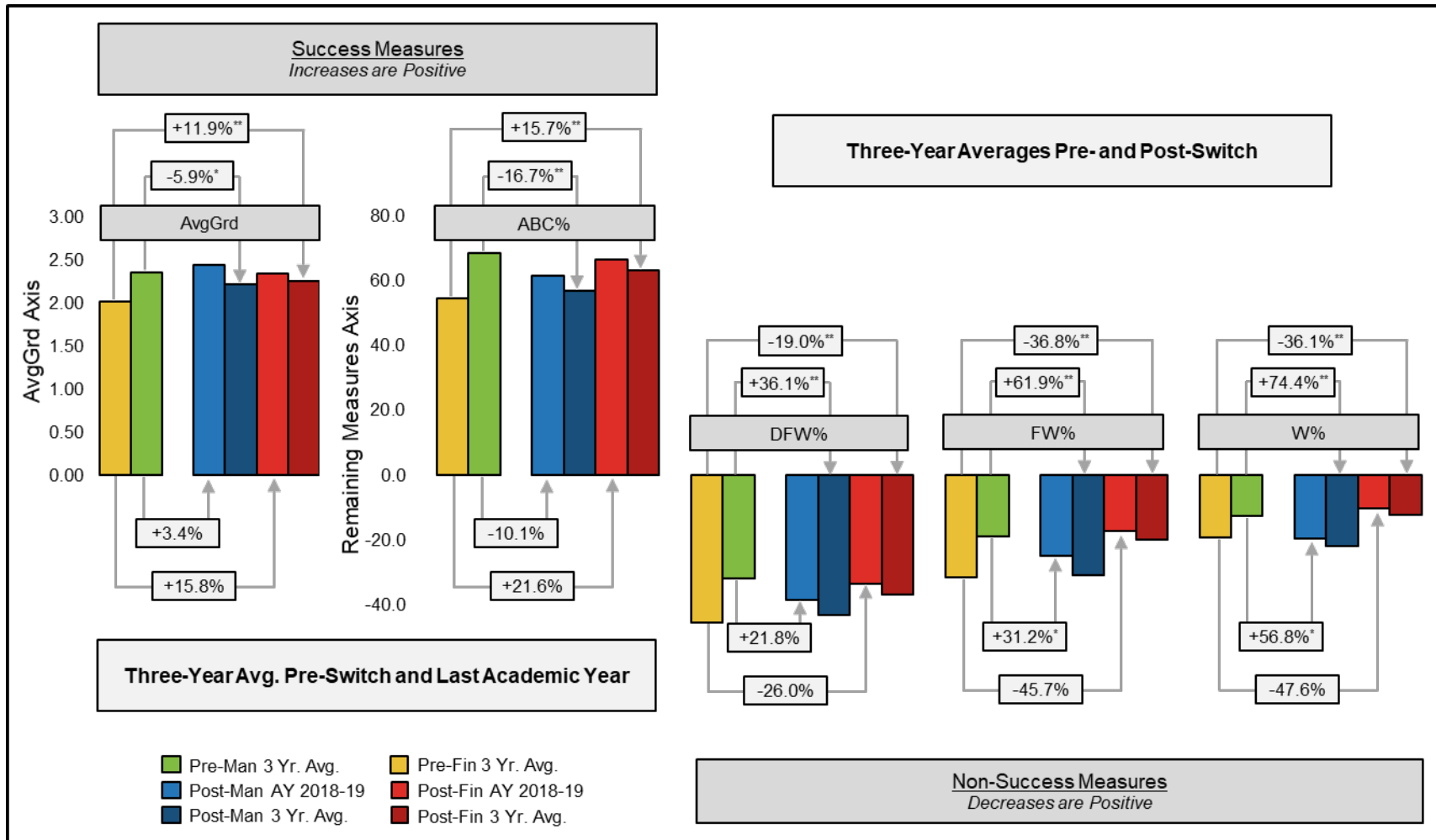
Academic Year	Student Count	Success Measures <i>Increases are Positive</i>		Non-Success Measures <i>Decreases are Positive</i>		
		AvgGrd	ABC%	DFW%	FW%	W%
Pre-Switch						
<u>Pre-Fin 3 Yr. Avg.</u> (AYEs 2014-2016)	987	2.02	54.7	45.3	31.5	19.1
<u>Pre-Man 3 Yr. Avg.</u> (AYEs 2014-2016)	630	2.36	68.4	31.6	18.9	12.5
Post-Switch						
<i>Post-Man (AY 2018-2019)</i>	322	2.44	61.5	38.5	24.8	19.6
<u>Post-Man 3 Yr. Avg.</u> (AYEs 2017-2019)	1070	2.22	57.0	43.0	30.6	21.8
<i>Post-Fin (AY 2018-2019)</i>	269	2.34	66.5	33.5	17.1	10.0
<u>Post-Fin 3 Yr. Avg.</u> (AYEs 2017-2019)	664	2.26	63.3	36.7	19.9	12.2
Comparison of 1st Course in Sequence						
<u>Pre-Fin 3 Yr. Avg.</u> and <u>Post-Man 3 Yr. Avg.</u>		+9.9%** (<i>p</i> = .002)	+4.2% (<i>p</i> = .184)	-5.1% (<i>p</i> = .209)	-2.9% (<i>p</i> = .394)	+14.1% (<i>p</i> = .055)
Comparison of 2nd Course in Sequence						
<u>Pre-Man 3 Yr. Avg.</u> and <u>Post-Fin 3 Yr. Avg.</u>		-4.2% (<i>p</i> = .153)	-7.5% (<i>p</i> = .192)	+16.1% (<i>p</i> = .192)	+5.3% (<i>p</i> = .236)	-2.4% (<i>p</i> = .429)
Comparison of						
<u>Pre-Man 3 Yr. Avg.</u> and <i>Post-Man AY 2018-2019</i>		+3.4% (<i>p</i> = .344)	-10.1% (<i>p</i> = .125)	+21.8% (<i>p</i> = .125)	+31.2%* (<i>p</i> = .038)	+56.8%* (<i>p</i> = .031)

***p* < .01 for one-tailed, unpaired t-test on means comparison of Pre-Fin 3 Yr. Avg. and Post-Man 3 Yr. Avg.

**p* < .05 for one-tailed, unpaired t-test on means comparison of Pre-Man 3 Yr. Avg. and Post-Man AY 2018-2019.

Figure 4A

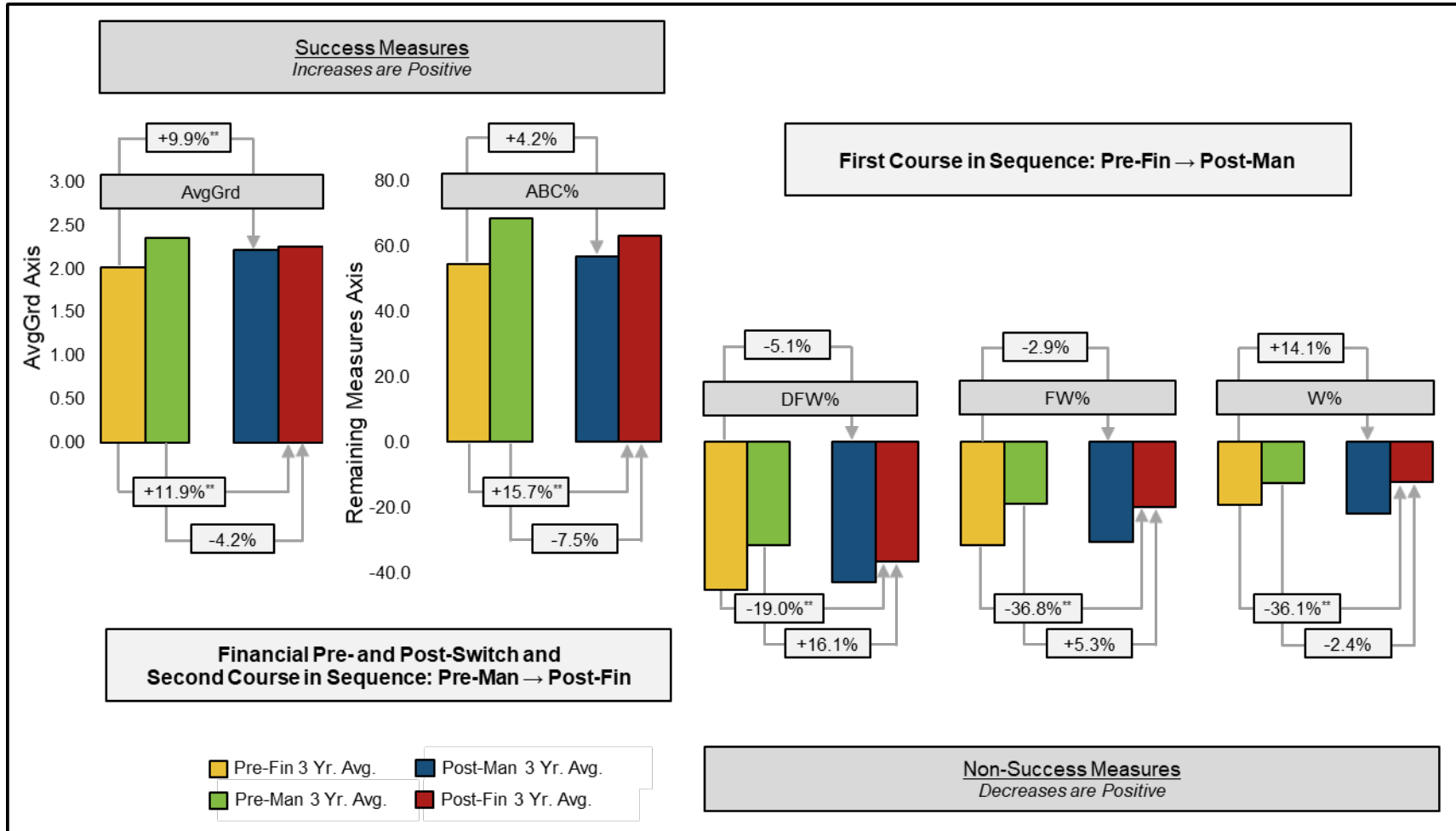
Comparison of Three-Year Averages for Financial and Managerial Pre- and Post-Switch (Above Bars) and Comparison of Three-Year Average Pre-Switch with Last Academic Year Post-Switch (Below)



* $p < .05$
** $p < .01$

Figure 4B

Comparison of the First Course in the Introductory Accounting Sequence Pre- and Post-Switch (Above Bars) and Comparison of the Second Course Pre- and Post-Switch with the Financial Course Pre- and Post-Switch (Below)



**p < .01

Table 5

Non-Business & Business Majors' Performance Pre- and Post-Switch

Academic Year	Student Count	Success Measures <i>Increases are Positive</i>		Non-Success Measures <i>Decreases are Positive</i>		
		AvgGrd	ABC%	DFW%	FW%	W%
Pre-Switch: Non-Busn.						
<u>Pre-Fin 3 Yr. Avg.</u>	368	1.95	52.3	47.7	35.4	23.2
<u>Pre-Man 3 Yr. Avg.</u>	179	2.17	60.9	39.1	26.3	19.0
Pre-Switch: Busn.						
<u>Pre-Fin 3 Yr. Avg.</u>	619	2.06	56.2	43.8	29.4	16.5
<u>Pre-Man 3 Yr. Avg.</u>	451	2.42	71.4	28.6	16.0	9.8
Post-Switch: Non-Busn.						
<i>Post-Fin (AY 2016-2017)</i>	43	2.25	60.5	39.5	20.9	16.3
<i>Post-Fin (AY 2017-2018)</i>	90	2.16	57.8	42.2	28.9	16.7
<i>Post-Fin (AY 2018-2019)</i>	96	2.21	56.3	43.8	24.0	16.7
<u>Post-Fin 3 Yr. Avg.</u>	229	2.20	57.6	42.4	25.3	16.6
<i>Post-Man (AY 2016-2017)</i>	141	2.06	51.8	48.2	34.8	24.1
<i>Post-Man (AY 2017-2018)</i>	125	2.16	52.8	47.2	34.4	28.0
<i>Post-Man (AY 2018-2019)</i>	124	2.40	65.3	34.7	19.4	16.1
<u>Post-Man 3 Yr. Avg.</u>	390	2.21	56.4	43.6	29.7	22.8
Post-Switch: Busn.						
<i>Post-Fin (AY 2016-2017)</i>	98	2.28	67.0	33.0	14.0	11.0
<i>Post-Fin (AY 2017-2018)</i>	164	2.15	58.5	41.5	25.0	12.2
<i>Post-Fin (AY 2018-2019)</i>	173	2.41	72.3	27.8	13.3	6.4
<u>Post-Fin 3 Yr. Avg.</u>	435	2.28	65.8	34.3	17.9	9.7
<i>Post-Man (AY 2016-2017)</i>	263	1.98	54.4	45.6	34.2	19.8
<i>Post-Man (AY 2017-2018)</i>	219	2.30	57.5	42.5	32.0	22.4
<i>Post-Man (AY 2018-2019)</i>	198	2.46	59.1	40.9	28.3	21.7
<u>Post-Man 3 Yr. Avg.</u>	680	2.23	56.8	43.2	31.8	21.2

Table 5 (cont.)

Non-Business & Business Majors' Performance Pre- and Post-Switch

Academic Year	Success Measures <i>Increases are Positive</i>		Non-Success Measures <i>Decreases are Positive</i>		
	AvgGrd	ABC%	DFW%	FW%	W%
Comparisons: Non-Busn.					
<u>Pre-Fin 3 Yr. Avg. & Post-Fin 3 Yr. Avg.</u>	+12.8%* (<i>p</i> < .029)	+10.1% (<i>p</i> = .102)	-11.1% (<i>p</i> = .102)	-28.5** (<i>p</i> = .005)	-28.4%* (<i>p</i> = .027)
<u>Pre-Fin 3 Yr. Avg. & Post-Fin AY 2018-2019</u>	+13.3%	+7.6%	-8.2%	-32.2%	-28.0%
<u>Pre-Man 3 Yr. Avg. & Post-Man 3 Yr. Avg.</u>	+1.8% (<i>p</i> = .773)	-7.4% (<i>p</i> = .156)	+11.5% (<i>p</i> = .156)	+12.9% (<i>p</i> = .198)	+20.0% (<i>p</i> = .152)
<u>Pre-Man 3 Yr. Avg. & Post-Man AY 2018-2019</u>	+10.6%	+7.2%	-11.3%	-26.2%	-15.3%
<u>Pre-Fin 3 Yr. Avg. & Post-Man 3 Yr. Avg.</u>	+13.3%	+7.8%	-8.6%	-16.1%	-1.7%
Comparisons: Busn.					
<u>Pre-Fin 3 Yr. Avg. & Post-Fin 3 Yr. Avg.</u>	+10.7%** (<i>p</i> = .009)	+17.1%** (<i>p</i> = .001)	-21.7%** (<i>p</i> = .001)	-39.1%** (<i>p</i> < .001)	-41.2%** (<i>p</i> = .001)
<u>Pre-Fin 3 Yr. Avg. & Post-Fin AY 2018-2019</u>	+17.0%	+28.6%	-36.5%	-54.8%	-61.2%
<u>Pre-Man 3 Yr. Avg. & Post-Man 3 Yr. Avg.</u>	-7.9%* (<i>p</i> = .015)	-20.4%** (<i>p</i> < .001)	+51.0%** (<i>p</i> < .001)	+98.8%** (<i>p</i> < .001)	+116.3%** (<i>p</i> < .001)
<u>Pre-Man 3 Yr. Avg. & Post-Man AY 2018-2019</u>	+1.7%	-17.2%	+43.0%	+76.9%	+121.4%
<u>Pre-Fin 3 Yr. Avg. & Post-Man 3 Yr. Avg.</u>	+8.3%	+1.1%	-1.4%	+8.2%	+28.5%

p* < .05 and *p* < .01 for comparison of (1) Pre-Fin 3 Yr. Avg. and Post-Fin 3 Yr. Avg. and (2) Pre-Man 3 Yr. Avg. and Post-Man 3 Yr. Avg. for both Non-Business and Business, with a one-tail t-test of means for AvgGrd and z-test on proportions for the other measures.

Figure 5A

Comparison of Non-Business & Business Students' ABC% Pre- and Post-Switch

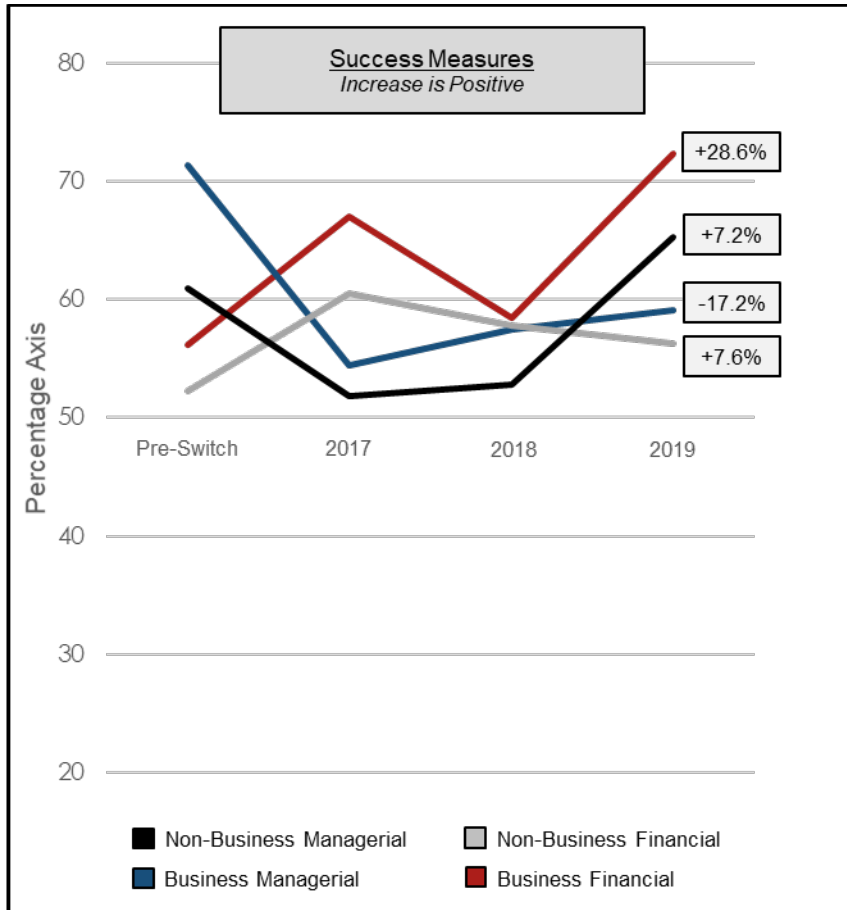


Figure 5B

Comparison of Non-Business & Business Students' DFW% Pre- and Post-Switch

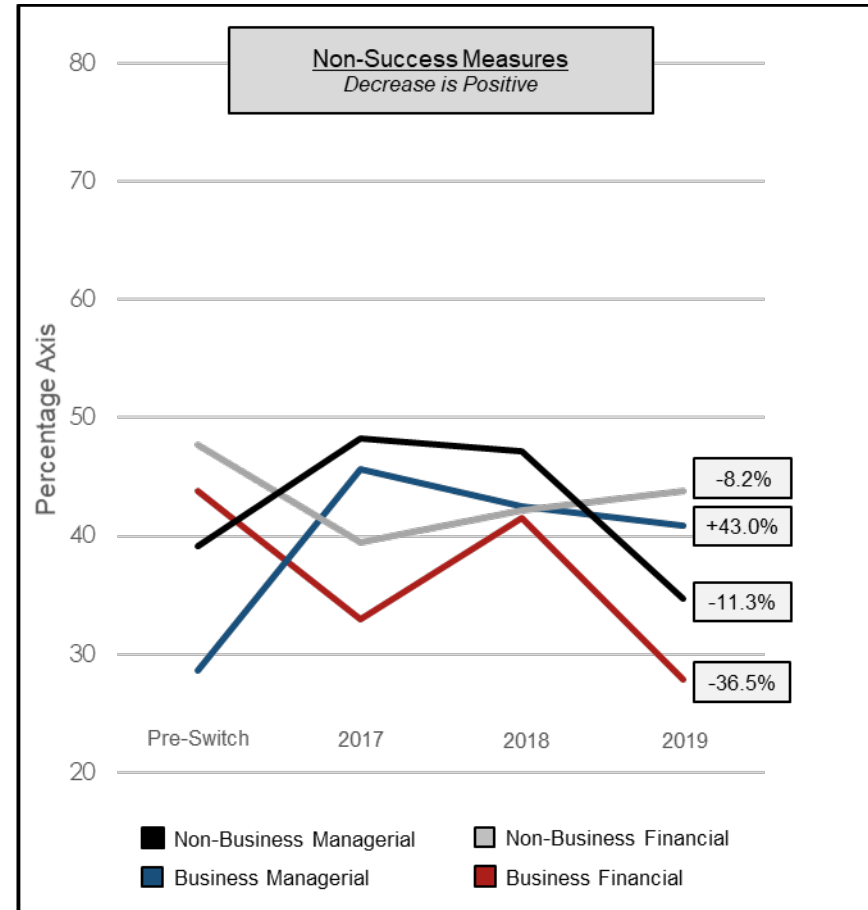
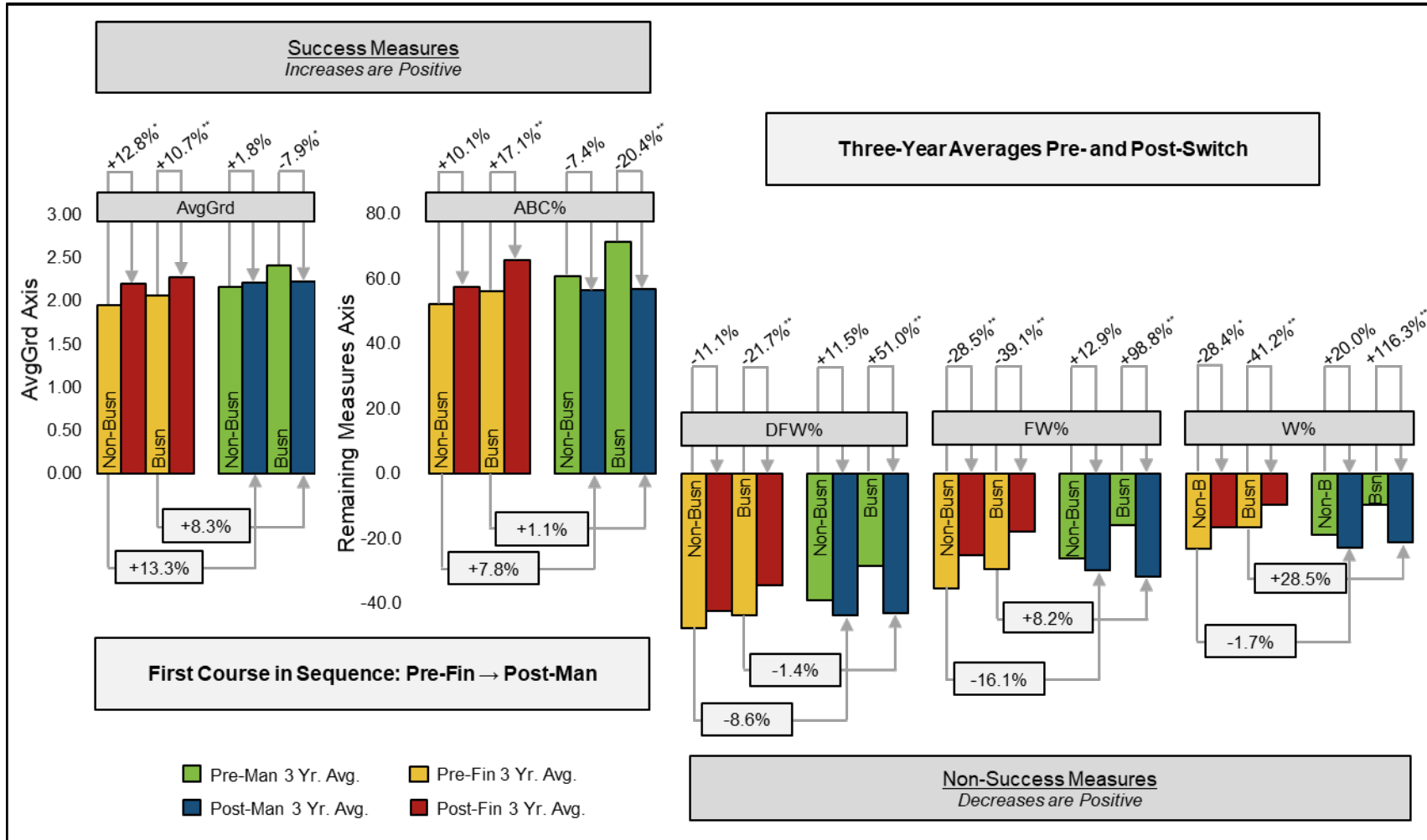


Figure 5C

Comparison of Non-Business & Business Majors' Performance Pre- and Post-Switch (Above Bars) and Comparison of Non-Business & Business Majors' Performance in First Accounting Course Pre- and Post-Switch (Below)



*p < .05
 **p < .01