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Senior Level Accounting Course Performance and the Timing of Completing Intermediate Accounting II

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Abstract

This study examines whether student performance in senior level accounting courses is a function of how soon the course is taken after Intermediate Accounting II. The classes considered at the senior level are Advanced Accounting, Auditing, and Senior Seminar (the Capstone Experience). The results indicate that course sequencing does influence performance in the senior-level courses. The grade received in the senior level accounting courses is adversely affected by the length of time between that course and Intermediate Accounting II for both Auditing and Advanced Accounting, but not for Senior Seminar. Other control variables that were found significant in determining student performance in senior-level courses were the student=s grade in Intermediate Accounting II and overall GPA.ACT scores were shown to not significantly influence the grade received in the senior level accounting courses. These results have implications for student course sequencing through their program and for advising of students..

Key Words: Student Success Factors, Course Sequencing, Senior-level Courses, Accounting Program

I. Introduction

Recently, society has been placing an increased emphasis on the accountability of universities for student performance as evidenced by the attention given to such metrics as retention rates, graduation rates, and placement rates. The completion of the college program within four years has also become an important metric (Carey, 2009).

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State funding models are taking some of these metrics into consideration in determining how the budget is allocated among state institutions (ADemand Accountability@, 2013).Governing boards increasingly look for data on assessment of student competencies, and accrediting bodies have increased the emphasis on assurance of learning (Brint, Proctor, Murphy, Turk-Bicakci, & Hanneman, 2009). Therefore, universities should strive to have in place features that help students achieve the levels of learning expected by assessment measures, complete their education in an appropriate length of time, and find meaningful employment after graduation. University funding and rankings are influenced by these measures. In this modern higher education environment, student success is becoming more of a necessity than a goal for universities (Meyer, 2012).

High student performance is a key component to many of the metrics being used to evaluate universities. Measuring student performance is a multi-faceted variable. Two measures that can be used are time-to-complete program and grades. Student grades and completion rates are a function of many factors including aptitude, effort, and course sequencing. This paper seeks to contribute to the understanding of student performance by examining student grade performance in relation to course sequencing while controlling for other influential factors.

Specifically, the paper will examine whether the length of time between taking Intermediate Accounting II and the required 400-level courses (Advanced Accounting, Auditing, and Senior Seminar) influences the grade received in the senior level courses. All of these senior level courses rely on some level of understanding of the topics covered in Intermediate Accounting II. However, the extent of reliance on the information varies among the senior level courses. Because of some reliance on knowledge, though, and students should earn higher grades in senior level courses taken sooner after Intermediate Accounting II. Students, however, take varying lengths of time between these courses. The delays in taking a course can be for numerous reasons, but students who score highly on an assessment of procrastination have been shown by Wesley (1994) to have lower college GPAs. Therefore, an empirical examination of the relationship between time between taking related courses and performance is warranted.

The results of this study can be used to help advice students regarding course selection. Course sequencing prepares students to better understand subsequent material. Understanding the relation between time lags and student performance can aid in program design and student advising, with the ultimate goal of increased student performance as measured by GPA and on-time completion rates. The results will also expand the literature in accounting education which has looked extensively at the determining factors that influence performance in sophomore-level courses and junior-level courses but has only limited examination of the factors that influence the performance in senior-level courses.

Learning more about these success factors can benefit accounting academics in understanding how to maximize the success of our students; and by so doing, potentially increase the university budget or academic ranking. Having a better understanding of any factors that inhibit student success in degree completion (course sequencing) is important for helping the academic community to better advice students as they progress through their accounting program. This improved understanding of any impediments to completion of the degree can also improve graduation rates and four-year completion statistics for accounting programs.

The following section examines existing literature on accounting student success factors. This section is followed by a discussion of the research design. The results are then presented. The final section provides a summary and conclusion.

2. Background

Astin (1999) defines student involvement as Athe amount of physical and psychological energy that the student devotes to the academic experience@ (p. 518). Astin=s (1970) Input-Environment-Output College Impact Model has been used in numerous studies of student engagement, commitment, or achievement (Strayhorn 2008).Inputs are the personal characteristics the student brings to the educational experience. The environment refers to a student=s actual experiences during their education. Outputs are the outcomes of the educational experience (Thurmond and Popkess-Vawter, 2003). Ahmad, Anantharmaman, and Ismail (2012) model professional commitment of accounting students as a function of motivation, perceived environment, and involvement. They reviewed several other applications of the Model as well.

This study applies this model by looking specifically at the environmental factor of course sequencing, while controlling for other known important environmental factors, on a student=s output as measured by grade performance in the senior level courses. This study will focus on student ability as the primary input, modeled by ACT score.

The environmental experiences considered are effort, modeled by overall GPA, prior accounting knowledge, modeled by the grade the student received in Intermediate Accounting II, and course sequencing, modeled by the lag between Intermediate Accounting II and senior-level courses. The outputs considered in this study are the grades that students receive in the senior-level accounting courses. Delay in completing course work is viewed as an interruption in the learning process of the accounting discipline that is expected to reduce student achievement (Portrat, Barrouillet, & Camos, 2008).

This reduced performance rests on the generally known fact, that all ideas, if left to themselves, are gradually forgotten (Ebbinghaus, 1885).Students will slowly forget knowledge obtained in previously taken accounting courses as they prolong the length of the accounting program. The senior level courses considered in this study rely to varying degrees on prior knowledge gained in the accounting program. Therefore, course sequencing that leaves more time between courses could be associated with lower performance in the senior level courses (Wilkins & Rawson, 2010).

Extensive literature exists on the factors that influence accounting student performance in various classes. The focus of this literature has been on success in principles courses and Intermediate Accounting I. There is limited literature that has examined the success factors for senior level courses. A review of the most relevant studies follows.

Bouillon and Doran (1990) examined factors that lead to success in Accounting Principles I and Accounting Principles II courses. They found that ACT scores, current college GPA, high school accounting, and majoring in accounting all had a positive relationship with performance in Accounting Principles I. For Accounting Principles II, ACT scores, current college GPA, and grade in Accounting Principles I all had positive impact on performance.

A number of studies have looked at issues involving success for Intermediate Accounting I.A number of programs have developed a diagnostic exam that is given to students before or at the beginning of Intermediate Accounting I that determines the amount of knowledge retained by students. Danko-McGhee, Duke, and Franz (1992) found that student GPA, Financial Accounting Principles grade, and a diagnostic test score were all significant positive factors in determining success in Intermediate Accounting I. Hicks and Richardson (1984) found that diagnostic test scores, overall GPA, and GPA in the accounting principles class were all determining factors in success in Intermediate Accounting I. Delaney, Keys, Norton, and Simon (1979) also found that a diagnostic test score and the grade in Principles of Accounting II were significant success factors. All of these studies show that student college performance to date, performance in prior accounting courses, and retention of prior accounting knowledge are important to success in the next level of accounting classes.

Al-Twaijry (2010) examined performance in the managerial sequence of courses. Positively correlated success factors for Managerial Principles were high school grades, high school math scores, Financial Accounting Principles grade, and number of college credit hours, current college GPA, and major in accounting. For Cost Accounting, high school grades, Managerial Accounting Principles grade, current college GPA, and accounting major were all significant success factors. Advanced Managerial Accounting performance was positively correlated with high school accounting, Financial and Managerial Accounting Principles grades, and current college GPA. These results were all for simple regression. The author did not perform multiple regressions so it is unclear whether some factors would drop out as other factors are considered. However, the results show again that student ability (current and/or high school GPA) and performance in previous accounting classes, as well as commitment (majoring in accounting) are important indicators of student success in later accounting courses.

Norton-Welsh and Reding (1992) examine average grades for all required courses as the independent variable rather than just one course. They used ACT scores, GPA in pre-business courses, diagnostic test score, gender, and transfer status as dependent variables. They found significant positive correlations for GPA and diagnostic test score, again stressing the importance of overall college aptitude and retention of accounting knowledge for doing well in the entire program.

Another study that examines upper level courses is Maksy and Zheng (2008).The focus of this study is student performance in Advanced Accounting and Auditing using students=self assessed motivation, student ability, and distracters (such as work) as independent variables. The authors found that motivation as measured by expected grade in the class and ability as measured by overall GPA and Intermediate Accounting II grade were significant determinants of performance in both Advanced Accounting and Auditing. These results show the importance of Intermediate Accounting II to performance in these upper-level courses.

Clark and Latshaw (2012/2013) argue that the performance studies in accounting use independent variables with high correlations. They advocate using progressive regression models to allow for determining all significant variables. In this study, student performance was measured by final percentage less the homework score in the first accounting course. The independent variables considered were overall GPA, learning/teaching style agreement, student learning style, gender, SAT math score, SAT verbal score, class attendance, and homework score. The full model regression showed overall GPA, student learning style, and SAT math score to be significant. Because of high correlations, the progressive regressions also determined that homework scores were significant when GPA was removed and that SAT verbal scores significantly influenced GPA and class attendance significantly influenced homework scores. These results do indicate the need to consider correlation of independent variables to find all factors that influence classroom performance.

As noted by this literature review, the literature examining success factors at the senior level accounting courses is less extensive. It is not empirically clear that the same factors would influence performance at the senior level as earlier in the student=s program. As student's progress through the accounting program, loss of majors occurs.

As the literature above indicates, success factors at the principles level and junior level are not identical. Success implies students high in the success variables moved on while some of those students with low levels of significant independent variables fall out of the program and are no longer subjects in the academic study. The input and environmental factors that lead to positive output outcomes in the Astin (1970) model become more homogenous in the students being studied as the course level increases.

As a result, it is an empirical question whether the input and environmental success factors for principles level and junior level courses hold as success factors for senior level courses. Expanding our knowledge of success factors in senior level courses can, therefore, help accounting academics to better understand how to help students become more successful in senior level courses, improving performance measures of those students and ultimately performance for the discipline and the university on standardized measures used as inputs to funding and other constrained resource (faculty lines, etc,) models. For instance, if it is determined in this study that course sequencing is in fact an important environmental factor in student success in senior level courses, then faculty, through advising, can influence student success and potentially improve student major GPA and on-time completion rates for the major.

The papers referenced that looked at senior level performance both have limitations. Al-Twaijry (2010) failed to consider multiple regressions and Masky and Zheng (2008) rely exclusively on self-reported data for independent variables. Likewise, course sequencing has not been considered in these studies. Thus, the current study contributes to the literature in accounting education by addressing issues of success factors in senior-level courses and adding the examination of course timing. The importance shown in other studies on the performance in prior accounting courses (as demonstrated by grades) and the retention of knowledge from prior accounting courses (as demonstrated by diagnostic test score) implies a relationship should exist between knowledge from Intermediate Accounting II and the performance in senior level accounting courses. Retention of knowledge is a function of the recency of exposure to and use of that knowledge (Ebbinghaus, 1885; Portrat, Barrouillet, & Camos, 2008; Wilkins & Rawon, 2010).Therefore the hypothesis for this study is: Student performance in senior level accounting courses will decline the longer it is between taking the senior level course and Intermediate Accounting II.

3. Methodology

To examine the relationship between performance in senior level accounting courses and the length of time since taking Intermediate Accounting II (the course sequencing environmental factor), the grades in Intermediate Accounting II, Advanced Accounting, Auditing, and Senior Seminar as well as the semester that each course was taken were gathered from student transcripts.

These courses were chosen because all three senior level courses have Intermediate Accounting II as a prerequisite. Because of this, a relationship between Intermediate Accounting II knowledge and senior level course performance would be expected. Other input and environmental factor variables considered are Intermediate II grade (an environmental construct of accounting discipline knowledge), overall GPA (academic effort environmental variable), and ACT score (input measure of intelligence), which were obtained from student transcripts.

These data points were acquired for all students attending the author's= university from fall 2001 through spring 2012.This time period was chosen to maintain stability in course design and instructors. While there were changes in the courses during this time, the basic structure (case study, lecture, etc.) was constant. During that time period, 439 students completed Intermediate Accounting II.Of these students, 385 completed the accounting program. Of the students completing the accounting program, 30 students had incomplete data (mostly missing ACT scores because of transfers).Five students were eliminated from the data set because the length of time to complete the program represented outliers (more than 5 years between Intermediate Accounting II and the last course).Therefore, the study is based on the 350 students completing the program with all of the data for the regression analysis.

Table 1 shows the descriptive statistics. As can be seen from the table, most students take Advanced Accounting and Auditing the semester following Intermediate Accounting II and Senior Seminar two semesters following Intermediate Accounting II. However, some students take considerably longer as seen by the maximum of 8 semesters between Intermediate Accounting II and the senior level courses. Multiple regressions was used to regress the number of semesters between Intermediate II and the senior level course of interest, Intermediate II grade, overall GPA, and ACT score on the grade received in each senior level course (Advanced Accounting, Auditing, and Senior Seminar) individually.

The coefficient on the semester lag variable is the coefficient of interest to test the hypothesis. The other variables are included as control variables since they have been shown in prior studies to be relevant explanatory variables for performance in courses.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Median	Minimum	Maximum
Semester Lag Intermediate II to Advanced	1.48	.86	1.00	1.00	7.00
Semester Lag Intermediate II to Auditing	1.31	.71	1.00	1.00	7.00
Semester Lag Intermediate II to Senior Seminar	1.85	.89	2.00	1.00	8.00
Intermediate II Grade	2.80	0.80	3.00	1.00	4.00
Advanced Grade	2.35	1.09	2.00	1.00	4.00
Auditing Grade	2.67	0.81	3.00	1.00	4.00
Senior Seminar Grade	3.01	0.68	3.00	1.00	4.00
GPA	3.27	0.45	3.32	2.12	4.00
ACT	23.25	3.89	23.00	10.00	32.00

4. Results

Table 2 shows the results of the three regressions. The hypothesis that length of time between Intermediate Accounting II and success in the senior level accounting courses was shown to be negative and significant with respect to Auditing and Advanced Accounting, but not with Senior Seminar. This finding supports the hypothesis with respect to these two classes. With respect to the control variables, all models showed a significant positive coefficient with Intermediate II grade and overall GPA. All models were significant and the models for Advanced and Auditing had reasonably high adjusted R-squared percentages, indicating that the models explain nearly half of the variability in grades.

Table 2: Multiple Regression Results
Grade in Senior Level Course

	Advanced Grade		**Auditing Grade**		**Senior Seminar Grade**	
Variable	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat
Constant	-2.449	-6.86***	-1.149	-4.43***	0.368	1.52
Semester Lag	-0.091	-1.75**	-0.075	-1.61**	-0.011	-0.33
Intermediate II Grade	0.361	5.57***	0.116	2.36***	0.061	1.32*
GPA	1.227	10.09***	1.032	11.39***	0.753	8.88***
ACT	-0.002	-0.66	0.007	0.77	0.001	0.09
F		72.62***		68.76***		37.13***
Adjusted R-squared		45.1%		43.7%		29.3%

*10% significance
**5% significance
***1% significance

The model for Senior Seminar, while significant, has a much lower adjusted R-squared, indicating that the model is missing other explanatory variables. While having Intermediate Accounting II and other accounting courses as a prerequisite for the Senior Seminar, it is probably the course that relies least on prior accounting knowledge of the three senior level courses considered. The Senior Seminar is focused on ethics and corporate governance more than applying discipline specific accounting knowledge. The material covered is within an accounting setting, but often does not require the student to remember a specific factual accounting application. The make-up of the Senior Seminar content may help explain why the results showed an insignificant relationship between course sequencing and performance.

Overall these results are similar to the results shown in the literature for success in other courses. Student performance in college as measured by overall GPA and performance in prior accounting courses, specifically Intermediate Accounting II, were both shown to be significant in all models. ACT was not significant in these models despite often being significant in the studies referenced. However, as noted earlier, as students progress through the program, it would be expected that success factors found in studies focused on early program success could become insignificant because successful student=s performance on these factors become increasingly similar.

Thus, by the senior level, accounting majors left in the program may all have levels of the input variables that allow for success and variability of performance at this level is explained by environmental variables which are more under the student=s control. The main environmental variable of interest, the semester lag between Intermediate Accounting II and the grade earned in the senior level course, is a construct of retained knowledge in a specific prerequisite course. This variable was significant in two of the three models. Again showing the importance of major specific knowledge to success in the senior level courses. The lack of significance of the semester lag variable for the Senior Seminar combined with the low significance of the Intermediate II grade indicates that despite Intermediate II being a prerequisite for the Senior Seminar, content knowledge from Intermediate II is not as relevant for performance in the Senior Seminar course as it is in Auditing or Advanced.

The results did support the research hypothesis in two of the three regression models. Therefore, taking senior level accounting courses as soon as possible after completing Intermediate Accounting II will improve grades in those senior level courses. This finding can be used to improve advising to help students attain higher performance in senor level courses and increase the number of students completing degrees on a timely basis.

5. Conclusion

This study used multiple regression analysis to examine success factors for senior level accounting courses, testing Austin=s (1970) Input-Environment-Output College Impact Model. The results showed that the grades in senior level accounting courses (the outputs) are significantly associated with environment factors the student brings to the educational process.

Specifically, success in senor level courses was shown to be positively associated with overall GPA (a construct of scholastic effort) and grade in Intermediate II (a measure of prior accounting knowledge)and negatively associated with the length of time since taking Intermediate Accounting II (course sequencing measure).These results reinforce the importance of doing well in prior accounting courses and taking related courses as soon as possible after prerequisite courses in order to succeed in later courses. Accounting by nature is a cumulative field, thus students use knowledge gained in previous courses regularly.

These results help to statistically quantify this reliance upon and importance of prior learning. The results also extend the literature examining success factors for accounting courses. Semester lag between courses has not been considered in other studies, but it is a construct for retained knowledge which has been measured using diagnostic test scores in the papers examining success in Intermediate Accounting II (Delaney, Keys, Norton, & Simon, 1979; Hicks and Richardson, 1984; Danko-McGhee, Duke, and Franz, 1992) and the accounting program as a whole (Norton-Welsh and Reding, 1992).Overall GPA, GPA in prior courses, or major GPA has also been shown as an important factor in all previously referenced studies. The current study confirms this finding of importance of scholastic effort in success.

The results of this study show that for programs of study to achieve higher major GPA and better on-time graduation statistics, advising should stress taking classes as close in time to the prerequisite courses as possible. Course sequencing is an important factor in student success. This relationship should be used to benefit both the student and the program in the current environment of scarce resource allocation.

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