Modeling Indicators of Success in Intermediate 1 In the Post Rules-Based Paradigm

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ABSTRACT

Watson et al. (2007, p. 22) call for empirical research in accounting education that studies the effectiveness of different curriculum models. The present research answers this call by developing a model to identify potential indicators of success in Accounting. Frakes (1977) presented a model prior to the shift in the mid-2010s from principles-based" accounting standards following years of "rules-based", but no model has been developed or empirically tested following the shift. The present study fills the void by developing a model for future researchers.

A model to identify indicators for success in Intermediate Accounting I has academic and professional implications. Regarding academic implications, the fear is that students who are not provided with initial indicators (i.e. not fundamentally sound) may obtain a degree but view the university as doing them a disservice if they are unable to find employment in their field. Regarding professional implications, students deemed to have command of the foundational principles of accounting may progress through the accounting ranks faster. This benefits companies, who are able to select highly qualified interns earlier in the student's academic career. This relationship may lead to a partnership between the company and former interns who are socialized to the norms of the accounting profession.

Keywords: Intermediate Accounting Education, Accounting Competency Exam

INTRODUCTION

Nearly five decades have passed since Frakes (1977) identified potential indicators for success in Intermediate Accounting I. Some studies has continued this stream of research (Delaney et al. 1979; Hicks and Richardson 1984; Ward et al. 1993); however, the literature has not converged on definitive indicators for success in Intermediate 1. Sanders and Willis (2009, p. 332) document that their Principles of Accounting Competency Exam (PACE exam, hereafter) resulted in more fundamentally sound Intermediate 1 students as well as higher quality students enrolled in post-Intermediate 1 courses. Following Frakes' (1977, p. 210) suggestion for future research in this area, the current study reviews the literature to identify potential indicators or success in order to develop a model for future empirical testing. This model may be of interest to accounting educators, accounting students and the profession for a number of reasons.

One, several paradigm shifts in accounting methodology have occurred since the research performed by Frakes (1977) and Sanders and Willis (2009). For example, a major change in accounting philosophy is related to the recent shift to "principles-based" accounting standards following years of "rules-based" standards when accounting for revenues and leases. This requires different skillsets from students to be successful in accounting compared to the skillset needed in Frakes' (1997) study and Sanders and Willis' (2009) study. Therefore, it is imperative to improve Frakes' (1977) model in order for present a model with more explanatory power regarding indicators that predict success in Intermediate 1.

A second reason to investigate the PACE exam is understand whether it is considered to be an "gatekeeper exam" into the accounting major or whether the exam signals academic readiness for accounting majors. While both reasons are legitimate, the adverse effects of the exam not serving as an indicator of success in the course may have negative consequences. For example, students who fail the course may incur an economic outlay to retake the course. A more drastic downfall of inadequate preparation would be for the student to abandon the accounting major, which may result in false narratives regarding the complexity associated with accounting.

A third reason to understand whether the exam promotes academic readiness is to assess whether students who complete their accounting programs at two-year colleges are prepared for Intermediate 1 at four-year colleges. Accounting literature has not converged on whether the source from which students complete their Principles of Accounting education is indicative of their Intermediate 1 performance (Colley et al. 1996; Huang et al. 2005; Sanders and Willis (2009); Jones et al. 2013). The present study presents an argument for evaluating transfer students versus nontransfer students' indicators of success using a PACE Exam.

The next section reviews the literature which examines indicators of students' success in Intermediate 1 and the PACE exam. Section III develops a model for future empirical testing, followed by a conclusion in Section IV.

LITERATURE REVIEW

Intermediate Accounting PACE Exams (Overview)

The ability of the PACE exam to serve as an indicator for success in Intermediate 1 remains unresolved. Several exam formats have been used by various universities for diverse purposes. The American Institute of Certified Public Accountants (AICPA) Level 1 Exam has been used to predict the success of students transferring from another university (McCormick and Montgomery, 1974). Similar results were achieved in Buehlmann's (1975) study. However, Ingram and Petersen (1987) does not support these results when other variables are considered.

Delaney et al. (1979, p. 156) championed the use of university-specific Intermediate 1 entrance exams as a mechanism that may increase the quality of Intermediate 1 students.[1] Frakes (1977) details a university-specific accounting competency exam administered to students enrolled in Intermediate 1 at a major Northwestern University, with results supporting the usefulness of pre-Intermediate 1 exams. Hicks and Richardson (1984) extend Frakes' (1977) research and identify the following indicators for success in Intermediate 1: an PACE exam covering the basic accounting cycle, students' principles of accounting GPA, and to a lesser extent, students' overall GPA.

The present research proposes elements of an internal PACE exam developed by a comprehensive, teaching and research intensive university in the Southeastern United States. This exam was motivated by Sanders and Willis (2009), who developed the exam to increase student retention in the program, to foster timely completion of the accounting program, and to serve as a prerequisite prior to enrolling in Intermediate 1. The exam also addressed the following topical weaknesses identified by faculty teaching Intermediate 1:

The Accounting Equation	Elements of the Financial Statements
Recording/Journalizing Business Transactions	The Preparation of Adjusting Entries
Understanding the Closing Process and Making Closing Entries	Understanding the Posting Process and Preparation of a Trial Balance

The PACE exam is designed to be a two hour exam. Part 1 is the theoretical portion of the exam which consists of 23 questions, and accounts for forty percent of the total exam score. Part 2 consists of the practical portion of the exam, which is designed to ensure students have a fundamental understanding of both the accounting cycle and the necessary skillset to journalize basic accounting transactions. Students are allowed to take the exam a maximum of three times in order to achieve a passing score of seventy-five percent prior enrolling in Intermediate 1.

Intermediate PACE exam (Research Question)

With the exception of Frakes (1977), research has scarcely examined the relationship between (a) the *objectives* being assessed on the PACE exam and (2) the exam's ability to

[1] Delaney et al. (1979) notes that Northern Illinois University's accounting competency exam was implemented to accommodate transfer students whose accounting curriculum did not cover the financial and managerial accounting assessed by the AICPA Level 1 exam.

predict Intermediate 1 performance, which poses at least one major problem. The anecdotal assumption that the *composite* exam predicts performance without considering the correlation of (a) the *objectives* assessed on the exam with (b) the *objectives* taught in Intermediate 1 may result in several negative consequences. Chiefly, students whose level of preparedness for the course is not on par with other students may slow the progress of the course if some students possess weak fundamentals of accounting, which frustrate faculty. Students may also retake the course if they are not fundamentally sound in accounting, which may lead them to self-select themselves from the major. In summary, if the objectives of the exam are not correlated with objectives in Intermediate 1, it will not serve as an indicator for success in Intermediate 1, and students will be under-prepared for this rigorous course. The following research question addresses these concerns:

> Research Question 1:
> Does correlation of the objectives of the PACE exam with the objectives of Intermediate 1 serve as an indicator to predict success in Intermediate Accounting. If so, which objectives are more highly correlated with higher performance in the course?

Source of Accounting Prerequisites

Frakes (1977, p. 209) suggests that more informed decisions regarding student admission into Intermediate 1 would require consideration of accounting competency exams, students' general ability, and demographic variables. The present study proposes that the institute of higher learning from where students receive principles of accounting training may be a more important indicator of success that may or may not be captured by a PACE exam.

Predicting whether the school from which a person learned principles of accounting serves as an indicator of success in Intermediate 1 is complex, because very little directly germane research exists. Two lines of reasoning can be advanced regarding this empirical question. The most sinister scenario may occur when students who complete their Principles of Accounting prerequisites from a two-year college are inadequately prepared for Intermediate 1, as proposed by Sanders and Willis (2009, p. 321) after being partially confirmed by Colley et al. (1996) but not by Huang et al. (2013, p. 243) An attribution of low Intermediate 1 performance could most easily be reached when students' accounting prerequisites are acquired from a two-year college in the absence of a PACE exam prior to Intermediate 1.

A less pessimistic possibility is that Intermediate 1 performance is lower when students *pass* a PACE exam (passing the exam generally signals readiness for Intermediate 1). Consistent with the attribution theory, this line of reasoning suggests the following: if poor performance in Intermediate 1 cannot be attributed to a low fundamental knowledgebase (which is assumed to be adequate when the student successfully completes the PACE exam), then by default the Principles of Accounting education received from the two year college must be awarded a greater share of the blame for poor performance in Intermediate 1. This line of reasoning suggests that the PACE exam's predictive ability of Intermediate 1 performance may rest on (1) where students complete their Principles of Accounting training, or (2) students' ability to adapt their critical thinking skills to a level that is necessary for success in Intermediate 1. Stated differently, it is unclear whether the PACE exam and the type of college where students completed Principles of Accounting impact Intermediate 1 performance serve as a main effect or as an interaction effect. This nondirectional research questions summarize this argument:

Research Question 2: Is success in Intermediate 1 a joint product of the PACE exam and the location where the student completed their Principles of Accounting prerequisites? And, if so, what is the nature of the interaction?

MODEL DEVELOPMENT

The model in this study extends Frakes' (1977) model to include the source of students' Principles of Accounting prerequisites (two-year college; four-year college).

Dependent Variable (Performance Measure)

Student performance in Intermediate 1 is proposed to be assessed using students' mean test scores (not mean averages for the course), which is consistent with prior research (Kealey et al. 2005, p. 37; Raimondo et al. 1990, p. 375). The use of actual test scores provides a richer measure of learning in the course, compared to the students' course grades, since course grades often include assignments that are used as "built-in" mechanisms to improve students' grade. This variable is motivated by Raimondo et al. (1990, p. 374), who note that different grading scales may be used in a course, either due to the same instructor using a different scale, or a different instructor using a different scale.

Independent Variables of Interest

PACE Exam

Student performance on the PACE exam is the variable of interest in this study. Although students must meet a score of seventy-five percent in order to pass the exam, the PACE exam is measured on a pass or fail basis.[2] Since students are provided multiple opportunities to pass the exam, it is important to control for the proficiency gained by the students who were administered the exam on more than one occasion.

Source

Research in other business courses finds that students who take their initial principles course at a two-year college performance is not a significant factor in their Intermediate Economics performance, but it is significant in their Intermediate Business statistics performance. Regarding accounting courses, Sanders and Willis' (2009, p. 321) student-reported assertions indicated that those who received their Principles of Accounting at a two-year college were not prepared for the accounting at a four-year college. Colley et al. (1996) find that nontransfer students' Principles of Accounting performance had a significant impact on Intermediate 1 performance. However, the results were different for transfer students from two-year colleges in at least two studies (Huang et al. 2005; Jones et al. 2013, p. 243). Therefore, this study proposes that students from two-year colleges are likely to have lower Intermediate 1 performance.

Control variables

[2] Successful completion of the course (exam) is defined in this study as a student having achieved a score of seventy-five or higher for the course (exam), consistent with the CPA Exam passing score.

ACT Scores (Academic Ability)

Ward et al. (1993, p. 240) suggest that the decomposition of the Composite ACT score into students' Math and English components are necessary to account for the level of quantitative and written communication necessary for success in Intermediate 1. Their research finds a positive and significant association between students' Intermediate 1 performance and their Math ACT scores *and* Composite ACT scores. Kealey et al. (2005, p. 42) find that students' ACT Math score (ACTMATH) is significant in explaining the increase in accounting majors' critical thinking performance, which were found to be necessary for students in Principles in Accounting. Since ACTMATH is positively and significantly associated with students' critical thinking ability, this model suggests that this relationship holds in Intermediate 1 performance.

Time

The utilization rate variable (TIME) was employed by Raimondo et al. (1990, p. 375) as a proxy for the amount of time available for students to devote to learning, finding a positive and significant relationship between student status and Intermediate performance. Frakes (1977) employed course load hours in lieu of full- and part-time status, a measure utilized in the current study.

Human Capital

Whereas Raimondo et al. (1990) use GPA as a measure of human capital, this measure does not take into account the level of maturity of students enrolled in the course. In some cases, nontraditional students have returned after a layoff from college, whereas some students become more serious about learning at different rates than other students.

Employment status

This variable is employed to understand whether students worked or did not work during the semester in which they were enrolled in Intermediate 1. With the increase in higher education costs, more students must work to support their college tuition. Frakes (1977, p. 207) found work experience to be a significant indicator for success for those likely to transfer from a two-year college, but not for nontransfer students.

Major

Frakes (1977) accounts for students' motivation to do well by capturing the students major. His study does not find that accounting majors are more likely to have a higher rate of success than nonaccounting majors. However, Jones et al. (2013, p. 242) finds this relationship to be significant. Therefore, the current study hypothesizes the same relationship between student major and Intermediate 1 performance. The expectation is that accounting majors' performance will be significantly higher than non-accounting majors' performance.

Demographic Variables

Frakes (1977) finds that only three of the eight demographic variables examined in his research were significant (age, sex, marital status), and thus are included in the model for future examination. Equation 1 presents a proposed model for empirical examination along with other factors identified as indicators for success in the literature, as follows:

Equation 1: Model to predict student success in Intermediate Accounting.

$$\begin{aligned} \text{PERFORMANCE} = {} & \alpha + \beta_1 \text{ PACE} + \beta_2 \text{ PACECOMPONENTS} \\ & + \beta_3 \text{ ACTCOMP} + \beta_4 \text{ACTMATH} \\ & + \beta_5 \text{ TIME} + \beta_6 \text{GPA} + \beta_7 \text{MAJOR} \\ & + \beta_8 \text{AGE} + \beta_9 \text{SEX} + \beta_{10} \text{STATUS} + \varepsilon \end{aligned} \quad (1)$$

Additional variables identified from the Frakes (1977) and other accounting literature that may be considered indicators of success in Intermediate 1 are as follows:

- Socialization (Wilson 2014) towards norms of the profession has been examined in other accounting courses. With an increase in non-traditional students, it is possible that some students who have only taken the principles of accounting courses may actually be more socialized to the norms of the profession than others, especially if they have experience working in accounting or business. This indicator should be examined to see its impact on Intermediate Accounting performance.
- Student Cognitive Load (Wilson et al. 2021) was found to be a significant indicator of success in a second principles of accounting course (Managerial Accounting), but not in the first principles course, which research finds to be correlated with success in Intermediate Accounting. Future research may explore the impact of Cognitive Loads in financial accounting.
- Average score per component of the PACE exam (Sanders and Willis 2009)
- Student Major PACE exam score (Sanders and Willis 2009)
- Number of hours taken when enrolled in Intermediate 1 (Kealey et al. 2005)
- Cumulative GPA as of the time the student took the course (Frakes 1977)
- Hours worked during semester enrolled in Intermediate 1 (Frakes 1977)
- Post graduate employment and/or graduate school and various demographic factors (gender, race, age).
- Number of times enrolled in Intermediate 1: not identified in the literature, but many schools have a cut-off on number of times a student may repeat the course before being forced to leave the major.

CONCLUSION

This paper develops a comprehensive model for future empirical testing in order to objectively identify indicators for success in Intermediate Accounting. Since Frakes' (1977) seminal research was performed, several changes in accounting regulations and paradigm shifts relative to points of emphasis in accounting delivery and student demographics has occurred. Therefore, the literature was reviewed to develop an extensive model in an effort to promote future research whose aim is to increase the preparedness of students entering Intermediate Accounting, a rigorous course that prepares students for the profession.

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