A Dissertation

entitled

A Study of Student Involvement Variables in Higher Education
Their Influence on Success on the Uniform CPA Examination

By

Linda M. Campbell

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the
Doctor of Philosophy Degree in Higher Education

____________________________________
Ronald D. Opp, Ph.D., Committee Chair

____________________________________
Stephen Ball, Ph.D., Committee Member

____________________________________
Diana Franz, Ph.D., Committee Member

____________________________________
Brian Laverty, Ph.D., Committee Member

____________________________________
Patricia R. Komuniecki, Ph. D., Dean
College of Graduate Studies

The University of Toledo

May 2012
Accounting educators are continually seeking ways to better prepare their students for success after graduation. One path to this goal is the successful completion of the CPA exam. This national exam provides an endorsement of the knowledge and comprehension of the candidate and opens up opportunities for advancement.

The purpose of this study was to address the various academic factors that are hypothesized to have influenced performance on the CPA exam. This study focused on Ohio candidates who sat for the Financial Accounting and Reporting Standards (FAR) section of the CPA exam. This study applied Astin’s Theory of Student Involvement to understand how to improve the learning environment for accounting students. The Input-Environment-Outcome (I-E-O) model served as the conceptual framework in order to study the relationship between the inputs and the environment and evaluate their possible influence on the dependent variable - performance on the FAR section of the CPA exam.

This dissertation provided new, useful information for educators and administrators in their goal of promoting academic excellence.
For my parents, Attilio J. and Linda Frank, who believed in the process of setting goals and working hard to achieve them and for my husband, Jim, my soulmate.
Acknowledgements

This dissertation could not have been completed without the support that I received from so many people. I would like to take the time now to thank everyone who offered their time, advice, guidance, and help throughout this study.

In particular, I want to thank my husband, Jim, who encouraged me to enroll in the Ph.D. program and continued to believe in my ability to be successful. I also wish to thank the generous donors of the Russell Scholarship and the National Association of Campus Activities for contributing funding to this study. I could not have set up, or launched my survey without Sunday Griffith’s technical wizardry. I am grateful to my colleagues at Siena Heights University, especially, Donna Baker, Melissa Sissen and Wanda House, for their support and contributions. And of course my dissertation boot-camp buddies at the University of Toledo for their shared support and encouragement.

My committee members, Drs. Stephen Ball, Diana Franz and Brian Laverty, individually offered me their expertise and insight which made this a much more interesting and rewarding study. Each one of them generously shared their time, knowledge and advice for improvement on my study. Their contributions were invaluable. And finally Dr. Ronald D. Opp, my dissertation chair, who agreed to take on the direction of this research project, and stuck with me through countless hours and revisions. Without his professional advice, patience, and guidance this original research could not have been completed.
# Table of Contents

Abstract ......................................................................................................................... iii

Acknowledgements ....................................................................................................... v

Table of Contents ........................................................................................................ vii

List of Tables ................................................................................................................ ix

List of Figures .............................................................................................................. x

I. Introduction .................................................................................................................. 1
   a. Evolution of the Uniform CPA Exam ................................................................. 2
   b. Astin’s Theory of Student Involvement ............................................................ 4
   c. Background of the Problem ............................................................................. 5
   d. Statement of the Problem ................................................................................ 6
   e. Purpose ................................................................................................................ 7
   f. Research Questions ............................................................................................ 8
   g. Significance of the Study .................................................................................. 9
   h. Conceptual Framework ..................................................................................... 11
   i. Assumptions ........................................................................................................ 13
   j. Limitations .......................................................................................................... 13
   k. Glossary ............................................................................................................... 15
   l. Summary .............................................................................................................. 17

II. Literature Review ...................................................................................................... 18
   a. Background ........................................................................................................ 19
   b. Description of Astin’s Involvement Theory ....................................................... 19
   c. Research Application of the I-E-O Model ......................................................... 21
d. Reform of Accounting Education ................................................................. 23
   i. Accounting Education Change Commission (AECC) ............................. 24
   ii. Implementation of 150-hour requirement .............................................. 24

e. Research Studies on Variables Predicting Performance on the CPA ........ 27
f. Summary ................................................................................................... 41

III. Methodology ............................................................................................ 43
   a. General Survey Design Framework ....................................................... 43
      i. Astin’s I-E-O Model ........................................................................... 43
   b. Procedure .................................................................................................. 45
   c. Description of Blocks 1-7 ....................................................................... 47
      i. Multicollinearity Issues ....................................................................... 52
   d. Instrument .................................................................................................. 52
      i. Database for Participants’ Addresses .................................................... 53
      ii. Survey Design and Participants .......................................................... 54
      iii. CPA Examination – FAR Section ....................................................... 55
   e. Assumptions ............................................................................................... 55
   f. Summary ................................................................................................... 56

IV. Analysis of Data .......................................................................................... 58
   a. Data Collection and Response Rates ....................................................... 59
   b. Descriptive Characteristics of the Sample Population ............................. 61
   c. Carnegie Classifications of Respondents Institutions ............................ 63
   d. Program Characteristics ........................................................................... 65
   e. Dependent Variable .................................................................................. 66
f. Analysis and Findings ............................................................................................................ 67

g. Review of the Research Questions ..................................................................................... 68

h. Regression Model Predicting FAR Score ............................................................................. 69

i. Research Question Analysis ............................................................................................... 72

j. Summary ............................................................................................................................... 74

V. Discussion, Recommendations, and Conclusions ................................................................. 75

a. Summary of the Study ........................................................................................................... 75

b. Analysis and Findings .......................................................................................................... 76

c. Implications for Theory and Practice ................................................................................... 84

i. Implications for Theory ....................................................................................................... 84

ii. Implications for Practice .................................................................................................... 85

d. Limitations of the Study ....................................................................................................... 87

e. Suggestions for Future Research .......................................................................................... 89

i. Improving the Database/Survey .......................................................................................... 89

ii. CPA Review Course ............................................................................................................ 90

iii. Underrepresentation of Minorities in Public Accounting .................................................. 91

iv. Employment while in College ............................................................................................. 91

f. Conclusion ............................................................................................................................. 92

References .................................................................................................................................. 95
Appendices

Appendix A: Survey for CPA Candidates .........................................................100
Appendix B. Introductory Letter to Survey Population – Group 1.....................103
Appendix C. Introductory Letter to Survey Population – Group 2.....................104
Appendix D. Correlation Matrix.................................................................105
List of Tables

Table 1. Survey Results – Response Rate ................................................................. 59
Table 2. Gender and Race ................................................................................... 62
Table 3. Carnegie Classifications – Control, Selectivity, Size ...................................... 64
Table 4. Undergraduate Major by FAR Mean and Graduate Major by FAR Mean .......... 65
Table 5. Predictor Variables of FAR Score .................................................................. 70
List of Figures

Figure 1. I-E-O Model ..............................................................................................................13

Figure 2. Data Framework: I-E-O Model ..................................................................................46

Figure 3. ACT Frequency Distribution – Reported Scores......................................................61

Figure 4. FAR Score Frequency Distribution...........................................................................66
Chapter 1

Introduction

Accounting majors who have the goal of being a certified public accountant (CPA) must accomplish a series of academic, professional, and testing requirements. Each individual state has a State Board of Accountancy that sets all rules and regulations regarding the licensing of prospective and current CPAs. This includes educational requirements for prospective candidates for certification and requirements for eligibility to sit for the CPA exam.

Across the nation, there is some consistency regarding educational requirements. For example, 46 out of 50 states require 150 hours of higher education for public accounting certification. California (California Board of Accountancy, 2009) does not require 150 hours for certification and has no plans at present to implement this requirement. Colorado repealed the 150-hour requirement in 1999, and later confirmed this action 2004 during the Sunset Review by the Colorado State Board of Accountancy (Colorado State Board of Accountancy, 2004). However, Colorado is planning on requiring 150 hours for certification, effective 2015 (Becker CPA, 2011). New York recently updated their requirements for certification to include 150 hours or 15 years of acceptable accounting experience; but does not require applicants to have completed 150 hours in order to sit for the exam (NYSED, 2011). New Hampshire and Delaware also do not require 150 hours for certification (Becker CPA, 2011). As of December, 2011, a total of 30 states, plus District of Columbia and Guam, do not require 150 hours to sit for the exam (Becker CPA Review, 2011).
Passing the Uniform CPA exam represents a major milestone on the path to acquiring the CPA designation. The broad scope and rigorous nature of the exam require candidates to be proficient in both the theory and practice in the many areas of accounting. This exam serves as a benchmark to document that a candidate for certification has achieved an advanced level of knowledge of accounting.

There are a variety of professional paths for accounting graduates. Almost every organization requires the skills of an accountant in their daily routine. Positions in public, private, not-for-profit and governmental organizations are available. Many accounting positions do not require a CPA. Nevertheless, most accounting educators encourage their students to pursue certification in public accounting because of the advanced level of knowledge, credibility, and opportunity for advancement associated with the CPA. Accounting educators communicate expectations of what it takes to become a successful accountant throughout the students’ academic career. A connection between the classroom and the profession becomes more evident as students advance through the educational process. The educational environment grooms accounting majors for entry into the public accounting field by helping them build the foundation they will need to pass the CPA exam and to provide opportunities to apply accounting theory to practice. In addition, most accounting programs offer participation in various extracurricular activities involving the accounting profession.

**Evolution of the Uniform CPA Exam**

In 1987, The American Institute of Certified Public Accountants (AICPA) Board of Examiners began plans to revise the CPA exam. At that time, the CPA exam was administered over a two-and-a-half day period with five sections. Beginning in 1993, the
CPA exam was administered during a two-day time period with four sections – Practice and Theory was collapsed with its contents placed into two other existing sections (Zachry & Bettinger, 1992). For the first time, simple calculators were permitted to be used, and communication skills were assessed (Zachry & Bettinger). This revised format remained in effect through 2003. Candidates were required to pass all four parts within a three-year period. Since the exam was given twice a year, this gave candidates six opportunities to attempt the exam.

After more than five years of planning, the computerized-based format for the CPA exam was administered in 2004 during the first testing window of April 5th through May 29th (Holder & Babuin, 2004). Four annual 2-month testing windows are available, as compared with the previous two annual administrations of the test. Candidates are permitted to take one section of the exam at a time, as opposed to being required to sit for all un-passed sections with each attempt. Candidates still have six opportunities to sit for each section of the exam, if necessary, to pass all four sections of the exam within the mandated 18-month time period. If that deadline is not met, passing scores are removed, and the testing process starts over from scratch.

Revisions to content have been made to the exam as well to “more closely align with an entry-level CPA’s real-world professional responsibilities” (Holder & Babuin, 2004, p. 13) by including simulations or cases that test the candidate’s ability to perform research tasks and to use critical thinking skills.

The four parts to the exam are: Auditing and Attestation (4.5 hours); Business, Environment and Concepts (2.5 hours); Financial Accounting and Reporting (4 hours); and Regulation (3 hours). The passing score for each part is 75 (NASBA, 2006).
Astin’s Theory of Student Involvement

Alexander Astin’s theory of student involvement is based on the assumption that if students are involved with or committed to their education, they will achieve higher levels of success. Astin’s longitudinal research has tracked students’ developmental progress through their academic years. He uses the Input-Environment-Outcome (I-E-O) conceptual model to analyze the students’ development (Astin, 1993). The input variables are student characteristics, such as demographics and college entrance exam scores. The environment includes institutional characteristics, program, and involvement variables. The outcome is the measure of success, such as level of satisfaction, scores on standardized tests, or persistence. The outcome variables were found to be positively affected by higher levels of involvement (Astin, 1999).

In addition to the intense concentration on academic excellence, opportunities for participation in professional and academic activities nurturing interest in public accounting are available in most accounting programs. Applying Astin’s theory of student involvement to accounting students addresses the premise that students who participate or are involved more in their educational process will achieve greater success than others when attempting the individual sections on the CPA exam.
Background of the Problem

The number of accounting majors has been increasing in both undergraduate and graduate programs, but the number of students electing to pursue certification in public accounting has not kept up with the demand (Reigle, 2008). Requirements for sitting for the Uniform CPA exam in Ohio and many other states have been increased to 150 hours of higher education, which includes a minimum of 30 hours of accounting. Candidates’ performance on the CPA exam is used as one of the measures of auditor quality and technical competence (Allen & Woodland, 2006). Universities’ pass rates on CPA exams are viewed as one measure of the quality of their accounting programs (Barilla & Jackson, 2008). Allen and Woodland (2006) conducted a longitudinal study using data from 1991-2002 and included all candidates sitting for the CPA exam – both first-time and repeat candidates. Since the 150-hour requirement was a fairly new requirement, the number of candidates taking the CPA exam dropped off considerably during that time period. Their findings showed that the passing rate after the 150-hour requirement was initially implemented actually decreased. However, since that study, the number of candidates has increased, and the passing rate has increased as well.

The National Association of State Boards of Accountancy (NASBA) publishes an annual report that provides data on candidates’ performance on the CPA exam. According to their study (NASBA, 2009), the national pass rate for first-time candidates on the Financial Accounting and Reporting (FAR) section of the CPA exam in 2008 was 51.8%, up from 50.7% in 2007. The pass rate for repeat candidates on the FAR in 2008 was 44.8%, up from 43.6% in 2007 (NASBA, 2009). The pass rate for all Ohio candidates - both full-time and repeat - for the FAR section of the CPA exam was
50.31% (NASBA, 2009) – a little bit below the national average. Although these pass rates may seem high, the percentage of candidates who passed all four sections of the CPA exam in 2008 was 7.8% for first-time candidates and 2% for repeat candidates (NASBA, 2009). In 2008, 2,406 candidates sat for the CPA exam in Ohio. Of those candidates, only 404 took all four sections of the exam, and 165 of those candidates passed all four sections. These pass rates cannot accurately be compared with the pass rates of the paper-and-pencil format because the definitions of first-time and repeat candidates and the rules for calculating credit for passed sections differ. The computer format of the exam offers more flexibility in the administration of the test. Candidates may take one section at a time, allowing them to concentrate on one portion of the exam. The combination of the 150-hour requirement and the ability to concentrate on one section of the test at a time has contributed to increasing the pass rates on the individual sections of the CPA exam, but not necessarily the pass rates for the CPA exam as a whole (Carpenter & Hock, 2008).

**Statement of the Problem**

Educators are interested in continuously improving their accounting programs, and student performance on the CPA exam serves as one indication of the quality of the program. Uncovering the factors that lead to increased success on the CPA exam is of importance to accounting educators. The problem addressed is determining which institutional, program, and involvement variables present in Ohio universities and colleges are significant in contributing to student success on the FAR section of the CPA exam.
Purpose

The purpose of this study was to explore various academic factors that may or may not influence success on the Financial Accounting and Reporting Standards (FAR) section of the CPA exam. This study examined the scores of Ohio candidates - both first-time and repeat - who took the FAR section of the Uniform CPA exam and the effect of select variables present in higher education on student success on the FAR section of the CPA exam. Information gathered on candidates included student demographic characteristics and entrance exam scores that may have affected the students’ academic achievement. Additional information was researched concerning institutional, program, involvement variables, and intermediate outcomes. This information was analyzed using the Input-Environment-Outcome-Model (I-E-O) to determine what influence, if any, these variables have on the score on the FAR section of the CPA exam.

Previous research (Astin, 1993) indicated that success on standardized tests is influenced by a variety of involvement variables. These studies have shown that interaction with peers has a significant influence on success on standardized tests such as the MCAT, LSAT, and GRE. One of the peer group factors, Intellectual Self-Esteem, has time and again proven to be significant in influencing success on standardized tests. This study will test the utility of Astin’s involvement theory with accounting students in relation to their success on the FAR section of the CPA exam.

This study surveyed Ohio candidates who took the FAR section of the CPA exam during 2009 and the first half of 2010. Ohio was chosen for this study because it will provide a sample population rich in institutional diversity with over 50 public and private universities and colleges that offer accounting programs (Ohio Board of Regents, 2009).
Permission from Robert Joseph, Assistant Director of the Ohio State Board of Accountancy had been granted to use mailing addresses of candidates sitting for the exam in Ohio. The FAR section of the exam was chosen because it typically is the first exam that students take, requires the most preparation, and covers the basic principles of accounting for public, private, not-for-profit and governmental entities (www.nasba.org/nasbaweb).

**Research Questions**

The following research questions were addressed:

1. What student characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

2. What institutional characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) of the Uniform CPA exam?

3. What accounting program characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

4. What student involvement variables, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

5. What intermediate education outcomes, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?
Significance of the Study

This study is particularly important given the changes to the format, content and administration of the CPA exam. There is a need for additional research concentrating on results from candidates who have taken the computerized-based test. Success on the Uniform CPA exam remains a crucial step in pursuing a career as a certified public accountant. It is considered a prestigious accomplishment for candidates to pass all four parts of the exam with high scores. Colleges and universities also are recognized for the success rate of their graduates. Passing the CPA exam opens the door for more opportunities and advancement within the accounting profession.

Oliver Zhang conducted a study for the AICPA which summarized the test-taking and pass-fail patterns for all windows since the inception of the computerized-based exam in 2004 until the end of 2007. This study showed that the majority of candidates (approximately 67%) take only one section of the exam during each window (Zhang, 2008). The passing rate, which includes both first-time and repeat candidates for that group is approximately 47%. The pass rate drops dramatically for candidates who take more than one section at a time. Those who take two sections (27% of total candidates) have an approximate pass rate for both sections of 32%. Candidates taking three sections (3.84%) have an approximate pass rate of 21%, and those candidates who chose to take all four sections (1.97%) during one window have an approximate pass rate of 21% (Zhang, 2008). Approximately 20% of candidates eventually drop out of the process of taking the CPA exam due to the failure to pass all four parts or for other personal reasons (Zhang, 2008).
Considerable data are available for first-time candidate’s pass rates on the CPA exam. For example, annual reports published by NASBA compile data in an aggregate format. These reports list first-time and repeat pass rates by institution, region, number of credit hours, and type of degree. Asbaugh and Thompson (1993) looked at specific student demographic data and GPAs. As a follow-up, Brahmasrene and Whitten (2001) conducted research using exam candidates from Indiana, which confirmed that GPA was a significant factor in influencing the success on the CPA exam. Other significant variables included participation in a CPA review course and accounting work experience. Barilla and Jackson (2008) compared CPA exam candidates from Association to Advance Collegiate Schools of Business (AACSB) schools with candidates from non-AACSB institutions to determine if there was a significant difference in the scores on the CPA exam. In his Ph.D. dissertation, Russo (2002) gathered data on candidates in Pennsylvania taking the CPA exam for the first time. He compared candidates’ pass rates (dependent variable) with the following independent variables: GPA, number of credit hours, hours studied, and participation in an exam review course. Grant, Ciccotello, & Dickie (2002) found that the candidates with higher potential, as measured by college entrance exam scores, positively affected CPA exam scores. Other researchers have controlled for college entrance exam scores in their research to determine the effect of the 150 hours requirement on CPA exam pass rates (e.g. Boone, Legoria, Seifert, & Stammerjohan, 2006; Raghunandan, Read, & Brown, 2003). However, research is lacking in the area of the impact of involvement variables in higher education on the success of candidates on the CPA exam.
Information from this study will be relevant for both educators and professionals. Educators are looking for guidance in formulating policy for higher educational programs that will better prepare students to enter a complex financial and economic environment. The results of this study will provide additional information to improve the academic environment by emphasizing those variables present in colleges and universities that lead to higher levels of student success on performance on the CPA exam.

**Conceptual Framework**

In his Theory of Student Involvement, Alexander Astin has researched the ways in which college students become engaged in their educational process and how this influences various success measurements – such as retention, GPA, national exam scores, and degree completion. Many types of involvement have been studied to determine their influence on the student’s success and satisfaction with the educational experience.

This study will apply Astin’s student involvement theory to his input-environment-outcome (I-E-O) data analysis model as the conceptual framework. The I-E-O model studies the relationship between the inputs and the environment in order to evaluate their separate and joint influence on an outcome (Astin, 1993). In his use of the I-E-O Model, Astin explains that “outputs must always be evaluated in terms of inputs (Astin, 2001, p.17). For example, input variables such as ACT or SAT scores may affect the outcome performance measures. If these input variables are not controlled, the analysis of the effect of the college environment on the outcome performance measure (score on the FAR section of the CPA exam) may be biased. The goal of higher education is to “develop the talent of the students,” (Astin, 1993, p.17) by providing the best environment for learning. In the context of this study, inputs refer to the
demographic characteristics and entrance exam scores of the student population enrolled in the various universities throughout Ohio who sat for the FAR section of the CPA exam.

It is important to include environmental information on the educational institution in order to understand the interaction of the student and the educational process. It is necessary to understand what factors in the educational environment influence the success of a candidate for the FAR section of the CPA exam. Student demographic characteristics, alone, do not provide the whole picture.

Specifically, the environment includes the characteristics of the institution, the accounting program characteristics, the type of academic program (undergraduate/graduate), involvement variables and intermediate education outcomes. The involvement variables are divided into academic and peers. The outcome in various curricular and co-curricular activities measures the success of the student in terms of performance on the FAR section of the CPA exam. This study will use the score achieved on the FAR section of the Uniform CPA exam, a continuous variable, to measure success - the higher the score - the more successful, the candidate.
Assumptions

Candidates from the state of Ohio who have sat for the FAR section of the CPA exam provides the data to be used in evaluating the variables’ influence on performance on the FAR section of the CPA exam. Focusing on the FAR section yields similar results as if all four sections of the exam were being evaluated. Those variables found to influence success on the FAR section of the CPA exam will be useful in forming policy for accounting education.

Limitations

Data is provided by those individuals who chose to respond to the survey. Some candidates may have little personal interest or incentive to respond to the survey. Those who responded may not represent a broad spectrum of the population of candidates sitting for the FAR portion of the CPA exam.
All information is self-reported. The analysis of the data relies on the assumption that the responses are accurate. The surveys are anonymous, which may alleviate the problem of respondents inflating scores or GPA or otherwise responding inaccurately to questions.

Participants are limited to one state (Ohio). A national list of candidates who sat for the CPA exam is difficult to procure. Although, in most cases, NASBA has this information available, the information is not permitted to be released without authorization from individual state boards. Not all state boards are willing to share this information.

Scores are limited to the Financial Accounting and Reporting Standards (FAR) section. Although there are four parts of the exam, one section was chosen to study. Since the format of the CPA exam has been changed, candidates no longer sit for the entire exam at one sitting, and it would have been difficult to find an adequate sample of candidates who have recently sat for all four sections.

Although all subjects will have attained 150 hours of post-secondary education, the state of Ohio allows a certain amount of flexibility in fulfilling this requirement. Therefore, the population will include a mixture: subjects with undergraduate degrees and an additional 30 credit hours of undergraduate education, and subjects with graduate degrees, in fulfillment of the additional 30 credit hours.

It is not uncommon for college graduates to have attended multiple institutions of higher education. In this research, the subjects’ responses are limited to information on the most recent institution attended. For example, they are asked where their degree(s) were conferred, and information concerning their activities in their final year of college.
Regardless of these limitations, the data provided valuable information in exploring which variables in higher education influence the success on the Financial Accounting and Reporting Standards (FAR) section of the CPA exam. Limitations are discussed in more detail in Chapter 5.

Glossary

Association to Advance Collegiate Schools of Business (AACSB) - The AACSB is an organization of educational institutions and business committed to the improvement of business education. AACSB also serves as an accreditation agency.

Accounting Education Change Commission (AECC) – A five-year commitment and funding of $4 million was made available to study the changes needed in accounting education. In order to carry out this task, the AECC held conferences and awarded grants to individuals or institutions to address accounting education issues (Sundem, 1999).

American Institute of Certified Public Accountants (AICPA) – The AICPA is the national organization for certified public accountants. This organization provides leadership and guidance on interpretation of the financial accounting standards


Computer-based Test (CBT) – The computerized format of the Uniform CPA exam uses state-of-the-art technology in administering the exam. One of the benefits to the exam is the ability to update the content on a continuous basis (Holder & Thomas, 2005).
Cooperative Institutional Research Program (CIRP) – Research institution founded by Alexander Astin to study institutions of higher education and their affect on student development.

Master of Science in Accountancy (MSA) – A graduate degree specializing in the technical area of accounting.

Masters in Business Administration MBA – A general business graduate degree

National Association of State Boards of Accountancy (NASBA) – NASBA is entrusted with the administration of the uniform CPA examination. All applications and approvals go through NASBA with the cooperation of the individual state accountancy boards.

Sponsors' Education Task Force – A representative from each of the Big 8 firms was assigned to the Sponsors’ Education Task Force. Their purpose was to address the problem that accounting graduates were not prepared for the challenges facing them in the accounting profession. This group is responsible for preparing the White Paper (Sundem, 1999).

Uniform Certified Public Accounting Examination (CPA Exam) – All states require candidates for certification in public accounting to pass the CPA exam (Brahmasrene & Whitten, 2001). The national CPA exam is a rigorous examination which tests candidates on their knowledge of auditing, business law, theory and practice (Asbaugh & Thompson, 1993).

White Paper – The White Paper, Perspectives on Education: Capabilities for Success in the Accounting Profession, was issued by the AECC defined the necessary skills and academic background for preparation for the certified public accounting
profession. The report also recommended that the accounting program should be revised and that the Big 8 companies and the AAA use their resources to address these accounting education issues (Sundem, 1999).

**Summary**

This dissertation conducted research to address the various institutional, program, and involvement variables present in Ohio universities and colleges that are significant in influencing performance on the FAR section of the CPA exam. This study examined the scores of Ohio candidates - both first-time and repeat - who took the FAR section of the Uniform CPA exam and studied the effect of select variables present in higher education on the success on the FAR section of the CPA exam.

This study applied Astin’s Theory of Student Involvement, which is based on the assumption that if students are involved with or committed to their education, they will achieve higher levels of success. The Input-Environment-Outcome (I-E-O) model served as the conceptual framework in order to study the relationship between the inputs and the environment and evaluate their possible influence on the dependent variable - performance on the FAR section of the CPA exam.
Chapter 2

Literature Review

This chapter presents a comprehensive review of the literature pertinent to this dissertation. The major topics in this literature focused on discovering what academic variables have a significant influence on the performance of the FAR section of the CPA exam.

The first topic is Astin’s involvement theory in higher education. This theory proposes that an environment encouraging students to become actively involved in their education will lead to success in terms of talent development. His Input-Environment-Output (I-E-O) model provided the conceptual framework for the national studies examined here that researched the effect of academic undergraduate variables on the development of cognitive skills.

The second topic is a discussion of the attempts to reform accounting education that outlines the issues facing educators in their endeavors to improve undergraduate education for accounting majors. The concerns of both professional and academic leaders led to the consideration of many possible changes, primarily, the proposal to increase the requirements from 120- to 150-credit hours for certification in public accounting.

Third, many research studies have been conducted to determine significant variables influencing performance on the CPA exam. Selected research studies, using the CPA exam as the dependent variable, are examined.
Background

Alexander Astin founded the Cooperative Institutional Research Program (CIRP). This institution has been instrumental in producing longitudinal studies on the impact of higher education on student development. Astin is particularly interested in an institution’s ability to develop the talent of the students. Developing talent refers to increasing the students’ “intellectual and scholarly development, and to making a positive difference in their lives” (Astin, 1985, p. 61).

Astin recognizes that talent is multi-dimensional and that the goals of the academic programs within the institutions of higher education are to develop more than one talent. Technical expertise, critical thinking, and communication skills are among the aptitudes students strive to develop during their post-secondary experience. Most institutions think of talent development as synonymous with the program’s educational goals. It is difficult to assess talent development because the process takes place over a period of time. ACT or SAT scores and high school GPAs serve as the initial assessment for students upon entry into a higher education institution. At the end of their undergraduate education, many students are further assessed by means of a graduate entrance exam or national professional test. Astin is interested in discovering what factors are significant in contributing positively to students’ talent development.

Description of Astin’s Involvement Theory

Policymakers want to know how to put together the best programs to facilitate learning or to develop the talent of students. Astin’s theory of student involvement can be expressed simply as “Students learn by becoming involved” (Astin, 1985, p. 133). This theory is useful in conducting research to guide educators and administrators in
providing a learning environment that is best for students. Astin’s view is that an
environment that encourages students to become actively involved in their education,
leads to better talent development.

Involvement takes place during the educational experience. There may be times
that a student is more or less involved in the educational process. Involvement concerns
a number of activities, both physical and intellectual. Involvement can be measured in
both quantitative and qualitative terms. For example, consider the number of times a
student meets outside of class with a faculty member, or how often a student participates
actively in a class discussion. Involvement also includes other activities outside the
classroom, such as tutoring other students, joining student organizations, or working on
campus. A student who demonstrates leadership roles contributes to his/her talent
development.

Astin’s theory is important because it has implications for teaching methods,
programs, and academic resources. The theory connects the inputs (demographic data
and entrance exam scores) and the environmental variables present in an institution of
higher education (academic programs, faculty, and institutional resources) to the outcome
(satisfaction, persistence, standardized test scores). The student’s interaction in the
environment provided by the college influences the student’s development of talent. The
focus is on the student’s involvement, not just on the resources available. It is not enough
to concentrate on teaching methodologies and university resources alone. The student’s
level of energy and engagement with the learning process are important factors in
successful talent development.
Research Application of the I-E-O Model

Astin uses his I-E-O (Input-Environment-Output) model to assess student development. The purpose of the assessment is to determine what environmental factors have an influence on students’ outcomes. The inputs, however, also influence the outcomes; therefore, their effects on the outcomes need to be controlled before the environmental factors are tested. The I-E-O model is unique as an assessment tool in that it encompasses a more complete study of the variables that influence student’s outcomes.

For example, Astin and his colleagues at CIRP have conducted a series of studies using the I-E-O model to assess the influence of the academic environment and student involvement on success. In particular, studies using performance on professional standardized tests such as the MCAT (Medical College Admission Test), LSAT (Law School Admission Test), and the NTE (National Teacher’s Examination) as the dependent variables have been researched to determine what independent variables have a significant influence on test results. These studies are relevant to this dissertation’s topic because the CPA exam also represents a national test that emphasizes an area of expertise.

Input data, including the SAT (Scholastic Aptitude Test) and ACT (American College Test) scores, were provided by the 1985 CIRP freshman questionnaire and from the national testing programs. A follow-up CIRP questionnaire was administered during the 1989-1990 academic year to a national sample of students who had completed the 1985 CIRP questionnaire as freshmen in 1985. This second questionnaire supplied information on the student’s involvement in the academic environment. The data from these two questionnaires were then applied to assess the influence of involvement.
variables on the performance on the following standardized tests. In each study, the score on the standardized test was used as the dependent variable.

**MCAT** - MCAT scores from 1,854 candidates were procured from the Association of American Medical Colleges. After controlling for the input data, the environmental variables found to have the strongest effect on performance on the MCAT was “intellectual self esteem” (Astin, 1995, p. 211).

**LSAT** - The LSAT has been proven to be a significant predictor of law school GPA (Detwiler, 2011). This test represents an important step for entrance into law schools. The ability to perform well the LSAT is an important element of student talent development. Data from the 1985 CIRP questionnaire was used to match the SAT scores of 5,954 students with LSAT scores provided by the Law School Admissions Council. The involvement variables which had a positive influence on performance on the LSAT were: intellectual self-esteem, hours spent socializing with other students, and enrollment in interdisciplinary courses. The only faculty characteristic found to have a significant positive influence was the research orientation of the faculty (Astin, 1993).

Detwiler’s research determined that in addition to the LSAT, academic involvement and intermediate outcomes equally explained the variance in cumulative law school GPA for third year law students (Detwiler, 2011).

**NTE** – Opp’s Ph.D. dissertation studied the influence of undergraduate college variables on performance on the NTE. The Educational Testing Service provided NTE scores for this study. The NTE scores on three of the subtests - General Knowledge (N = 2,836), Communication Skills (N = 2,654), and Professional knowledge (N= 2,477) - were matched with the 1985 CIRP Freshman questionnaire (Astin, 1993). The input
characteristics, SAT verbal and math scores were shown to have a significant influence on the NTE scores. Involvement and intermediate variables that had a significant positive influence on NTE test results were: GPA and intellectual self esteem. Two other involvement variables that were also significant indicators of success on the NTE were: hours studying, and enrollment in interdisciplinary courses (Opp, 1992).

While many educators in higher educational institutions are committed to excellence in teaching and research, Astin prefers to extend that base to include the talent development of the student. In the studies cited above, Astin’s emphasis on assessment relates to the “teaching-learning process” (Astin, 1993, p. 4). The purpose of assessment is to learn what variables have positive influence on student’s talent development in order to form a stronger educational process that will lead to higher academic development.

Reform of Accounting Education

In 1989, representatives of the Big 8 Accounting firms (Arthur Andersen & Co., Arthur Young, Ernst & Whinney, Deloitte, Haskins & Sells, Touche Ross, Price Waterhouse, Coopers & Lybrand, Peat Marwick Main & Co.) issued a White Paper requesting a dialogue on reforming accounting education. The problem addressed in the White Paper was the perception that accounting graduates were not adequately prepared with the skills needed to face the challenges of the accounting profession. Specifically, a stronger focus on the following aptitudes: communication, intellectual and interpersonal skills was recommended, along with the goal of “developing analytical and conceptual thinking” (Perspectives, 1989, p. 3). It was further recommended that the American Accounting Association (AAA) form a committee to be assigned the task of reforming the accounting academic program.
Accounting Education Change Commission (AECC). In response to that recommendation, the AAA formed the Accounting Education Change Commission (AECC) with the assistance of a grant of $4 million from the Big 8 accounting firms. In Gary Sundem’s (1999) history of the AECC, he tells us that the commission was to be a temporary organization, committed to the goal of bringing accounting education into the 21st century. The commission began their task in 1989 and continued until 1996. The 18 committee members were comprised mainly of faculty with representatives from the following professional organizations as advisers: the Financial Executive Institute (FEI), National Association of State Boards of Accountancy (NASBA), the Institute of Management Accountants (IMA), Association to Advance Collegiate Schools of Business (AACSB), and the American Institute of Certified Public Accountants (AICPA).

The AECC awarded the first five universities (Brigham Young University, Kansas State University, University of Massachusetts at Amherst, University of North Texas, and Rutgers University), grants of approximately $200,000 in 1989 and 1990 to study comprehensive changes to the accounting curriculum. Another five universities were given similar awards the following year (Sundem and Williams, 1992). These universities worked intensively on a variety of projects aimed at developing an accounting program in line with the directives of the White Paper (Sundem and Williams, 1992).

Implementation of 150-hour requirement. As early as 1969, the AICPA was recommending requiring additional education for the CPA in all states. The response to these initial efforts was not generally enthusiastic (Deppe, Hansen & Jenne, 1988). Since
that time, however, call for implementation of the 150-hour requirement for CPAs has gained momentum. Still, the adoption of the requirement was not unanimous, and controversy over the advantages of requiring the additional education continues.

For example, Deppe, Hansen and Jenne (1988) studied Utah’s history in the early legislation of the 150-hour requirement. They noted that in 1981 Utah was one of the earlier states to adopt the requirement of 30 hours of post-baccalaureate education for CPAs, and that the mandate was met with much resistance. Opponents maintained that the prior requirements had been satisfactory in producing competent CPAs. They were also concerned that the opportunity costs of the additional credit hours would steer graduates away from public accounting and into other areas of the profession. Hawaii and Florida were two of the earlier states to adopt the new requirement. Opponents, however, felt this was due to their being “resort states” (Deppe, et al., 1988, p. 54), and their intent was to erect barriers to entry in order to limit the number of practicing CPAs.

Members of the Utah Board of Regents and university administrators were particularly concerned with the strain on financial resources of both the institutions of higher education and the students. The four-year colleges were concerned that they would lose their accounting students if the fifth year was passed. This resistance decreased, however, as the Utah Board of Regents permitted them to assemble their own fifth year. The media also was concerned over the requests for additional funds to support new programs. While several newspapers and TV station agreed with the idea of additional education, their focus reported on the financial burden to students, parents, and taxpayers to maintain the restructured programs.
The threat to repeal the legislation requiring 150 hours prompted members of the Utah Association of Certified Public Accountants (UACPA) to formulate a compromise bill. The revised bill outlined two routes a candidate could choose to become a CPA. The five-year track requires the extra 30 hours of post-baccalaureate education before passing the CPA exam and one year of qualified work experience to obtain a Utah CPA license. The four-year track requires the Bachelor’s degree plus one year of qualifying experience before passing the CPA exam, and three additional years of experience in order to obtain the Utah CPA license. Deppe, along with two other colleagues, conducted a longitudinal study (covered below) to determine how the members of the two groups fared in their career goals.

Utah is just one example of the kinds of difficulties encountered in adopting the 150-hour requirement. By the late 1980s, the majority of the members of the AICPA voted to require phasing in the 150-hour requirement for CPA applicants (Shafer and Kunkel, 2001).

Shafer and Kunkel’s study (2001) investigated the various accounting programs that had been developed in response to the 150-hour requirement. They sought information on whether these new programs were meeting the original objectives outlined in the White Paper. They gathered data from the chairs of accounting departments of all AACSB schools in the United States and Canada. Accounting program chairs were sent a survey asking if they offered a fifth year for students seeking CPA certification. If the respondents answered positively, they were then further questioned about the specifics of the program: number of credit hours and courses required for both undergraduate and graduate programs. They were also asked if any
“recent changes” (Shafer and Kunkel, 2001, p. 79) had been made to their undergraduate and graduate accounting programs. They found that the majority of the accounting programs that offered the additional 30 hours of education met this requirement with either a master of science in accountancy (MSA) or an MBA with an accounting emphasis.

Shafer and Kunkel (2001) concluded that the original objective of the additional academic year – to broaden the education of accounting majors – was not being met and that the majority of schools responded to the requirement by providing an even more narrow and technical degree in preparation for the CPA exam.

Albrecht and Sack (2002) argue that in spite of the call for reform of accounting education and the recommendations that followed by the AECC, accounting education continues to be “delivered the same way today as it was 20 or 30 years ago” (Albrecht and Sack, p. 2). The AICPA, IMA, AAA, and the Big 5 (down from the original 8 due to mergers) professional firms joined together to sponsor an in-depth study on the continued lack of change in accounting education. Albrecht and Sack were particularly critical of the 150-hour requirement, arguing that the opportunity costs of the additional year of education required for the CPA were responsible for the decrease in accounting majors.

Research Studies on Variables Predicting Performance on the CPA

In addition to the various requirements of individual states, the common national requirement to achieve CPA status is to pass the Uniform CPA examination. This central step in the process of certification continues to present serious challenges to candidates. The following selected studies encompass a wide range of research methods and
populations. This summary provides a substantial foundation of research aimed at discovering what factors influence success on the CPA exam.

A benchmark study in 1982 by Zook and Bremser had extensive influence on researchers seeking characteristics that are significant in affecting performance on the CPA exam. Zook and Bremser surveyed 300 randomly selected candidates who sat for the CPA exam in Pennsylvania during 1978. They wanted to see how a variety of factors would influence performance on each of the individual parts of the CPA exam. Some of the variables used were: number of hours of study, SAT scores, participation in CPA review courses, number of accounting courses, GPA, professional experience, performance in math, computer science, and law courses. The authors tested the statistical significance of the relationship between the variables and the performance on the four individual parts (Auditing, Law, Theory, Practice) of the exam. They found that candidates, who had studied more than seven hours per week for ten weeks preceding the exam, attended a review course, achieved SAT scores of 500 or above, and had a GPA of 3.0 or above had more success in passing the different parts of the exam than those candidates without those characteristics. They also found that candidates who took more than four-credit hours of law had more success in passing the law section of the exam than candidates with less than four-credit hours of law. Candidates who were currently employed in a CPA firm had a higher rate of passing the Theory and Practice sections of the exams than those not employed in a CPA firm.

Variables that did not have a significant influence on passing the different parts of the CPA exam were: “possession of a graduate degree, length and type of past accounting-related employment, and number of credits earning in accounting, statistics,
computer sciences, statistics, and probability courses” (Zook & Bremser, 50). This is a significant study in that it is one of the earliest studies involving variables influencing success on the CPA exam. In addition, Zook and Bremser concentrated their study on first-time and repeat candidates and on passing rates on the individual sections of the exam, rather than an overall pass rate.

Asbaugh and Thompson (1993) expanded on Zook and Bremer’s 1982 study by using a more current sample of candidates. They surveyed 234 first-time candidates who sat for the CPA exam in Iowa during the 1989 and 1990 time period. The time-frame preceded the Iowa state legislature’s passage of a bill that phased in the 150-hour requirement over the following eight years (Asbaugh & Thompson).

Rather than focus on the different sections of the exam, Asbaugh and Thompson conducted a study to determine which variables are significant in influencing passing all parts of the CPA exam on the first attempt. Asbaugh and Thompson included the variables by Zook and Bremer (1982) had previously found to be significant as predictors of success on the CPA exam such as: undergraduate GPA and college entrance exam scores. In addition, they also included earned grades in CPA review courses and high school demographics (class size, ranking of high school). In order to identify those factors that may be statistically significant in predicting “superior CPA exam performance” (Asbaugh & Thompson, p. 3), they used “performance on the CPA Exam” (i.e. passing all four parts on the first attempt) which was dichotomized as “Pass” or “No pass” as the dependent variable (Asbaugh & Thompson, p. 3). They compared successful candidates who passed the CPA exam on the first attempt with non-successful
candidates - those who failed one or more parts of the exam on their first attempt. A stepwise regression was performed to determine which variables were significant.

Asbaugh and Thompson (1993) concluded that candidates who attended high schools that offered college preparatory classes, on the average, had higher rates of success than students coming from high schools that did not offer such courses. They also concluded that the three variables that were statistically significant in affecting success on the CPA exam were the independent variables: CPA review course grade, high school class rank, and high school class size. Asbaugh and Thompson recommended that further studies look at additional states over a period of time in order to further validate these findings.

Brahmasrene and Whitten (2001) expressed concern that passing rates for the CPA exam were well below those of the bar examination. They conducted research using CPA exam candidates from Indiana, which confirmed Zook and Bremser’s (1982) and Asbaugh and Thompson’s (1993) findings that GPA, participation in a CPA review course, and accounting work experience were significant factors in influencing the success on the CPA exam.

Brahmasrene and Whitten’s 2001 study used a logistic regression to “determine which factors will improve the likelihood of a candidate’s passing the Uniform CPA Examination” (Brahmasrene & Whitten, 2001, p. 49). They surveyed candidates from Indiana who sat for the CPA exam during May, 1998. The 150-hour requirement did not go into effect in Indiana until the May 2000 exam (Brahmasarene & Whitten). The results from their survey were compared with other studies with candidates from other regions of the country. The format of the exam had changed since Asbaugh and
Thompson’s study. The exam now took place over a two-day time period, rather than two and one-half days, and writing skills were added to three parts of the exam (Barilla & Jackson, 2008). Brahmasrene and Whitten studied responses from first-time and repeat candidates for the CPA exam. They received 231 completed surveys, a 26% response rate. The continuous independent variables used were: GPA, credit hours, high school GPA, high school class size, and age. Other independent variables included: experience, type of preparation, gender and race. The dependent variable was the outcome on the CPA exam. They used a dichotomous dependent variable to determine those candidates considered (1) successful or (2) unsuccessful. Brahmasrene and Whitten’s definition of success included candidates who had passed all four parts of the CPA exam in one sitting with a minimum score of 75, and also those candidates who had achieved conditional status, i.e. passed a minimum of two parts with 75 and the remaining part(s) with a minimum of 50. Their findings indicated that undergraduate GPA, age, gender and experience were significant in predicting success on the CPA exam. Brahmasarene and Whitten noted that older candidates had higher success rates than younger candidates. They speculated that the higher success rate is attributable to maturity, experience and study habits.

Deppe, Smith and Stice (1992) performed a 10-year longitudinal study of graduates of the accounting program at Brigham Young University. Their purpose was to examine specific variables in order to determine the differences between students with a baccalaureate degree and those with a graduate degree. They used the alumni records from 1979 to 1988 of graduates of the School of Accountancy and Information Systems. Questionnaires were sent to 1,700 students with bachelor degrees and 721 students with
master of science in accountancy. Response rate from the students with graduate degrees was 34.2% as compared with 28% from graduates with undergraduate degrees only. The researchers attributed the higher response rate from alumni with graduate degrees to a number of reasons. For one, it is possible that graduates with master’s degrees experienced greater success in their career, and therefore would be more willing to share the information. This would also suggest that respondents with graduate degrees may “reflect a positive response bias” (Deppe, et al., p. 20). Deppe, et al., also noted that, in general, graduate programs tend to have smaller class sizes and that students tend to interact more frequently with their professors. These characteristics suggest that graduate students have a high level of involvement with their education.

The study focused on the following variables: salaries, years to pass the CPA exam and turnover rate with first employer. Deppe, et al. found that beginning salaries were higher for master’s graduates in public accounting as well as in private industry. They suggest that the differential may be due to master’s graduates’ stronger “perceptual, analytical and communication skills” (Deppe, et al., p. 21) and that, because of the additional education, these new employees would require less supervision. This differential in salaries, however, decreased or even disappeared after some years of experience had been earned.

At an average, it took candidates with graduate degrees one year less to pass the CPA exam than those candidates holding only a bachelor’s degree. These findings may indicate that the curriculum in the masters in accountancy prepared students with the technical expertise needed to challenge the problems addressed in the CPA examination.
There is also the possibility that students enrolled in graduate programs are academically stronger than the average undergraduate student.

The researchers found that there was no significant difference in promotion or advancement between master’s graduates and baccalaureate graduates. The hypothesis was that turnover rate would be lower for graduates with a master’s degree because of the higher level of technical ability and their ability to address complex issues. The data showed that during the first three years, turnover rate was higher for baccalaureate graduates than for master’s graduates. This turnover rate, though, could be attributed to a number of factors. For example, the age, maturity and marital status might influence the desire to remain with the same company. When turnover did occur, both groups selected similar reasons: higher salary and greater chance for advancement. The third reason given differed between the two groups – graduates with master’s degrees more often chose a better working environment as compared with the graduates with a B. A. only.

The major differences between the two groups were beginning salaries and years to pass the CPA exam. This study involved only graduates from Brigham Young University. The authors suggest that the dialogue continue between educators and practitioners regarding the direction of accounting education

Wier, Stone and Hunton (2005) conducted a study on the value-added factor of graduate education in relation to managerial accounting careers. They expanded on the 1992 study by Deppe, Smith and Stice that focused on accounting graduates in Utah who were preparing for the CPA exam. The researchers addressed the skepticism concerning the benefit of the cost of a graduate degree to success in an accounting career. Wier, et al. studied the value of graduate degrees - specifically MBAs and MSAs - by using “three
theoretical models: selection, learned knowledge, and life-long learning” (Wier, et al., p. 86). The selection theory is based on the assumption that students with higher academic ability (higher GPA) will pursue a graduate degree. Therefore, the hypothesis suggests that any success is due more to the intelligence or problem-solving abilities of the individual, rather than the degree itself. The learned knowledge theory looks at graduates from MSA and MBA programs. In comparing these graduates, it is first anticipated that MSA graduates will exhibit a higher level of technical expertise than graduates with MBA degrees or undergraduate degrees only. This is due to the highly intensive technical focus of the MSA. The MBA, also a highly technical degree, has a more general business focus which emphasizes analytical thinking. It is further anticipated that graduates with MBAs would have a higher technical jobs performance than those with undergraduate degrees only. The life-long learning theory asserts that the process of further post-baccalaureate education benefits the graduate by developing “tacit skills, such as leadership, goal setting, self-improvement, and relationship building” (Weir, et al., p 89). Therefore, the theory posits that individuals with graduate degrees are expected to exhibit a higher level of the skills needed in a management environment.

The researchers surveyed members of the MAIA (Managerial Accountants Industry Association) in both the United States and Canada. Their variables included demographic information, job performance evaluations (JPE), tacit managerial knowledge (TMK) and problem solving ability (PSA). They found that although both the MSA and MBA degree had a significant positive influence on JPEs, holders of the MSA degree had an advantage in the early years of their career over holders of the MBA or undergraduate degrees. In addition, those subjects with MSA degrees scored higher on
technical JPEs and analytical JPEs. Performance on tacit skills JPEs, were tied to years of experience and graduate degree. Overall, the data support the learned knowledge and life-long learning theories and reject the selection theory. The researchers concluded that there is value to a graduate degree with the MSA having a greater positive influence in the early career years of managerial accountants as compared with the MBA degree.

In their research, Grant, Ciccotello and Dickie (2002) addressed one of the issues surrounding the debate concerning the policy implications of requiring 150 hours to sit for the CPA exam. They questioned whether the incremental expense of an additional 30 credit hours is an efficient approach in increasing pass rates on the CPA exam. They conducted a longitudinal study using national data from 1996-1998 to study the relationship between the 150-hour requirement and performance on the CPA exam. At the time of their research, Iowa, Michigan, Minnesota and North Carolina had recently passed legislation allowing candidates to sit for the CPA exam before completing 150 hours. The following inputs provided by NASBA’s database were: number of sections passed, SAT/ACT math and verbal scores, number of college credit hours, number of accounting credit hours, graduate vs. undergraduate degree, community college credit hours, institution, CPA review course participation. Using Pearson correlation coefficients to check for multicollinearity, Grant, et. al determined that multicollinearity was not a significant issue affecting the findings of the study.

The researchers concluded that the 150-hour requirement was not an efficient input for contributing to success on the CPA exam. They found that student aptitude, as measured by SAT or ACT scores was the strongest predictor for success on the CPA exam. They also found that since participation in a CPA exam review course was a
strong factor in contributing to success on the CPA exam, this would constitute a more economical means of preparing for the exam than the additional 30 academic credit hours.

Motivated to confront the criticism of the 150-hour requirement, Raghunandan, Read and Brown (2003) conducted research to measure possible benefits of the 150-hour requirement. They used national data collected by NASBA for first-time candidates who sat for the exam during 1996-1998 (same database as Grant, et. al, 2002) to address the question whether first-time candidates with 150 semester hours perform significantly better on the CPA candidate without 150 semesters. After controlling for SAT scores, enrollment in a CPA review course and accounting credit hours, first-time candidates with at least 150 semester hours were found to have a higher passing rate on all four parts of the CPA exam than those with less than 150 hours. Contrary to the findings of Grant, et. al (2002), Raghunandan, et. al found that the 150-hour requirement is beneficial to both students and CPA firms. One of the advantages of requiring 150 hours would be higher success on the CPA exam. Their paper did not address the cost/benefit issue of the 150-hour requirement.

In his Ph.D. dissertation, Russo (2002) gathered data on candidates in Pennsylvania taking the CPA exam for the first time. Pennsylvania does not require 150 hours to sit for the CPA exam. He compared candidates’ pass rates (dependent variable) with the following independent variables: GPA, number of credit hours, hours studied, and participation in an exam review course.

Russo studied the “relationship between selected academic variables and success of first-time candidates on the Uniform CPA Exam” (Russo, 2002, p. 93). Russo sent
surveys to all first-time candidates who sat for the CPA exam in Pennsylvania in November, 2000. The five dependent variables used to measure success were the scores on the four parts of the exam (Auditing, Law and Professional Studies, Financial Accounting and Reporting and Accounting and Reporting), and the number of parts passed on the first attempt. The independent variables included: credit hours of higher education; credit hours in specific accounting courses; overall GPA, accounting GPA, highest degree held, participation in a CPA review course and hours studied for the CPA exam.

Russo used a range of simple regressions to test the hypotheses that there was no relationship between the scores on each of the four parts and the independent variables. Multiple regression analyses were used to test if a predictive relationship existed between the scores of each of the four parts of the exam and one-way Anovas were run to look at the effect of taking a review course on the success of the CPA exam. The results of the Pennsylvania study were compared with some of the statistics supplied by NASBA. Key limitations to the study concerned the self-reported scores to the survey. Respondents tended to have higher pass rates than the entire population of first-time candidates taking the CPA exam. This is attributed to successful candidates being more likely to answer the survey. Since the 150-hour requirement was not yet in place in Pennsylvania at the time of the study, there were few candidates with advanced degrees. There were only 13 respondents out of 165 who held an advanced degree.

Russo concluded that the major factors that contributed to success in the CPA exam were: GPA, hours of study, CPA review course, and the appropriate academic background in accounting. He recommended that future research could concentrate on
which study methods contribute to higher success rate, along with a comparison of “classroom-based review courses, review software, CPA review guides, or other study methods” (Russo, p. 244). He also suggested that repeat candidates be studied to determine what methods contributed to their eventual success.

Both professionals and educators were concerned that a decrease in the number of CPA exam candidates occurred following the implementation of the 150-hour requirement. Allen and Woodland (2006) conducted a longitudinal study on candidates who sat for the CPA exam from 1991-2002, using data provided by NASBA. They studied the effect of the 150-hour requirement on the number of candidates taking the exam, and on the pass rate (i.e., passing all parts of the exam on the first attempt). They found states that had passed the 150-hour requirement experienced a decrease in the number of candidates sitting for the exam. Those states permitting candidates to be grandfathered under the old rules, experienced a 13% increase in candidates the year prior to implementing the requirement and a 3.5% decrease in overall pass rate. This decrease may be attributed to a number of unprepared candidates sitting for the exam with the sole purpose of being grandfathered in. The following year, a substantial decrease in CPA exam candidates occurred in those states.

During 1991-2002, a number of jurisdictions were in the process of considering the 150-hour requirement. Allen and Woodland included all candidates in their study. The candidate pool was a mixture of first-time and repeat candidates, some of whom had completed 150 hours. This mixture of types of candidates was a factor in increasing the biases and weakening the test results. An additional test using only first-time candidates produced a 3% increase in pass rates following the 150-hour requirement.
Based on their findings, Woodland and Allen (2006) concluded that the 150-hour requirement is related to the decrease in exam candidates. They did not find any significant effect of the 150-hour requirement on the pass rates. They noted that a number of unprepared candidates sat for the exam to avoid the 150-hour requirement. Since the implementation of the 150-hour requirement, the number of CPA exam candidates has declined.

Following Allen and Woodland’s study, Boone, Legoria, Seifert and Stammerjohan (2006) felt there was a need to exam more closely the relationship between accounting program attributes and the 150-hour requirement on the CPA exam. In this study, 43,711 candidates from 520 institutions of higher education sat for the CPA exam during 1998 and 1999. Their source of data for these findings came from the 1999 and 2000 editions of the Candidate Performance on the CPA Exam, published by NASBA. They noted that previous research by Colbert and Murray established that student aptitude inputs measured by ACT/SAT scores was a major factor in predicting success on the CPA exam. Therefore, they chose the ACT score as an indicator of student aptitude.

Boone, et. al found that although pass rates for the CPA exam declined during the transition period, pass rates increased in those jurisdictions where the 150-hour requirement was in place.

Allen and Woodland found no significant difference between the pass rates with candidates with 120 hours as compared with candidates with 150 hours. Boone, et al. (2006) noted that an initial decline in pass rates did occur during the transition period of adopting the 150 hours, which may explain Allen and Woodland’s findings. However,
after that initial decline, pass rates did then increase for candidates from states that had adopted the 150 hours. The combination of ACT scores and a graduate degree are significant predictors for success on the CPA exam. The relationship between AACSB schools and pass rates on the CPA exam could be attributed to one element of the institutions’ policies, that is – student selectivity. In addition, faculty research production had no significant effect on candidates who passed some parts of the exam, but was significantly related to first-time candidates who passed all four parts of the exam.

Boone, et al. recommends that further research using the computer-based test and “candidate-specific information” (214) would benefit future research on improving accounting programs.

Barilla and Jackson (2008) conducted a study comparing candidates from institutions accredited by the American Assembly of Collegiate Schools of Business (AACSB) and candidates from non-AACSB accredited institutions. This study was significant because the format of the CPA exam and the requirements for sitting for the exam had changed dramatically during the time frame studied – 1986-2004 - since a previous study by Marts, Baker and Garris (1988) had been conducted. Barilla’s and Jackson’s study used data from the annual editions of the CPA Candidate Performance on the Uniform CPA Examination from 1986-2004, published by NASBA. The exam was re-formatted in 1993 and was then administered twice during the year over a two-day period and contained four parts: Accounting and Reporting-ARE; Auditing-AUDIT; Business Law and Professional Responsibilities (LPR) and Financial Accounting and Reporting (FARE). This revision of the exam also contained an additional writing skills
section on three parts of the exam counting for 5% of the score (Barilla and Jackson, 2008). By the end of the 1990’s, most states were requiring 150 hours to sit for the exam.

The researchers used a “logit estimation technique” (Barilla, & Jackson, 2008, p. 271) and determined that candidates from AACSB schools, who sat for the CPA exam for the first time had a higher passing rate than students from other accrediting agencies. However, the authors noted that accreditation alone was not enough to “increase the odds of success of first-time candidates” (Barilla & Jackson, p. 273) as schools accredited by Association of Collegiate Business Schools and Programs (ACBSP) also contributed “to increased exam success rates. . .” (Barilla, & Jackson, p. 273).

Summary

This chapter has been a literature review of the major topics supporting the research for this dissertation: Astin’s involvement theory, attempt at reforming accounting education, and coverage of a number of research studies analyzing various factors influencing success on the CPA exam.

In his theory of student involvement, Astin proposes that an academic environment that encourages student’s involvement in the learning process will result in greater success by the student. One way that success can be measured is performance on a national standardized test. Astin applied the I-E-O conceptual framework model to research that tested his involvement theory. using standardized tests such as the MCAT, LSAT and NTE as the dependent variables. An analysis of the results of these studies determined that one common variable - intellectual self-esteem - positively influenced the test results.
In response to the recommendations put forth by the White Paper, university and college educators collaborated to reform accounting education. These reforms centered on helping students develop communication and analytical and critical thinking skills. The AICPA’s proposal to require 150 hours to acquire certification in public accounting, also drove many of the sweeping changes that have been made to accounting education.

Several studies that used the CPA exam pass rates as the dependent variable have been important in contributing to the understanding of what independent variables contribute to success on the CPA exam. A composite of these studies has shown that the following independent variables have significant influence on successful performance on the CPA exam: 150-hour requirement, CPA exam review course, and college GPA. Understanding which variables contribute to the success of the exam is important to educators and administrators.

Research, however, is still lacking in the area of the influence of involvement variables in higher education on the success of candidates on the CPA exam. In addition to the variables already known to contribute to success on the CPA exam, additional variables measuring involvement will be tested in this study on Ohio candidates who have taken the FAR section of the CPA exam.
Chapter 3

Methodology

This chapter describes the research methodology for this study that includes: the data analysis framework, procedures, description of the instrument used, and the participants involved. This study analyzes the relationship between selected student characteristics and higher education variables, and success on the Financial Accounting and Reporting Standards (FAR) section of the CPA examination in Ohio. Success is defined by the candidate’s score on the FAR section of the CPA exam, with higher scores denoting more success than lower scores. A survey was used to collect data from Ohio candidates who sat for the FAR section of the CPA exam during 2009 and 2010. A review of empirical research from the literature supporting the survey questions and the quantitative method used is provided.

General Survey Design Framework

This research measured and identified those variables that have an influence on success on the FAR section of the CPA exam. Astin’s I-E-O model provided both the conceptual and data analysis framework for this study.

Astin’s I-E-O Model. Alexander Astin has used his input-environment-outcome (I-E-O) model for more than four decades to study the impact of college on undergraduate student development. Throughout their college careers, students have been exposed to many environmental variables. The aim of the I-E-O model is to measure how students have grown and what environmental variables are most effective in achieving this growth. This knowledge is beneficial to educators and policy makers because it provides a foundation to improve teaching and academic programs. This
model’s objective is to guide the researcher in focusing on the how the environmental variables affect the outcome measure (Astin, 1993). The I-E-O model assists the researcher to visualize the process of evaluation. Specifically, in this dissertation, the I-E-O model was used to assess what environmental variables influence the score on the FAR section of the CPA exam.

The data analysis framework (Figure 2) for this research applied Astin’s model of input-environment-outcome (I-E-O). The model concentrated on three main elements. First, the inputs refer to student characteristics at the time of their entry into college. Secondly, the environment includes the student’s interactions with the various components of the higher educational environment such as programs, faculty, and peers. Third, the outcome measures the student’s change or growth in an area related to the student’s college experience. Astin notes that the outcomes are influenced by students’ input characteristics. In order to focus on the effects of the environmental variables on the student’s outcome, the influence of the input variables are controlled.

The independent variables are the input and the environmental variables. The I-E-O model format organizes the independent variables into blocks. These blocks are then sequentially entered into the stepwise multiple regression. The input variables (Blocks 1 and 2) are entered first in order to control their effect on the outcome. The input variables include demographic data and college entrance exam scores. The environmental variables (Blocks 4-7) are entered next into the regression formula. The environmental blocks include the “between-institution measures” (Astin, 2002, p. 86), composed of characteristics such as size and type, and the “within-institution measures” (Astin, p. 91), composed of between college characteristics and involvement variables.
The outcome or dependent variable measures the cognitive development of the student by using the score on the Financial Accounting and Reporting Standards (FAR) section of the CPA exam. A significance level of .05 will be used.

Procedure

A quantitative method applying a stepwise multiple regression analysis was used to obtain a predictive model for success on the FAR section of the CPA exam. Multiple regression analysis allows the researcher to use several variables to predict an outcome (Moore & McCabe, 2006). By using a stepwise multiple regression, the researcher is able to control the variables by entering them in a sequential process. The I-E-O framework in Figure 2 illustrates the student’s interaction with the institutional environment over a period of time.

Opp’s (2002) research on improving retention rates among students of color in two-year academic programs used the I-E-O model and a blocked form of stepwise regression. The variables were divided into five blocks. In Opp’s analysis, the inputs (student characteristics) were entered first, followed by the institutional characteristics. This allowed him to statistically control for the biases present in those variables. Rocks’ (2004) dissertation studied the influence of environmental and involvement variables on student athletic candidates’ performance on the National Athletic Trainer’s Association Board of Certification Examination (NATABOC). She used Astin’s I-E-O model to organize the environmental variables into blocks before entering them sequentially in a stepwise regression. Her research indicated which variables were significant in predicting success on the standardized national exam for athletic trainers.
Figure 2. Data Framework: I-E-O Model
A similar quantitative method was used by Asbaugh and Thompson (1993) in their research to determine which factors contribute to exceptional performance on the CPA exam. They entered their independent variables into a stepwise regression to compare candidates who passed all parts of the exam with those who did not. Russo’s (2002) dissertation, studying selected variables influencing performance on the CPA examination in Pennsylvania, used a stepwise multiple regression and a hierarchical regression analysis to control for those variables already known to have a significant influence on success on the CPA exam.

**Description of Blocks 1-7**

Block 1: Pre-test and Block 2: Student Characteristics are the input variables that are entered first into the stepwise regression. These two blocks are entered first because the student’s initial exposure to the institutional environment is limited. The activity of entering these blocks first recognizes that the student input variables are assessed prior to any substantial interaction with the environment and that the institutional characteristics “occur prior to other environmental variables, such as student involvement” (Astin, 1993, p. 80). This procedure statistically controls the influence of these variables on the dependent variable – the score on the FAR section of the CPA exam.

The input variables are located in Blocks 1 and 2. Block 1 contains the ACT scores, and Block 2 includes the demographic characteristics (age, gender, and race). Previous studies have found that ACT scores used as an indication of student ability are a significant predictor of success on the CPA exam (Zook and Bremser, 1982, Asbaugh & Thompson, 1993, Grant, et al., 2002, Raghunandan, et al., 2003). Using the combined
ACT gives the same results as studies that break down the ACT into Math and English scores (Asbaugh & Thompson, 1993).

Block 3: Institutional Characteristics, the first environmental block, contains between-institution characteristics to obtain an understanding of the type of undergraduate/graduate institution where the participant received his/her most recent degree. These characteristics include the Carnegie classifications of size and selectivity index. Candidates from institutions with higher selectivity tend to have higher pass rates than do those candidates from institutions with lower selectivity (Boone, et al., 2006, Grant, et al. 2001). Based on previous research, this dissertation expected to find a positive relationship between ACT scores and institutions with higher selectivity on scores on the FAR section of the CPA exam.

Next, environmental blocks 4-7 are entered sequentially into the regression model. Block 4: Type of Degree and Program, gathers information on whether or not the candidates completed a graduate degree and/or completed a CPA exam review course. The majority of candidates sitting for the CPA exam in Ohio must have completed 150 hours of higher education. Two options for this requirement are available. Candidates may choose to complete the extra 30 credit hours with an additional year at the undergraduate level, or they may choose to complete the fifth year with a graduate degree. Studies by Deppe, Smith and Stice (1992) and Weir, Stone and Hunton (2005) examined the effect of graduate business degrees on success in the accounting profession and on pass rates on the CPA exam. In their study, Deppe, et. al indicated that candidates benefited from the additional education from a graduate degree by having higher pass rates on the CPA exam than did those candidates without a graduate degree. Weir, et al.
further examined whether a technical degree such as the Master of Science in
Accountancy (MSA) is more beneficial than the somewhat general master in business
administration (MBA). Weir, et al. found, in agreement with Deppe, et al., that pass rates
were higher for candidates with graduate degrees as opposed to candidates without
graduate degrees. Weir, et al., also found that candidates with a MSA degree experienced
higher pass rates on the CPA exam than did candidates with MBAs. Other studies
compared pass rates between candidates with 150 hours and those with less than 150
hours. For example, Raghunandan, Read, and Brown (2003) conducted a national
longitudinal study using data provided by NASBA on candidates who sat for the CPA
exam from 1996-1998. They found that one of the benefits of the 150-hour requirement
was a higher pass rate on the CPA exam. However, a similar study by Allen and
Woodland (2006) using NASBA’s data from 1991-2002 did not find any significant
differences in pass rates between candidates with 150 hours and those without.

The candidates in this study will have completed 150 hours of higher education in
accordance with the rules set by the Ohio State Board of Accountancy. Therefore, this
research will include candidates with graduate degrees and those with 150 hours of
undergraduate education. It is expected that the graduate degrees will be a mixture of
mainly MSA and MBA degrees. This research anticipates that the type of graduate degree
will be a significant factor in predicting success on the FAR section of the CPA exam.

Block 5: Involvement Factors (Academic) concern employment of the candidate,
number of study hours, and interaction with faculty and class assignments. The
involvement factors have had a significant effect on the intermediate education outcomes
in Block 7. In his earlier longitudinal study, Astin (1985) noted that students who
interact with faculty tend to have higher self-esteem ratings. Astin repeated this research more than ten years later with similar findings. Other academic involvement variables found to positively affect intellectual self-esteem and GPA were participation in class presentations and research projects (Astin, 1993).

Block 6: Involvement Factors (Peers), gathers information on the time candidates spent with peers and any leadership roles. The variables measure time spent studying with peers, tutoring peers, and participating in student organizations. The peer group environment has been shown to be a crucial factor in student behavior – even more so than the “generic college experience” (Astin, 1993, p. 90). In particular, tutoring other students positively affects intellectual self-esteem, scores on standardized tests and achievement of degree objectives. The positive effect on standardized tests, in part, may be attributed to the innate abilities of the students who tutor. These students tend to have higher self-esteem and higher technical skills. They are comfortable with the tutoring process and the enhanced interaction with their peers (Astin, 1993).

Student involvement factors have been evaluated for success by using a variety of standardized test scores such as: LCAT, MCAT, GRE and NTE (Astin, 1993) to assess cognitive development. Intellectual self-esteem and involvement with peers strongly predicted success on the MCAT (Astin, 1993). However, these variables have not yet been used specifically to test accounting students’ success. This study attempts to tie academic involvement factors to success on the FAR section of the CPA exam. Based on these previous studies, this study expects to find a positive relationship between student involvement factors and success on the FAR section of the CPA exam.
Block 7: Intermediate Education Outcomes contains a series of questions measuring intellectual self-esteem, undergraduate and graduate GPA, and highest level of education. Several studies have shown that GPA (Zook & Bremser, 1982, Asbaugh & Thompson, 1993) is a significant factor in predicting performance on the CPA exam. Asbaugh and Thompson found that it is unnecessary to include both overall GPA and accounting GPA, as this resulted in gathering redundant information.

As noted earlier, a positive correlation exists between student interaction with faculty and peers and a higher level of “intellectual self-confidence” (Astin, 1993, p. 114). One explanation for this may be that students with high self-esteem surround themselves with similar students. This, in turn, contributes to an intense academic environment. Such students are committed to success in their education and devote more time to their studies and career development (Astin, 1993). Students facing the challenge of preparing for the CPA exam may associate with other students with the same goal. The involvement with one’s peers may promote a competitive academic environment and serve to motivate the students to take the preparation seriously.

Astin addresses the question of why intellectual self-esteem and peer group involvement have a positive effect on standardized tests. He points to three possible reasons:

1. Associating with other highly motivated people nurtures a competitive academic environment in which the students challenge themselves and one another;

2. Sharing of intellectual ideas leads to the students to help one another with problem solving;
3. Student sharing a common goal – in this case, passing the CPA exam – could learn “tricks of the trade” (Astin, 1993, p. 211) from one another on how to achieve this goal (Astin, 1993).

**Multicollinearity Issues.** It is a common practice for researchers to check for multicollinearity when variables are highly correlated. Astin (1993) points out that when running the stepwise multiple regressions, the betas “for all the variables tend to get smaller at each successive stage. . .” (p. 287). This shrinkage in the beta weights indicates that multicollinearity exists. Therefore, caution is recommended before making any conclusions about the significance of the variables because of the effect of the close correlations these variables have to one another. It is important to watch the change in the values of the betas as more variables are added to the equation that could indicate that the variables are closely correlated. Three factors should be considered: “the variable’s simple correlation with the dependent variable, the size of the beta at the point the variable enters the regression, and the other entering variables that cause the biggest drops in that variable’s beta” (Astin, p. 298). In their study on the effectiveness of the 150-hour requirement, Grant, Ciccotello & Dickie (2002) tested their data for multicollinearity and found that it was not a major issue in affecting the results of their study.

**Instrument**

A Vovici web-based original survey (Appendix A) was sent to Ohio candidates who sat for the Financial Accounting and Reporting Standards (FAR) section of the CPA exam in 2009 and the first half of 2010. The survey served as the information-gathering step in the study. The decision to use a web-based survey was made after permission to
obtain e-mail addresses was granted by the Ohio State Board of Accountancy. The Vovici web-based survey compiles the data upon receipt into a SPSS statistical software program, thereby providing both accuracy in the recording of the data and privacy of the respondent. Research has found that that response rates to web surveys is lower than that for paper surveys (Converse, P. D., et al., 2008), and it did become necessary to purchase an additional e-mail listing of candidates in order to gather a sufficient number of usable responses.

**Database for Participants’ Addresses.** Each state has a State Board of Accountancy which governs the release of information pertaining to this exam. Richard Joseph, Assistant Director, Ohio State Board of Accountancy, granted permission to purchase names and addresses of candidates who sat for the CPA exam in Ohio. The actual databases containing mailing lists of candidates on a state-by-state basis is located at NASBA headquarters in Nashville, Tennessee. NASBA serves 55 boards of accountancy which includes all 50 states, the Commonwealth of the Northern Mariana Islands, District of Columbia, Guam, Puerto Rico, and the Virgin Islands. They are the center of the data collection for all personal information and test results of candidates who take the CPA exam. A mailing list of Ohio candidates will be purchased from NASBA. In addition to gathering names and addresses of those candidates, NASBA also collects and publishes data on the results of the CPA exam. The data available from NASBA is an aggregate compilation of the participants and the results of the CPA exam. This analysis divides the pass rate information into national, jurisdiction, and institutional segments. Candidate groups are described as: first-time candidates, repeat candidates,
and total candidates. In addition, pass rates on the individual sections of the exam are also listed.

**Survey Design and Participants.** NASBA’s data provided helpful insight into performance on the CPA exam in obtaining an overview of the CPA exam results. However, an original survey has been designed for this study because of the specific variables that are not addressed in the data provided by NASBA. In particular, involvement variables and questions concerning intellectual self esteem are unique to this study concerning success on the FAR section of the CPA exam.

The survey asked the candidates, who sat for the FAR section of the CPA exam during 2009 and the first half of 2010, questions on demographics, institutional characteristics, program variables, involvement factors, and their individual scores on the FAR section of the CPA exam. They were also asked what type of degree (graduate/undergraduate) and program (MSA, MBA, other) they completed. All candidates sitting for the CPA exam in Ohio are required by the Ohio State Board of Accountancy to have completed 150 hours of post-secondary education. Since this requirement can be fulfilled with either undergraduate or graduate credit hours, there was a mixture of type of degrees among the subjects.

The survey was validated by means of a pilot test. The survey was e-mailed to Ph.D. candidates in the Higher Education Program at the University of Toledo. These candidates were fellow students of the researcher and both willing and able to complete the survey as well as offer constructive criticism. The sample for the pilot testing was a sample of convenience.
**CPA Examination – FAR Section.** The Financial Accounting and Reporting (FAR) section of the CPA examination allows four hours for completion. Ohio candidates apply to take this exam through the CPA Examination Services. This organization processes the application, fees, and eligibility check for the candidate. The computerized exam is held at approved testing centers throughout the state. This section covers: “knowledge of generally accepted principles for business enterprises, not-for-profit organizations and government entities, and the skills needed to apply that knowledge” (NASBA, 2009, p. 28). The test is composed of three test sections of multiple choice questions and two simulations.

**Assumptions**

Although the data collected concentrates on only one section of the exam, it is assumed that the findings can be generalized to all four sections. When Zook and Bremser (1982) studied the impact of academic variables on each of the different sections of the CPA exam, there were five sections. They found that all five sections shared similar variables that had significant predictive value on performance. Russo’s (2002) study also concentrated on the individual sections of the CPA exam – now four sections. Russo’s study agreed with Zook and Bremser’s findings, which indicated that similar variables had a significant influence on the performance of each section of the exam. In both cases, the significant variables were: GPA, CPA review course, and hours of study.

All information is self-reported on the surveys. It is assumed that the candidates who have freely chosen to return the survey have been honest in their responses.

The majority of candidates taking the CPA exam will have earned 150 hours. Although the Ohio State Board of Accountancy requires 150 hours of post-secondary
education to sit for the exam, there are two exceptions. A candidate with either a Bachelor’s or Associates degree, plus a minimum of 620 on the Graduate Management Admission Test (GMAT) and the required accounting and business courses may also sit for the exam. Also, Section 4701.06 of the Ohio Revised Code, allows a candidate who sat for the CPA exam prior to 2002 to be considered grandfathered in under the old rules (Ohio Board of Accountancy, 2009). It is assumed that few candidates are left from that era.

Past research results are mixed concerning the influence of a graduate degree having a significant influence on success on the CPA exam (Zook & Bremser, 1982, Asbaugh & Thompson, 1993, Grant, et. al, 2002, Brahmasrene, & Whitten, 2001). This current research assumed that a graduate degree will be a significant factor in predicting success on the FAR section of the CPA exam.

Summary

This research was a quantitative study that gathered data concerning specific variables that may have a significant influence on success on the FAR section of the CPA exam. The study surveyed Ohio candidates who sat for the FAR section of the CPA exam during 2009 and the first half of 2010. This study expanded on past research by using a more recent sample and by applying Astin’s theory of student involvement.

In using the I-E-O model, the variables are broken down into blocks and are entered into the stepwise multiple regression in the following sequence:

1. Block 1: Input Variables
2. Block 2: Institutional Characteristics (“between” measures)
3. Block 3: Type of degree and program (“between” measures)
4. Block 4: Involvement Factors - Academic

5. Block 5: Involvement Factors - Peers

6. Block 6: Intermediate Outcome variables

In addition to variables that have been proven to be significant as predictors of performance on the CPA exam, involvement and intermediate outcome variables were also analyzed. This study tested Astin’s theory of student involvement to determine what influence, if any, those variables have on performance on the FAR section of the CPA exam.
Chapter 4

Analysis of Data

Accounting educators are continually seeking ways to better prepare their students for success after graduation. One path to this goal is the successful completion of the CPA exam. This national exam provides an endorsement of the knowledge and comprehension that has been achieved by the candidate and opens up opportunities for advancement. The researcher concentrated specifically on Ohio candidates who sat for the Financial Accounting and Reporting Standards (FAR) section of the CPA exam during 2009 and 2010.

This chapter presents the results of the data analysis from the on-line survey administered to those candidates. This research addresses the various academic factors that are hypothesized to have influenced performance on the FAR test. The study applies Astin’s Theory of Student Involvement, which is based on the assumption that if students are involved with or committed to their education, they will achieve higher levels of success, and uses Astin’s Input-Environment-Output conceptual framework. The variables are illustrated in Figure 2, in Chapter 3. They are organized into seven blocks – in the order in which they were entered into the stepwise regression. The first four blocks pertain to the respondents and the institutions of higher education and academic programs. The descriptive characteristics of the respondents, the institutions of higher education and the academic programs are examined first, followed by the results of the stepwise regression analysis.
Data Collection and Response Rates

In gathering the data, a total of two groups (1,861 individuals) of Ohio candidates who sat for the FAR section of the CPA exam were used. All of these candidates were e-mailed an online survey. The e-mail addresses of Ohio candidates for the CPA exam were purchased from The National Association of State Boards of Accountancy (NASBA) with permission from Robert Joseph, Assistant Director of the Ohio State Board of Accountancy. The first group (Group 1) included 1,381 Ohio candidates, who sat for the FAR section of the exam in 2009, and the second group (Group 2) included 480 candidates who sat during the first half of 2010.

In determining that sufficient data were gathered for this study, the researcher considered the size of the population and the confidence level (.95) required. A sample size table constructed by Krejcie and Morgan (1970) suggests that between 306 and 317 cases be used.

Table 1

Survey Results – Response Rate

<table>
<thead>
<tr>
<th>Mailings</th>
<th>Group 1 (n = 1,381)</th>
<th>Group 2 (n = 480)</th>
<th>Total (n = 1,861)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N   %</td>
<td>N   %</td>
<td>N   %</td>
</tr>
<tr>
<td>1st</td>
<td>140  9%</td>
<td>96  20%</td>
<td>236  13%</td>
</tr>
<tr>
<td>2nd</td>
<td>78   5%</td>
<td>48  13%</td>
<td>126  7%</td>
</tr>
<tr>
<td>Total Response</td>
<td>218  14%</td>
<td>144  13%</td>
<td>362  19%</td>
</tr>
</tbody>
</table>

A letter (Appendix B) requesting participation in the study along with the link to the survey were e-mailed to all candidates in Group 1. The results of the first e-mailing
resulted in a 9% response rate – a total of 140 respondents. A second e-mailing resulted in a 5% response of the remaining candidates – for a total of 218 cases. Since these mailings did not provide a sufficient number of respondents, a second e-mail list of Ohio candidates who sat for the FAR section of the CPA exam during the first half of 2010 was purchased from NASBA. A new introductory letter (Appendix C), which emphasized the value of the candidates’ response to the survey was prepared in order to encourage a bigger response rate. E-mails were sent to the candidates in Group 2. The first attempt resulted in an approximate 20% response rate - a total of 96 respondents. A second e-mailing to the remaining 384 candidates who did not respond to the first e-mail resulted in an approximate 13% response - a total of 48 respondents - for a final total of 144 responses. The combination of the two lists and four e-mailings resulted in 362 responses.

The survey asked all candidates to report either their ACT or their SAT scores. The majority of respondents reported their ACT scores. The SAT scores of those candidates who did not also report ACT scores were converted to ACT scores using the ACT/SAT concordance chart (http://www.act.org/aap/concordance/). Of the 362 respondents, 310 included the ACT or equivalent SAT scores. In order to determine that the pre-test (ACT/SAT) proved to be a significant predictor of the dependent variable (FAR score), only those surveys with the actual ACT/SAT scores and the actual FAR scores were analyzed with a multiple regression. Since the pre-test did prove to be significant, those cases missing the ACT/SAT were retained in the data. Any surveys missing the actual score on the FAR test (dependent variable) were eliminated from the study. After these eliminations, the final number of valid surveys totaled 353, which fit
within the requirement boundaries. The data from these surveys were used in the multiple regression analysis and were the basis of the findings of this study.

**Descriptive Characteristics of the Sample Population**

The variables in Blocks 1 and 2 comprised the input section of the I-E-O model that included questions pertaining to the ACT score, gender, and race. These variables were used in order to determine if these personal characteristics had any influence on predicting performance on the FAR test.

![Figure 3. ACT Frequency Distribution – Reported Scores](image)

The ACT score had a normal frequency distribution with a mean of 26.05 and a standard deviation of 3.49. The ACT served as the pre-test for predicting performance on the FAR test. Overall, no significant differences were noted in the ACT score by gender and race.
Table 2

*Gender and Race*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total (n = 353)</th>
<th>Total (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Male</td>
<td>190</td>
<td>54%</td>
</tr>
<tr>
<td>Female</td>
<td>163</td>
<td>46%</td>
</tr>
<tr>
<td>Total</td>
<td>353</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Total (n = 353)</th>
<th>Total (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>White</td>
<td>317</td>
<td>90%</td>
</tr>
<tr>
<td>Non-White</td>
<td>32</td>
<td>9%</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>353</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2 shows the distribution of the sample population by gender and race. The sample population was made up of 54% males and 46% females, compared with the total population of 52% males and 48% females. Although these two trends have a similar higher male-to-female ratio, it is interesting to note that a national study by The American Institute of Certified Public Accountants (AICPA, 2009) shows the trend of graduates earning a Bachelor’s degree in accounting have a higher female-to-male ratio (53%-47%). In addition, the same AICPA study found that 30% of accounting graduates have minority or unknown racial background (AICPA, 2009). Master’s programs in
accounting have a 50/50 ratio of females to males. The lower percentage of minorities sitting for the CPA exam may suggest that professional certification presents additional barriers to this demographic group.

To summarize, the majority of the respondents were white males. The ACT mean was 26.05, with a normal frequency distribution and a 3.49 standard deviation.

**Carnegie Classifications of Respondents Institutions**

Block 3 contains the institutional characteristics. The 353 Ohio candidates who sat for the FAR test completed their education at 73 discrete institutions of higher education (includes undergraduate and graduate). As expected, the majority of the candidates (88%) in the sample population received their degrees from Ohio universities. The remaining candidates (12%) graduated from institutions from neighboring states, such as Indiana, Kentucky, Michigan and Pennsylvania, with a few outliers in other states.

The institutions of higher education are categorized according to the Carnegie classifications as to control (public, private not-for-profit, private for-profit), selectivity (inclusive, selective, more selective), and size (Small - under 3,000; Medium - 3,000-13,000; and Large - over 13,000) (http://classifications.carnegiefoundation.org). The sizes ranged from 515 students (Myers University) to 68,064 students (Arizona State University).
Table 3

*Carnegie Classifications – Control, Selectivity, Size*

<table>
<thead>
<tr>
<th>Institutional Characteristics</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Total Number of Respondents</td>
<td>353</td>
<td>100%</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>229</td>
<td>65%</td>
</tr>
<tr>
<td>Private-Not-for-Profit</td>
<td>120</td>
<td>34%</td>
</tr>
<tr>
<td>Private-for-Profit</td>
<td>4</td>
<td>1%</td>
</tr>
<tr>
<td>Selectivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusive</td>
<td>37</td>
<td>11%</td>
</tr>
<tr>
<td>Selective</td>
<td>167</td>
<td>47%</td>
</tr>
<tr>
<td>More Selective</td>
<td>149</td>
<td>42%</td>
</tr>
<tr>
<td>Undergraduate Enrollment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 3,000</td>
<td>41</td>
<td>12%</td>
</tr>
<tr>
<td>3,000 – 13,000</td>
<td>95</td>
<td>27%</td>
</tr>
<tr>
<td>Over 13,000</td>
<td>217</td>
<td>61%</td>
</tr>
</tbody>
</table>

In summary, the majority of respondents - both undergraduate and graduate - attended large public institutions with selective or more selective admission standards as reported in Table 3. It is interesting to note that a small number of private-for-profit institutions were represented at both the undergraduate and graduate levels, although a greater percentage of this type of institution was accounted for on the graduate level.
Program Characteristics

The variables pertaining to the characteristics of the academic programs are located in Block 4 of the regression. The respondents were asked to identify their undergraduate major and, if applicable, the type of graduate degree they completed. The academic backgrounds of both undergraduate and graduate respondents and the FAR mean scores are presented in Table 4. Since the content and process of completing the CPA exam has been substantially changed in recent years in an effort to promote critical thinking and problem-solving, this researcher is interested in determining which program variables, if any, influenced performance on the FAR test.

Table 4

Undergraduate Major by FAR Mean

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>FAR Mean</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>80.14</td>
<td>268</td>
<td>76%</td>
</tr>
<tr>
<td>Finance</td>
<td>78.08</td>
<td>24</td>
<td>7%</td>
</tr>
<tr>
<td>Other Business Fields</td>
<td>79.54</td>
<td>24</td>
<td>7%</td>
</tr>
<tr>
<td>Non-Business</td>
<td>81.03</td>
<td>37</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>80.08</td>
<td>353</td>
<td>100%</td>
</tr>
</tbody>
</table>

Graduate Degree by FAR Mean

<table>
<thead>
<tr>
<th>Graduate Degree</th>
<th>FAR Mean</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSA (Masters in Accountancy)</td>
<td>82.78</td>
<td>88</td>
<td>49%</td>
</tr>
<tr>
<td>MBA</td>
<td>78.56</td>
<td>84</td>
<td>47%</td>
</tr>
<tr>
<td>Other</td>
<td>78.00</td>
<td>8</td>
<td>4%</td>
</tr>
<tr>
<td>Total</td>
<td>80.60</td>
<td>180</td>
<td>100%</td>
</tr>
</tbody>
</table>

In summary, the majority of the respondents were undergraduate accounting majors. More than half of all respondents (51%) completed a graduate degree. The FAR mean for the total respondents was 80.08, as compared with 80.60 for those candidates
who completed a graduate degree. MSA (Masters of Accountancy) graduates were likely to have higher FAR scores (mean = 82.78) than graduates of other programs.

**Dependent Variable**

The score on the FAR test was selected as the dependent variable because this particular section of the CPA exam covers all areas of accounting (public, private, not-for-profit, and governmental) (National Association of State Boards of Accountancy, NASBA, 2010), requires intensive preparation, and is normally the first exam that students take in their quest for public accounting certification.

![Frequency Distribution of FAR Scores](image)

*Figure 4. FAR Score Frequency Distribution*

A passing score of 75% is required. Figure 2 shows the range of scores from 43 to 98, with a normal frequency distribution and a mean of 80.08. The pass rate for the respondents to this survey is 81%. The pass rate for the FAR test for both national and Ohio candidates is an average of 52% (NASBA, 2010). The difference of these pass
rates may be attributed to the fact that completion of this survey was voluntary. This suggests that candidates who passed the FAR test were more likely to respond to the survey than those who did not pass. This could be a limitation to this research.

In summary, the FAR score, the dependent variable, serves as a continuous dependent variable, with a normal frequency, a mean of 80.08, and a standard deviation of 8.19.

**Analysis and Findings**

The previous section covered the descriptive statistics, giving the researcher a composite picture of the respondents and their experiences in higher education. To continue the analysis, a stepwise multiple regression was used to determine which variables, if any, influenced performance on the FAR section of the CPA exam. The actual scores for the FAR score (dependent variable) were used. Only 10% of the respondents had completed the information for the undergraduate GPA and the graduate GPA variables on the survey. Because of the low response, those variables were dropped from the study. For all other missing information, the omitted values were replaced with the mean response for the variable.

A stepwise multiple regression model was used for this study. This method is appropriate when there are a large number of independent variables. This allows the researcher to control for the influence of the input variables. With each step, the model calculates an F statistic which is equal to T squared, and variables with the lowest F values are eliminated (George & Mallery, 2000). In this manner, the variables that are the weakest predictors of the dependent variable are dropped as additional blocks of
variables are added into the equation. The procedure continues until the final result produces the optimum model with the most significant variables.

The variables were arranged in blocks, and were entered individually into the regression so that the researcher could determine what influence, if any, the predictor variables had on the criterion variable. A level of $p < .05$ was used to determine the significance of each predictor variable.

**Review of the Research Questions**

The following five research questions were addressed in this study on the student involvement variables in higher education and their influence on the score on the FAR exam.

1. What student characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

2. What institutional characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) of the Uniform CPA exam?

3. What accounting program characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

4. What student involvement variables, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?
5. What intermediate education outcomes, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

**Regression Model Predicting FAR Score**

A total of 58 variables arranged in 7 blocks were entered into the stepwise multiple regression. The order of the entry of the variables follows the I-E-O conceptual framework. Astin (1999) conducted longitudinal research on how students developed throughout their undergraduate programs. The input variables include student characteristics present when they enter college. These variables are entered first to control for their potential biasing influence on the dependent variable. These include the ACT scores (block 1) and demographic information (block 2). The environmental variables are: institutional characteristics (block 3); program characteristics (block 4); involvement variables–faculty (block 5); involvement variables–peers (block 6); and intermediate outcomes (block 7). See Figure 2, Chapter 3 for a complete listing of all the variables within each block. The outcome – dependent variable – is the score on the FAR test. The order of these variables follows the student’s temporal progress through the academic process (Astin, 1999).

The ANOVA (Analysis of the Variable) helps to determine how well the model is able to predict the outcome (Field, 2009). The F score paired, with a p-value, tests the null hypothesis that the variables/predictors have no relationship to the dependent variable. For this regression, the F statistics were paired with p values that are <.05. These findings indicate that that the null hypothesis is false, and that the model is a good fit.
Multicollinearity occurs when independent variables are closely related to one another, making it difficult to determine the significance of the variables (George & Mallery, 2000). A close look at the collinearity diagnostics, which included the tolerance and variance inflation factor (VIF) scores, highlighted any potential problems. Variables with tolerance below .10 or VIF above 10 were examined closely. It was determined that there were no major issues with collinearity.

Table 5

*Predictor Variables of FAR Score*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Block</th>
<th>Zero r</th>
<th>Step Beta</th>
<th>Beta</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Composite Score</td>
<td>Inputs</td>
<td>.21**</td>
<td>.18**</td>
<td>.13**</td>
<td>11.76**</td>
</tr>
<tr>
<td>Masters of Accountancy Program</td>
<td>Characteristics</td>
<td>.26**</td>
<td>.17**</td>
<td>.15**</td>
<td>11.2**</td>
</tr>
<tr>
<td>UG – Employment Involvement</td>
<td>-</td>
<td>-.18**</td>
<td>-.16**</td>
<td>-.14**</td>
<td>10.85**</td>
</tr>
<tr>
<td>UG – Tutor Other Students</td>
<td>Involvement</td>
<td>.15**</td>
<td>.12**</td>
<td>.16**</td>
<td>9.59**</td>
</tr>
<tr>
<td>UG – Study With Other Students</td>
<td>Involvement</td>
<td>-.08**</td>
<td>-.19**</td>
<td>-.18**</td>
<td>9.59**</td>
</tr>
<tr>
<td>GR – Socialize With Other Students</td>
<td>Involvement</td>
<td>.17*</td>
<td>.13**</td>
<td>.13**</td>
<td>9.59**</td>
</tr>
<tr>
<td>Self-Rating: Intellectual Self-Esteem</td>
<td>Intermediate Outcomes</td>
<td>.21*</td>
<td>.16**</td>
<td>.16**</td>
<td>8.83**</td>
</tr>
</tbody>
</table>

Note: Sample Size n = 353, Mean = 80.06, SD = 8.19, $R^2 = .17$, Adjusted $R^2 = .15$, *p<.05; **p <.01

The variables that emerged as significant predictors of performance on the FAR test are presented in Table 5. Zero r value measures the Pearson Product Moment Correlation between the independent variables and the dependent variables to determine
the strength and direction of the relationship. The beta weight is also an important statistic in predicting the influence of the independent variables on the dependent variable. Just like the Pearson correlation, the beta weight fluctuates between +1 and -1 and acts as a partial correlation by distributing the influence among the other variables. The beta weight of one variable may explain the influence of another variable (George, et. al., 2009). These statistics are also standardized, which allows the researcher to make comparisons.

The Beta weights are presented for the variables that proved to be significant. They are listed in two different steps: the step block - the block that the variable first appears in the model - and the final step of the regression model. The footnote at the bottom of the table shows the mean FAR score of 80.06, with a standard deviation of 8.19.

The following ranking lists the variables that met the significance requirement, beginning with the strongest influence in the final model: Undergraduate – Study with Other Students (Beta = -.18, p < .05), Intellectual Self Esteem (Beta = .16, p < .05), Undergraduate – Tutor Other Students (Beta = .16, p < .05), MSA, Masters of Accountancy (Beta = .15, p < .05), Undergraduate – Employment ( Beta = -.14, p < .05), Graduate – Socialize with Other Students (Beta = .13, p < .05), and ACT Composite Score (Beta = .13, p < .05).

Two variables - Undergraduate – Study with Other Students and Undergraduate – Employment had a negative direction of influence. The other five variables had a positive direction of influence. The final adjusted R² indicated that 15% of the variance
of the score on the FAR exam is explained by the seven predictor variables listed in Table 5.

The Pearson Product Moment Correlation (Appendix D) shows the relationships among all the predictor variables. The strongest association is between MSA and UG-Tutor Other Students (.79). UG-Study with Other Students is negatively correlated with Intellectual Self-Esteem (-.03) and with UG-Employment (-.08).

**Research Question Analysis**

The first research question asked if the ACT score or candidates’ demographic background had any influence on the FAR test.

The ACT scores were entered into the first block, and the demographic variables (gender, race) were entered into the second block. Only one variable - ACT Score (Beta = .13, p < .05) - emerged as a significant positive predictor for performance on the FAR test of the CPA exam. This variable served as a pre-test for the dependent variable. Thus, respondents with higher ACT scores tended to perform better on the FAR test.

The second research question asked if any of the institutional characteristics influenced the outcome on the FAR test. The institutional variables entered into Block 3 included institutional characteristics of control, size and selectivity. None of these variables proved to be significant predictors of the dependent variable.

The third research question asked if any of the accounting program characteristics influenced the outcome on the FAR test. The program variables entered into Block 4 included undergraduate majors and graduate programs that the candidates had completed. The MSA, Masters in Accountancy (Beta = .15, p < .05), proved to be a significant
positive predictor of performance on the FAR test. Thus, candidates who completed the MSA degree performed better on the FAR test than those who did not.

The fourth research questions asked if any student involvement variables influenced the outcome on the FAR test. Blocks 5 and 6 included the involvement variables relevant to this research question. Four involvement variables were found to be significant predictor variables. UG – Study with Other Students (Beta = -.18, p < .05) had a negative influence on performance on the FAR test, thus undergraduates who studied together did not perform as well on the FAR as those who did not. UG – Tutor Other Students (Beta = .16, p < .05) had a positive influence on performance on the FAR test. Thus, undergraduates engaged in tutoring performed better on the FAR than other candidates who did not tutor. UG-Employment (Beta = -.14, p < .05) had a negative influence on performance on the CPA exam. Consequently, the more hours that an undergraduate worked negatively affected performance on the FAR test. GR – Socialize with Other Students (Beta = .13, p < .05) was positively associated with performance on the FAR test. Thus, those graduate students who interacted with one another performed better on the FAR test than other graduate students who did not.

The fifth research question asked if any of the intermediate educational outcomes influenced the outcome of the FAR test. Block 7 contained the intermediate educational outcomes. One independent variable proved to be a significant predictor variable: Self-Rating: Intellectual Self-Esteem (Beta = .16, p < .05) had a positive influence on the FAR test. Thus, respondents who rated themselves higher on Intellectual Self-Esteem performed better on the FAR test than those who did not rate themselves high on Intellectual Self-Esteem.
To summarize, a stepwise multiple regression analysis was conducted to discover what variables, if any, significantly influence performance on the FAR test of the CPA exam. Seven blocks of variables were entered sequentially into the regression analysis and seven independent variables were determined to be significant.

**Summary**

A quantitative analysis was conducted to examine which institutional, program, and involvement variables present in Ohio universities and colleges are significant in contributing to student success on the FAR section of the CPA exam. The study applied Astin’s Theory of Student Involvement and used his Input-Environment-Output (I-E-O) conceptual framework. Data were collected via an on-line survey to Ohio candidates who sat for the FAR test in 2009 and 2010.

Descriptive statistics provided the characteristics of the sample population, institutions and programs. The final model of the stepwise regression analysis resulted in seven significant predictor variables: ACT, MSA Master’s in Accountancy), UG-Employment, UG-Tutor other students, UG-Study with Other students; GR Socialize with Fellow Students and Self-Rating: Intellectual Self-Esteem. These variables explained 15% of the variance of the score on the FAR exam. UG-Employment and UG-Study with Other Students negatively influenced performance on the FAR test. All other significant variables positively influenced the dependent variable.
Chapter 5

Discussion, Recommendations, and Conclusions

Chapter 4 presented the outcomes of the data analysis from the on-line survey. This chapter will present a summary this study, its analysis and findings in detail by research question, implications for theory and practice, limitations of the study, suggestions for future research, and contributions of the study to the literature.

Summary of the Study

The purpose of this study was to determine what variables influence success on the Financial Accounting and Reporting Standards (FAR) section of the CPA exam. Identifying these variables is useful to accounting educators in their ongoing endeavors to improve the educational environment for their majors.

Accounting educators encourage their students to seek professional certification, and the CPA exam provides a path towards this goal. The national CPA exam has been substantially updated in both content and process. The problems and cases require critical thinking skills, and the computer-based test facilitates the candidates’ use of research in solving complex situations.

This study applied Alexander Astin’s Theory of Student Involvement, which is based on the assumption that students who are more involved with their education will achieve higher levels of success. The Input-Environment-Outcome-Model (I-E-O) was used as the conceptual framework for this study. An original on-line survey (Appendix A) was created to gather data for this study. Before launching the survey to the CPA candidates, a pilot study was sent to a group of graduate students at one Ohio institution. This afforded the opportunity to test the mechanics of the on-line survey, and to receive
feedback from the recipients on the clarity and ease of completing the survey. After making necessary adjustments and receiving additional feedback from the dissertation committee members, the survey was sent to candidates who sat for the FAR section of the CPA exam in Ohio during 2009 and 2010. The total population, consisting of 1,861 candidates, resulted in 362 respondents (19% response rate) with 353 usable cases.

The data gathered from this survey were analyzed using a blocked form of stepwise regression. Frequencies, means, and standard deviations were calculated using basic statistical procedures. Seven predictor variables were found to influence performance on the FAR test. Of the seven predictor variables identified, one was an input characteristic, and the remaining six were environmental characteristics.

The literature review covered research that showed several variables (ACT, MBA, GPA, etc.) that have been proven to be significant predictors of performance on the CPA exam. This study validated those previous findings by testing many of these variables. The introduction of involvement variables and their relation to performance on the FAR test establishes a new research focus to what factors contribute to performance on this particular national exam. This study contributes to the literature and opens up a new area of research for improving the learning environment for accounting students.

**Analysis and Findings**

The analysis identified seven significant predictor variables that contributed to success on the FAR test. The seven predictor variables were distributed throughout the categories or blocks in which they were organized. The allocation of the predictor variables is as follows: one input variable – ACT score; one program variable - The Masters of Accountancy Program; four involvement variables - Undergraduate/
Employment, Undergraduate Study with Other Students, Undergraduate/Tutor Other Students, Graduate/Socialize with Fellow Students; and one intermediate outcome variable – Self Rating: Intellectual Self-Esteem.

The results of the study show how students may be influenced through their learning environment. Each significant predictor is discussed in terms of the research question addressed and how this may relate to program and policy issues.

Research Question 1: *What student characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?*

The input variables of ACT/SAT score (Block 1), and Race and Gender (Block 2), were entered into the regression to determine if any characteristics with which the candidates came to college influenced their performance on the FAR test.

Race and Gender were not found to be significant predictor variables. The ACT score was found to be a significant predictor of success on the FAR test (a subset of the CPA exam). This finding is consistent with previous studies (Zook & Bremser, 1982; Asbaugh & Thompson, 1993; Grant, et al., 2002; Raghunandan, et al., 2003) which all found the ACT score to be a significant influence on the CPA exam. As anticipated, the ACT score again proved to be a significant factor in positively influencing performance on the FAR test. The results of this survey lend credibility to the hypothesis that candidates who enter college with a certain level of college readiness will do well on this standardized test. Admissions counselors widely use the ACT as a means of predicting students’ success in college, and this study supports that practice.
Research Question 2: *What institutional characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) of the Uniform CPA exam?*

Undergraduate and graduate institutional characteristics, such as size, control, and selectivity (Block 3), were included in this category. Although no institutional variables were found to be significant predictors of performance on the FAR test, it is interesting to note the concentration of large public universities offering the Masters in Accountancy (MSA), which was found to be a predictor variable. Of the 180 candidates who completed a graduate degree, 88 candidates earned the MSA. The MSA is offered at mainly large public institutions. Twenty-four discrete institutions offering the MSA were represented by the respondents, of which 17 were public, and all but one of the public institutions were categorized in the large (> 10,000 students) Carnegie classification. This indicates that large, public institutions predominately offer the MSA program.

Research Question 3: *What accounting program characteristics, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?*

The program variables (Block 4) included majors and graduate programs that the candidates had completed. Previous research by Deppe, et al., (1992) found that completion of the MSA degree contributed to a higher success rate on the CPA exam. This study also found that the MSA was a strong positive predictor of success on the FAR test.

But what is it about the MSA that contributes to that success? Weir, Stone and Hunton (2005) investigated the possible contribution that a MSA program had, not just...
on the exam, but on the graduate’s job performance. The researchers’ findings on the value of the MSA were focused on two types of skills - technical and tacit. The technical, analytical skills pertain to the subject knowledge that a student with a graduate degree in accounting is expected to attain. The tacit skills include “leadership, goal setting, self-improvement, and relationship building” (Weir, et al., p. 89). It is anticipated that both sets of skills are developed during the course of graduate education. Weir, et al., found that a combination of the two skill sets positively contribute to job performance. This research ties in with Astin’s focus on the development of student talent, which includes technical expertise, critical thinking and communication skills. In agreement with Astin (1993), Weir, et al., recognize that the development of these skills takes place over the student’s college career.

In addition to the above, previous research indicates that the peer group provides a powerful source of influence. Astin’s research has found that student-student interaction has a “pervasive pattern of positive benefits” (1993, p. 385). Some of the strongest positive correlations concern a number of outcomes such as degree aspirations, self-reported growth in academic ability, and intellectual self-esteem.

Specifically, Astin (1993) has linked peer groups with a number of common variables --selectivity, program, academic ability, and intellectual self-esteem. These are all variables present in the peer group enrolled in the MSA program. The intellectual self-esteem of the peer group has been found to contribute positively to performance on standardized tests, in this case, the FAR test. Astin notes that this could be a result of the students continuously mixing with other “highly, able, confident, and motivated students” (Astin, p. 211). The MSA students are enrolled in the same classes, and engaged in
similar projects. They share common goals of completing a graduate degree as a path to qualify for professional certification and/or to advance in their field.

This environment of academic support and competition encourages them to strive harder to meet goals. The students are sharing information about their plans and tactics for taking the different sections of the exam. They are educating one another the “tricks of the trade” (Astin, p. 211) for improving performance on these exams. The peer group provides motivation for achievement and validation of the importance of their goals.

Enrollment in MSA programs has been increasing (AICPA, 2009). The MSA appears to be the logical route to take because of the intense focus this program has for someone going into public accounting. This program addresses the complex current issues in accounting, such as the codification of accounting principles and guidelines, the ongoing convergence with international standards, and current auditing failures due to lapses in ethics and auditor independence. At the same time, the program gives the students the opportunity to socialize with one another, to discuss essential issues pertaining to the accounting profession, and to encourage each other in the common pursuit of professional certification.

Research Question 4: What student involvement variables, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

These variables were separated into two blocks. Although both of these sets of environmental variables study the student’s interaction with the learning environment, the individual blocks are distinguished by the type of concentration. The academic block (block 5) focuses on student involvement in the general educational environment and
with faculty, while the peer involvement block (block 6) focuses exclusively on interaction with peers (Block 6).

The academic involvement variables included variables pertaining to employment hours, study hours, and interaction with faculty. There were three undergraduate variables which proved to be significant: UG-Employment, UG-Study with other students, and UG-Tutor other students, and one graduate peer involvement variable, GR-Socializing with other students.

UG – Employment: This variable has a negative Beta weight, which indicates that the more hours undergraduates were employed, the less well they performed on the FAR test. This variable did not distinguish the type of employment or whether the employment was on or off-campus. Therefore, the assumption is that students working long hours while enrolled in college do not perform as well as students who do not work as many hours. Involvement is limited because students working a large number of hours are not as able to participate in campus activities, socialize with fellow students, or meet with faculty as frequently as students who are working fewer hours. This, in turn, may have had a negative effect on performance on the FAR test.

UG - Study with Other Students: This peer involvement variable also had a negative Beta weight, which indicated that performance on the FAR test was adversely affected by the higher number of times that a student studied with his/her peers. In addition, UG-Study with Other Student was negatively correlated with another predictor variable, Self-Rating: Intellectual Self-Esteem. These correlations suggest a number of possibilities including: 1. Students with lower self-esteem ratings may have required additional assistance with the academic material and sought to study with other students.
2. Students who seek out other students to study with may be weaker students, and consequently perform at a lower level on the FAR test. 3. Students who study alone may tend to do better on the FAR test than do students who study in groups.

UG – Tutor Other Students: We would expect that students who tutor other students are knowledgeable of the subject matter, and by tutoring they are sharpening their own comprehension of the material. Students who tutor are expected to be able to interpret, explain, and break down complex issues. Such skills positively affect performance on the FAR test.

Studies from the Cooperative Institutional Research Program (CIRP) found that some of the variables that correlated positively with tutoring are: serving as teaching assistants, hours spent outside of class speaking with a professor, enrollment in an honors program, and GPA (Astin, 1993). In this study, UG-Tutor Other Students was positively correlated with the self ratings of: intellectual self esteem, academic ability, drive to achieve and writing ability. This suggests that students who are engaged in tutoring are also actively involved in their education and that they have high levels of academic self-confidence.

GR – Socialize with Fellow Students: Graduate students who socialize outside of class with other students tend to perform better on the FAR test than those students who do not. The graduate community is bound by a common goal. Interaction with peers solidifies commitment to that goal (Deppe, et al., p. 20). Deppe, et al., also noted that, in general, graduate programs tend to have smaller class sizes and that students tend to interact more frequently with their professors. These characteristics are embedded into
graduate programs and suggest that graduate students tend to have a high level of involvement with their education.

As discussed above, peer groups constitute a principal influence on behavior. This concept is not surprising. The choice of a peer group sets in motion interaction within an academic environment that will influence behavior. By socializing with a group of individuals who are committed to completing their degree, and pursuing professional certification, these individuals tend to experience a higher level of success, as measured by performance on the FAR test.

Research Question 5: What intermediate education outcomes, if any, influence the success of candidates on the Financial Accounting and Reporting Standards (FAR) section of the Uniform CPA exam?

The intermediate education outcomes (Block 7) included Self-Ratings of Intellectual Esteem; Academic Ability, Writing Ability, Speaking Ability, and Achievement. One self-rating variable was found to be a significant predictor - Self Assessment of Intellectual Self-Esteem. Candidates who rated themselves higher on intellectual self-esteem tended to perform better on the FAR test. Research by Astin and others has found time and again that Intellectual Self-Esteem is a predictor of performance on national exams, for example on the LSAT (Astin, 1993), and the NTE (Opp, 1992).

Astin (1993) explains the significance of this variable by suggesting that individuals group themselves with like-minded peers who put time and energy into achieving common goals. The academic environment among these peers promotes a certain level of competition. Such an atmosphere may encourage a more active
involved in their educational endeavors, leading to a higher rate of success on standardized tests. Performance on standardized tests is used as a measure of a learning outcome of a college education. This is considered an appropriate tool because the talent development needed to satisfactorily complete the test is acquired throughout the college career. Standardized tests measure language skill, math, and analytical and problem solving skills and serve as a gateway into graduate or professional schools, or in the case of the FAR test, to professional certification.

**Implications for Theory and Practice**

The results of the study support the theoretical framework that drove this research. In addition, this study provides ideas for practice. The following sections describe these implications.

**Implications for Theory**. Astin’s theory of student involvement was shown to be useful in determining that student involvement had a positive influence on performance on the FAR test of the CPA exam. Astin’s theory of student involvement is based on the hypothesis that the more that students are engaged in their education, the more success they will experience. Involvement is described as a commitment that is both psychological and physical (Astin, 1999). In his goal to discover how students can achieve academic excellence, Astin’s research looked at what elements best contribute to building a foundation for a constructive learning environment.

This study found four involvement variables to be significant predictors of performance on the FAR test. Two of the predictors: UG – Tutor Other Students, and GR – Socialize with Fellow Students, positively influenced performance on the FAR test. The student/student relationships constitute an important element in contributing to a
learning environment that encourages involvement in the educational process and contributes to accomplishment of learning outcomes. The more opportunities students have to develop relationships on campus enhance their involvement. These relationships, particularly between peers, encourage involvement and increase consequent positive outcomes, such as performance on the FAR test.

Astin’s theory is important because it has implications for teaching methods, programs, and academic resources. The student’s level of energy and engagement with the learning process provided by the college, influences the student’s development of talent.

**Implications for Practice.** The practice implications that can be made from this study involve both institutional and program components. The findings of this study identified specific involvement variables that predicted success on the FAR test. These same variables have been found to predict success on other standardized tests as well. Therefore, institutions can use this information to shape a learning environment that will lead to success on professional tests.

In particular, peer interactions were shown to be of benefit in acquiring the talents for improving performance on the FAR test. Both administrators and educators should seek out resources that encourage greater student engagement in the higher educational process. By cooperating with one another, administrators and educators can garner the necessary resources and encourage student involvement.

One of the strongest predictors of success on the FAR test was the MSA degree. Not every institution has the resources to offer a Masters in Accountancy program. However, certain involvement variables inherent in this program proved to be significant.
The peer factor is so strong that other graduate programs or even undergraduate programs could establish opportunities for students to interact with one another to take advantage of the possible benefits that peer interaction provides. For example, the peer involvement variable, UG-Tutoring other students, proved to be a positive significant variable. Establishing a designated space to provide a place for study groups to gather and provide peer tutoring services would encourage interaction with highly motivated, knowledgeable students. The peer involvement variable allows students to learn from one another.

Additional involvement variables that positively influenced performance on the FAR test were GR-Socialize with Other Students and Intellectual Self-Esteem. These findings come as no surprise in that members of peer groups help one another by providing encouragement or academic assistance when situations become challenging or frustrating. Student life administrators can use these findings to develop specific activities or programs to enhance involvement. By providing academic seminars and social activities, students receive encouragement and provide helpful information to one another. Seminars where the students, themselves, can showcase their own research or present tutorials to their fellow students would be beneficial. A commitment on the part of the institution is required to provide the necessary resources to establish these activities.

The ACT has been shown to be a reliable predictor of success in a number of research studies. Admissions counselors can consider the ACT scores in determining how well a student is prepared for college. This score can also highlight any weaknesses or strengths, thereby, providing information to administrators and educators on where to concentrate certain resources. This information can be used to provide academic
guidance, tutoring or other support services that can assist the student in becoming successful.

Limitations of the Study

It is now clear that a number of limitations were present in this study.

The population for the survey was limited to candidates who sat for the FAR test in one state - Ohio. Each state controls the candidate information, and it is necessary to seek permission from each individual state to conduct a study. The president of the Ohio Board of Accountancy was willing to grant that permission. Other state boards were not willing to give this permission.

The sample population was further limited to those who replied to the original online survey. Response was voluntary, so only those candidates who chose to respond to the survey did so. This affected the type of sample that was studied. The national pass rate for the FAR test is 52%, and the pass rate for the sample was 86%. This suggests that those who did respond may not have represented a broad spectrum of the population of candidates sitting for the FAR portion of the CPA exam. It would have been helpful to have a larger sample that included more candidates who did not pass the FAR test. A larger sample may have produced more significant predictors, either negative or positive, that would have been helpful in analyzing the educational environment for accounting majors.

Information was self-reported. The researcher assumed that the responses were accurate in order to rely on the data for analysis. Since the surveys were anonymous, this may have alleviated the problem of respondents inflating scores or GPA or otherwise responding inaccurately to questions.
In addition, scores were limited to the Financial Accounting and Reporting Standards (FAR) section. Although there are four parts of the exam, only one section was chosen to study. Since the format of the CPA exam has been changed, candidates no longer sit for the entire exam at one sitting, and it would have been difficult to find an adequate sample of candidates who had recently sat for all four sections. The FAR section of the exam was chosen because it requires the most preparation, and covers the basic principles of accounting for public, private, not-for-profit and governmental entities (www.nasba.org/nasbaweb). Other researchers (Russo, 2002, Zook and Bremser, 1982) found focusing on individual sections of the report yielded similar results as studies including all four sections of the exam. Therefore, research on the FAR section of the exam can be treated as representative of the entire CPA exam.

There were some ambiguities in the institutional characteristics. It is not uncommon for college graduates to have attended multiple institutions of higher education. In this research, the subjects’ responses were limited to information on the most recent institution attended. For example, they were asked where their degree(s) were conferred, and information concerning their activities in their final year of college. The respondents may have had a relatively brief experience in the last institution they attended. However, since transfer students have a residency requirement, this would mandate that the major upper-level requirements would have been completed at the last undergraduate institution attended. We can also assume that the majority of candidates who completed a graduate degree attended only one institution for that degree. In addition, almost half of the candidates attended graduate school. This more recent
university experience may have resulted in understating possible significant variables present in the undergraduate institutions.

Regardless of these limitations, these data provide valuable information in exploring which variables in higher education influence the success on the Financial Accounting and Reporting Standards (FAR) section of the CPA exam.

**Suggestions for Future Research**

This study has made a significant contribution to the literature by providing new information gathered from an original survey that contained information about student involvement and its influence on performance on the FAR test. While this study has made a major step in opening up the topic of student development in conjunction with involvement theory, there is still a need for additional research concerning accounting graduates who undertake the task of pursuing professional certification. The study uncovered a number of areas where additional research would be beneficial to understand the educational environment that would best prepare accounting students for undertaking the steps necessary to achieve professional certification.

**Improving the Database/Survey.** The National Association of Boards of Accountancy (NASBA) is responsible for maintaining the national database of CPA candidate information. The organization has the ability to track a “candidates’ history, from initial application to grading of the examination” (nasba.org/products). Every year, NASBA publishes The Candidate Performance on the Uniform CPA Examination. This report organizes the national data on candidates who have taken part in the CPA exam. The information shows the national pass rates for each section of the CPA exam and breaks it down by state and institution.
Although, this information has been found to be useful for much of the research on performance on the CPA exam, it does not address individual educational experiences. There is room for improvement on expanding the data collected on a national level by NASBA. In addition to summarizing the CPA examination results, NASBA also administers a brief questionnaire to candidates. This questionnaire could be improved to provide more useful information by including questions pertaining to student involvement. Detwiler’s (2011) research used the Law School Survey of Student Engagement (LSSSE) to determine the influence of involvement variables on law school GPA. A similar national survey administered by NASBA and tied to performance on all four parts of the CPA exam would provide important information to assist educators and administrators to understand the educational environment that would be most effective in preparing accounting majors for professional certification.

**CPA Review Course.** Another question to be added to the database would ask if the candidate participated in a CPA review course. Several researchers found that participation in a CPA review course was a significant factor in higher pass rates (Zook & Bremser, 1982, Asbaugh & Thompson 1993, Brahmasrene, T., & Whitten, D., 2001, Grant, Ciccotello & Dickie, 2002). Grant, et al., found that after controlling for SAT/ACT scores, participation in a CPA exam review course was a significant factor in influencing success on the CPA exam. NASBA administered a supplementary questionnaire that collected data on whether or not an individual had participated in some form of supplementary study. The results of the data collection found that the averages for passing individual sections of the CPA exam were somewhat higher for candidates who had participated in some form of supplementary study. However, these findings
were inconclusive, and should be “interpreted cautiously” (NASBA, 2009, p 23). It would be worthwhile to include this data in the main section of the annual candidate performance report and have this information available to researchers.

**Underrepresentation of Minorities in Public Accounting.** An analysis of the population in this study showed that the majority of candidates sitting for the FAR section of the CPA examination are white males (54%) with females (46%) and minorities (9%). This is in contrast to the trends in undergraduate accounting education where majors are composed of 53% females, and 30% minorities (AICPA, 2009). Additional research is needed to determine why these groups, particularly minorities, are underrepresented in seeking professional certification.

Albrecht and Sack (2002) were particularly critical of the 150-hour requirement, arguing that the opportunity costs of the additional year of education required for the CPA were responsible for the decrease in accounting majors seeking public certification. Other socioeconomic barriers may exist that are hindering these groups from pursuing professional certification. For example, in addition to the expense of the extra 30 hours, review courses or preparation materials for the CPA exam, and the exam itself are very expensive. There are professional accounting organizations and scholarships for women and minorities designed to encourage acquiring public certification.

**Employment while in College.** This study concentrated on the number of hours that a student was employed while in college. The results of the data analysis showed a negative correlation between the higher number of hours that a student was employed and performance on the FAR test. No distinction was made concerning type or location of employment. There are many possibilities for refining the research in this area. One idea
would be to distinguish the type of employment. Earlier studies by Zook and Bremser (1982) emphasized type of employment rather than hours of employment. They found that candidates who worked in a CPA firm had a higher rate of passing the Theory and Practice (original name of the FAR segment) than those not employed in a CPA firm. It is a common practice for accounting majors to be employed as an intern their final year of either graduate or undergraduate school. The study could include the possible effects of internships on performance on the FAR test.

Another possibility would be to determine if location of employment plays a significant factor. Astin’s studies broke down student employment by on-campus and off-campus locations. His studies showed that a negative correlation exists between students who have a heavy work commitment off campus with a number of academic factors including “completion of a Bachelor’s degree, college GPA . . . , knowledge of a field or discipline, and preparation for graduate school” (Astin, 1993, p. 388). Astin found that undergraduate students who work on campus compensate for the hours spent working by having “more frequent contact with other students and possibly faculty” (Astin, p. 388). This extended presence on campus allows the student to be immersed in the college environment, and this option is not available to those who are working many hours off campus. This would be an interesting area of research to pursue.

**Conclusion**

This dissertation examined the accounting educational environment to determine what factors contribute to successful performance on the FAR section of the CPA exam. The main focus that separates this research from others is the inclusion of involvement variables. In this study, Astin’s theory of student involvement was proven to be effective
in predicting performance on the FAR test. The predictor variables that contributed positively to performance on the FAR test for undergraduate and graduate are: ACT, MSA, UG-Tutor Other Students, GR-Socialize with Other Students, and Self-Rating: Intellectual Self-Esteem. These variables represent four different blocks of the regression model – inputs, program, involvement, and intermediate outcomes. They provide guidance on what elements should be present in the academic program. In particular, the peer group plays an important role in encouraging the pursuit of professional certification. Resources available to students to encourage involvement and to raise the student’s level of engagement with the learning process are important factors in successful talent development.

This study has substantially contributed to the literature by using Astin’s involvement theory and the I-E-O model to predict performance on the FAR section of the CPA exam. Prior research has established that undergraduate GPA and ACT are significant predictors of performance on the CPA exam. This study went further to look at the learning environment of institutions of higher education by using an original survey that included academic and peer involvement variables. This is the first study of CPA candidates that discusses the effect of peer involvement on performance on the FAR test of the CPA exam. In general, researchers, educators and even parents would agree that peer relationships are important in developing a number of skills, both social and educational. However, there is little known about how peer relationships contribute to success on performance on parts of the CPA exam, and this study is a good beginning to this type of research.
This study confirmed that Astin’s theory of Student Involvement was shown to be effective in determining what variables influenced performance on the FAR test. This research focused on a particular type of talent development, performance on the FAR test, and found that various measures of involvement proved to be effective in positively influencing performance on the FAR test. In particular, peer involvement proved to be one of the strongest indicators of success on the FAR test. Those variables that were positively influential included: tutoring other students (undergraduate), socializing with other students (graduate), and intellectual self esteem. It is important to acknowledge that peer involvement plays an important role in encouraging success. Peers will support one another – and will also teach one another how to accomplish their common goals.

By using involvement theory to understand how to improve the learning environment for accounting students, this study provided new, useful information for educators and administrators in their goal of promoting academic excellence.
References


Rocks, J. (2004). Do transfer of learning and student involvement variables affect the student athletic trainer’s outcome on the written simulation scores of the national certification examination? (Doctoral Dissertation, University of Toledo). Retrieved from ProQuest Dissertations and These (AAT 3141043)

Russo, Charles J. (2002). *A study of selected academic variables contributing to success on the uniform CPA examination in Pennsylvania.* (Doctoral Dissertation, Penn State University). College Station, PA:


Appendix A

Survey for CPA Candidates

SURVEY OF OHIO CANDIDATES FOR THE CPA EXAM

<table>
<thead>
<tr>
<th>Educational History</th>
</tr>
</thead>
<tbody>
<tr>
<td>From which Institution did you receive your Bachelor’s Degree:</td>
</tr>
<tr>
<td>____________________________________________________________</td>
</tr>
<tr>
<td>Major:</td>
</tr>
<tr>
<td>____________________________________________________________</td>
</tr>
<tr>
<td>From which Institution did you receive your Graduate Degree:</td>
</tr>
<tr>
<td>____________________________________________________________</td>
</tr>
<tr>
<td>Type: ☐ MBA ☐ MSA ☐ Other __________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>While you were enrolled in college as an undergraduate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were you employed during your undergraduate career?</td>
</tr>
<tr>
<td>☐ Full-time ☐ Part-time ☐ Not Employed</td>
</tr>
<tr>
<td>During your final year in college, how much time, on average, did you spend studying per week?</td>
</tr>
<tr>
<td>☐ Less than one hour ☐ One to five hours ☐ Six to ten hours ☐ Greater than ten hours</td>
</tr>
<tr>
<td>During your final year in college, did you speak with a professor outside of class? ☐ Yes</td>
</tr>
<tr>
<td>☐ No</td>
</tr>
<tr>
<td>If yes, how often? ☐ Frequently (more than 5 times) ☐ Occasionally (1-4 times) ☐ Never</td>
</tr>
<tr>
<td>During your final year in college, did you discuss ideas for a term paper or other project you were completing with a professor?</td>
</tr>
<tr>
<td>☐ Frequently (more than 5 times) ☐ Occasionally (1-4 times) ☐ Never</td>
</tr>
<tr>
<td>During your final year in college, did you discuss your career plans with a professor? ☐ Yes</td>
</tr>
<tr>
<td>☐ No</td>
</tr>
<tr>
<td>If yes, how often: ☐ Frequently (5+ times) ☐ Occasionally (1-4 times) ☐ Never</td>
</tr>
<tr>
<td>During your final year in college, did you participate in any independent research projects?</td>
</tr>
<tr>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>During your final year in college, did you make any class presentations?</td>
</tr>
<tr>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>During your final year in college, did you participate in any group projects?</td>
</tr>
<tr>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>Study with other students: ☐ Frequently (four or more times) ☐ Occasionally (1-3 times) ☐ Never</td>
</tr>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Tutor other students:</td>
</tr>
<tr>
<td>Socialize with fellow students:</td>
</tr>
<tr>
<td>Participate in student organizations:</td>
</tr>
<tr>
<td>Did you hold a leadership role in a student organization?</td>
</tr>
</tbody>
</table>

If yes, can you describe the role? _______________________

---

### While you were enrolled in college as a graduate student:

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequently (more than 5 times)</th>
<th>Occasionally (1-4 times)</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were you employed during your graduate career?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, how much time, on average, did you spend studying per week?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career in college, did you speak with a professor outside of class?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, did you discuss ideas for a term paper or other project you were completing with a professor?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, did you discuss your career plans with a professor?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, did you participate in any independent research projects?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, did you make any class presentations?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During your graduate career, did you participate in any group projects?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study with other students:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tutor other students:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socialize with fellow students:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participate in student organizations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you hold a leadership role in a student organization?</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

---

101
Rate yourself on each of the following traits as compared with your fellow students:

<table>
<thead>
<tr>
<th>Trait</th>
<th>Highest 10%</th>
<th>Above Average</th>
<th>Average</th>
<th>Below Average</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Speaking Ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive to Achieve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectual Self-Confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing Ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Educational Information

Undergraduate GPA: __________

Graduate GPA: __________

Highest level of Education:

- Bachelors
- Bachelors plus 30
- Masters
- Ph.D.
- Other

Please fill in your ACTUAL SCORES for each section of the CPA Exam that you completed:

Score on FAR: 1st Attempt __________ 2nd or Most Recent Attempt __________

Any Other Comments/Observations

Would you like to make any comments regarding your preparation for the CPA exam?

Background Information

ACT (composite score):

SAT:

Age: 20-30 31-40 41-50 51+

Gender: Male Female

Race: White Hispanic African American Asian Other

Thank you for completing this survey.
Appendix B

Introductory Letter to Survey Population – Group 1

Dear _______: 

My name is Linda Campbell. I am a Ph.D. student at the University of Toledo and I am also an Associate Professor in the Business, Accounting and Management Division at Siena Heights University. You are being asked to participate in a study on how your college experiences (both undergraduate and graduate) were meaningful in influencing your achievement on the CPA exam. The information in this survey is being collected as part of my doctoral dissertation at The University of Toledo.

This questionnaire is being sent to all Ohio candidates who sat for the FAR section of the CPA exam during the 2009. This information will be useful to college and university faculty and administrators in order to improve the college experience for accounting majors.

By following the below link, you will find a questionnaire soliciting information about your college experience and the results on the CPA exam. The questionnaire should take 10 to 15 minutes to complete. All of the information obtained will be kept strictly confidential, and your choice to complete the questionnaire is voluntary.
http://vovici.com/l.dll/JGs94D7D9D961L3DL9U137437J.htm

Thank you in advance for your valuable input and participation with this project.

Feel free to contact me with questions related to my research at linda.campbell@rockets.utoledo.edu or contact my dissertation chair, Dr. Ron Opp, at ropp@utnet.utoledo.edu.

Sincerely,

Linda M. Campbell, MBA, CPA
Ph.D. Candidate, University of Toledo
Appendix C

Introductory Letter to Survey Population – Group 2

Subject: Your CPA Exam and College Experience – Ph.D. Student Asks for Your Help in Completing the Attached Survey

Dear CPA Candidate:

I am a Ph.D. student at the University of Toledo in need of your help. I am currently collecting survey data for my dissertation concerning your college experiences (both undergraduate and graduate) and how these experiences were influential in your achievement on the CPA exam. This information will be useful to college and university faculty and administrators in order to improve the college experience for accounting majors.

You are being asked to participate in this survey because you sat for the FAR section of the CPA exam in Ohio. A questionnaire, which would take approximately 10 minutes to complete asks information about your college experience and the results on the CPA exam. All of the information obtained will be kept strictly confidential, and your choice to complete the questionnaire is voluntary. You can access the questionnaire by following this link:

http://vovici.com/l.dll/JGs94D7D9D9F9ldDx9U136812J.htm

Thank you in advance for your valuable input and participation with this project. Feel free to contact me with questions related to my research at linda.campbell@rockets.utoledo.edu or contact my dissertation chair, Dr. Ron Opp, at ropp@utnet.utoledo.edu.

Sincerely,

Linda M. Campbell, MBA, CPA
Ph.D. Candidate, University of Toledo

If interested, see below for more information about the research methods:

Confidentiality:
All information is kept strictly confidential, and no responses can be traced to any individual. The Vovici online software keeps track of who has responded in order to send reminder notices; however, the data is kept separate from the responses.

Data Collection and Analysis:
All data is collected on a SPSS spreadsheet. The data is assembled in an aggregate form in order to run a factor analysis. Again, no data can be traced to any individual respondent or e-mail address.
## Appendix D

### Correlation Matrix

Table 6

<table>
<thead>
<tr>
<th></th>
<th>UG-Study with other students</th>
<th>UG-Tutor other students</th>
<th>ACT Comp Score</th>
<th>MSA</th>
<th>GR-Socialize with fellow students</th>
<th>Intellect Self-Confidence</th>
<th>UG – Employment</th>
<th>Score on the FAR section of the CPA exam:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UG-Study with other</strong></td>
<td>1</td>
<td>.324**</td>
<td>.081</td>
<td>.019</td>
<td>.283**</td>
<td>-.025</td>
<td>-.056</td>
<td>-.082</td>
</tr>
<tr>
<td><strong>students</strong></td>
<td>.000</td>
<td>.000</td>
<td>.153</td>
<td>.803</td>
<td>.000</td>
<td>.644</td>
<td>.297</td>
<td>.123</td>
</tr>
<tr>
<td></td>
<td>353</td>
<td>352</td>
<td>310</td>
<td>179</td>
<td>195</td>
<td>346</td>
<td>353</td>
<td>353</td>
</tr>
<tr>
<td><strong>UG-Tutor other</strong></td>
<td>.324**</td>
<td>1</td>
<td>.080</td>
<td>.020</td>
<td>.095</td>
<td>.079</td>
<td>-.097</td>
<td>.148**</td>
</tr>
<tr>
<td><strong>students</strong></td>
<td>.000</td>
<td>.161</td>
<td>.791</td>
<td>.188</td>
<td>.144</td>
<td>.067</td>
<td>.005</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>352</td>
<td>353</td>
<td>310</td>
<td>180</td>
<td>195</td>
<td>346</td>
<td>353</td>
<td>353</td>
</tr>
<tr>
<td><strong>ACT Comp Score</strong></td>
<td>.081</td>
<td>.080</td>
<td>1</td>
<td>.170</td>
<td>.001</td>
<td>.147**</td>
<td>-.078</td>
<td>.210**</td>
</tr>
<tr>
<td></td>
<td>.153</td>
<td>.161</td>
<td>.037</td>
<td>.989</td>
<td>.010</td>
<td>.173</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>310</td>
<td>310</td>
<td>311</td>
<td>152</td>
<td>167</td>
<td>306</td>
<td>311</td>
<td>311</td>
</tr>
<tr>
<td><strong>MSA</strong></td>
<td>.019</td>
<td>.020</td>
<td>.170</td>
<td>1</td>
<td>.125</td>
<td>-.007</td>
<td>-.110</td>
<td>.255**</td>
</tr>
<tr>
<td></td>
<td>.803</td>
<td>.791</td>
<td>.037</td>
<td>.094</td>
<td>.928</td>
<td>.141</td>
<td>.014</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>179</td>
<td>180</td>
<td>152</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td><strong>GR-Socialize with</strong></td>
<td>.283**</td>
<td>.095</td>
<td>.001</td>
<td>.125</td>
<td>1</td>
<td>.043</td>
<td>-.080</td>
<td>.172**</td>
</tr>
<tr>
<td><strong>fellow students</strong></td>
<td>.000</td>
<td>.188</td>
<td>.989</td>
<td>.094</td>
<td>.552</td>
<td>.266</td>
<td>.016</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td>195</td>
<td>195</td>
<td>167</td>
<td>180</td>
<td>196</td>
<td>193</td>
<td>196</td>
<td>196</td>
</tr>
<tr>
<td><strong>Intellect</strong></td>
<td>-.025</td>
<td>.079</td>
<td>.147**</td>
<td>-.007</td>
<td>.043</td>
<td>1</td>
<td>-.035</td>
<td>.211**</td>
</tr>
<tr>
<td><strong>Self-Confidence</strong></td>
<td>.644</td>
<td>.144</td>
<td>.010</td>
<td>.928</td>
<td>.552</td>
<td>.511</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>346</td>
<td>346</td>
<td>306</td>
<td>177</td>
<td>193</td>
<td>347</td>
<td>347</td>
<td>347</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td>-.056</td>
<td>-.097</td>
<td>-.078</td>
<td>-.110</td>
<td>-.080</td>
<td>-.035</td>
<td>1</td>
<td>-.181**</td>
</tr>
<tr>
<td></td>
<td>.297</td>
<td>.067</td>
<td>.173</td>
<td>.141</td>
<td>.266</td>
<td>.511</td>
<td>.001</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>353</td>
<td>353</td>
<td>311</td>
<td>180</td>
<td>196</td>
<td>347</td>
<td>354</td>
<td>354</td>
</tr>
<tr>
<td><strong>ACTUAL</strong></td>
<td>-.082</td>
<td>.148**</td>
<td>.210**</td>
<td>.255**</td>
<td>.172**</td>
<td>.211**</td>
<td>-.181**</td>
<td>1</td>
</tr>
<tr>
<td><strong>score on the FAR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>section of the CPA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>exam:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05; **p <.01*