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Advances in Accounting Education: Teaching and Curriculum Innovations

Anthony H. Catanach Jr.
Dorothy Feldmann

Editors

ADVANCES IN ACCOUNTING EDUCATION: TEACHING AND CURRICULUM INNOVATIONS

Series Editors: Anthony H. Catanach Jr. and Dorothy Feldmann

ADVANCES IN ACCOUNTING EDUCATION: TEACHING AND CURRICULUM INNOVATIONS

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Send one hard copy (including any research instruments) by regular mail. By email send two files: one with a manuscript copy but without a cover page and one solely with a cover page. Cover pages should list all authors' names

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2. Each paper should include a cover sheet with names, addresses, telephone numbers, fax numbers, and e-mail address for all authors. The title page also should include an abbreviated title that you should use as a running head (see item 7 below). The running head should be no more than 70 characters, which includes all letters, punctuation, and spaces between words.

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4. You should begin the first page of the manuscript with the manuscript's title. DO NOT use the term "Introduction" or any other term at the beginning of the manuscript. Simply begin your discussion.

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Runkel, P. J., & McGrath, J. E. (1972). *Research on human behavior: A systematic guide to method.* New York, NY: Holt, Rinehart and Winston.

Smith, P. L. (1982). Measures of variance accounted for: Theory and practice. In: G. Keren (Ed.), *Statistical and methodological issues in psychology and social science research* (pp. 101–129). Hillsdale, NJ: Erlbaum.

Stout, D. E., & Wygal, D. E. (1994). An empirical evidence of test item sequencing effects in the managerial accounting classroom: Further evidence and extensions. In: B. N. Schwartz (Ed.), *Advances in accounting* (Vol. 12, pp. 105–122). Greenwich, CT: JAI Press.

Sample Journal References

Abdolmohammadi, M. J., Menon, K., Oliver, T. W., & Umpathy, S. (1985). The role of the doctoral dissertation in accounting research careers. *Issues in Accounting Education*, *22*, 59–76.

Thompson, B. (1993). The use of statistical significance tests in research: Bootstrap and other methods. *Journal of Experimental Education*, *61*, 361–377.

Simon, H. A. (1980). The behavioral and social sciences. *Sciences*, July, pp. 72–78.

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Non-empirical manuscripts should be academically rigorous. They can be theoretical syntheses, conceptual models, position papers, discussions of methodology, comprehensive literature reviews grounded in theory, or historical discussions with implications for current and future efforts. Reasonable assumptions and logical development are essential. All manuscripts should discuss implications for research and/or teaching.

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INCREASING THE COMPETENCY FOCUS USING A PROJECT-DRIVEN STRATEGY

Michele Matherly and Laurie L. Burney

ABSTRACT

Accounting educators continue to look for efficient ways to introduce personal competencies into the curriculum. Prior literature contains numerous suggestions on how faculty can implement a single personal competency, such as written communication. This chapter describes our strategy for integrating a variety of personal competencies using team projects. We implement this strategy by selecting projects that are content oriented and not only involve critical thinking but also address students' skills related to written and oral communication, technology, teamwork, and leadership. We offer guidance on how to implement this project-oriented strategy and also provide selected tools for streamlining the assessment of student performance, such as sample grading rubrics and an online survey for evaluating team leader and team member performance. Feedback suggests that students perceived an improvement in their competencies as a result of the course's activities. While we bundled a variety of personal competencies within a managerial cost accounting

course, instructors can easily adapt our strategy to any course in the curriculum.

Today's accounting graduates enter a profession that expects them to possess not only traditional technical knowledge but also soft skills. Nevertheless, Kavanagh and Drennan (2008, p. 279) note that, "Both students and employers report that many of the 'essential' non-technical and professional skills and attributes are not being developed sufficiently in university accounting programmes." The authors conclude that educators need to place more emphasis on developing competencies if accounting graduates are to be competitive in the global business world (Kavanagh & Drennan, 2008). While several accounting educators have shared information about their approaches to delivering and assessing these competencies (e.g., Feldmann, Koulish, Osterheld, & Thibodeau, 2007; Daigle, Hayes, & Hughes, 2007; Weil, Oyelere, & Rainsbury, 2004), most accounting articles describe activities that address the various competencies in isolation. In contrast, this chapter describes a strategy for bundling multiple personal competencies into content-relevant team projects.

The calls for change, both from academics and practitioners, generally agree that enhancing student competencies is essential to prepare students for successful accounting careers (Kavanagh & Drennan, 2008; Siegel, 2000). While addressing competencies in an accounting course is not unique in itself (e.g., Ashbaugh, Johnstone, & Warfield, 2002; English, Luckett, & Mladenovic, 2004), our strategy is innovative in several ways. First, we integrate a variety of personal competencies into content- and critical thinking-oriented course activities. Second, in addressing the set of competencies, we include repetition, which Ashbaugh et al. (2002) recommended to affect improvement in competencies such as writing. Third, the teamwork activities place an explicit emphasis on the development of leadership skills. Fourth, we introduce creativity to generate useful course feedback. Finally, we develop an array of assessment tools that streamline the grading process. Even though we implemented our project-driven strategy in a junior-level managerial cost accounting course, instructors can easily adapt it to fit any accounting class.

Our chapter contains the following sections. First, we discuss the purpose of the chapter in light of the call for change within the accounting profession and the assessment requirements of the AACSB. Next, we describe the educational objectives of our chapter and provide implementation guidance. Then, we offer insight into the impact of our project-driven strategy by

providing student feedback. We conclude with a discussion of the lessons we learned while implementing this strategy. Finally, in the appendices we present specific details of how we implemented our strategy through our three project framework.

PURPOSE

Since the 1950s, the accounting profession has voiced a need for change in accounting education. The calls to improve the competencies of entry-level accountants intensified during the 1990s after publication of *Perspectives on Education: Capabilities for Success in the Accounting Profession* (a.k.a. Big 8 White Paper) (Kullberg et al., 1989) and formation of the Accounting Education Change Commission. Since that time, the American Institute of Certified Public Accountants (AICPA), the Institute of Management Accountants (IMA), the Institute of Internal Auditors, and the International Federation of Accountants have released studies suggesting similar changes in accounting education (see Palmer, Ziegenfuss, & Pinsker, 2004, for a thorough review).

These studies identify several competencies that are important for entry-level accountants. The list of competencies consistently includes, among others, communication skills, interpersonal skills, computer skills, and leadership. As noted by Palmer et al. (2004, p. 895), "The trend appears to indicate that some skills are becoming more important than some of the accounting knowledge normally included in accounting curriculum." Additionally, given that the calls for change are from diverse segments of the accounting profession, an increased emphasis on competencies should provide higher value to students and their future employers, regardless of the career path that students select.

In 2003, the AACSB revised its accreditation requirements with the most significant change being the inclusion of assurance of learning standards (Martell, 2007). The increased accountability that these assessment standards levy on colleges of business has focused attention on the development of student competencies. Colleges of business can use several techniques to "close the loop" between student abilities and program expectations, and these improvement strategies are an integral aspect of AACSB accreditation (Martell, 2007). Consequently, interest in proven methods of addressing these competencies and how to assess students' abilities is increasing. However, criticisms continue that educators are not

sufficiently incorporating competencies in their curricula (AACSB, 2002; Tatikonda, 2004; Broome & Morris, 2005).

The impetus for change has garnered much interest from accounting educators, which has translated into articles that report on approaches developed to address these competencies. In recent years, several of these studies concentrate on one competency in isolation, such as writing (Matherly & Burney, 2009; Cleaveland & Larkins, 2004; Reinstein & Houston, 2004), groups (Ballantine & McCourt Larres, 2007), leadership (Burney & Matherly, 2008), technology (Gujarathi, 2005; Heath, 2008), and a cross-functional view of business (Ammons & Mills, 2005). Even the AICPA's Education Competency Assessment website (www.aicpa-eca.org) provides guidance on education strategies separated by the specific competency. Rather than focusing on one competency, other studies have taken a broader approach by addressing multiple competencies in a single project (Roxas, Peek, & Peek, 1998), by examining the AICPA's core competencies framework within classes (Daigle et al., 2007), and through different pedagogical methods (Weil et al., 2004; Tschopp, 2004). Yet, the availability of studies that integrate several competencies through a series of activities is limited. Consequently, our chapter addresses this gap in the literature by describing a strategy that uses projects to target not only content and critical thinking but also multiple personal competencies that are enhanced through repetition.

EDUCATIONAL OBJECTIVES

While we could have used any accounting course to enhance personal competencies, we chose the junior-level managerial cost accounting course for several reasons. First, this course allows us to direct our efforts toward accounting majors, as opposed to a principles-level course taught primarily to non-majors. Second, students take this course early in their accounting program, thereby allowing them to apply their competency skills in future classes. Finally, our junior-level managerial cost accounting course involves a great deal of ambiguity and decision making. After reviewing the competencies outlined in the various calls for change, we discussed the course change with management accounting practitioners at the IMA's Annual International Conference as part of an Academic Roundtable. The practitioners provided recommendations for course content and competency coverage. From this information, we selected the following competencies to emphasize in our course: teamwork, leadership, oral and written communication, and technology.

Table 1. Summary of Competencies Across Course Projects and
Supplementary Activities.

	Leadership	Teamwork	Communication		Technology	Percent of Course Grade	Appendix Coverage
			Oral	Written			
Project 1	X	X		X	X	4	B
Project 2	X	X		X	X	4	C
Project 3	X	X	X	X	X	4	D
Leadership component of project grade						3	A
Teamwork component of project grade						6	A
Excel Homework					X	7	C
Individual Presentations			X			2	D
Total						30	

We revised the course by adopting a strategy that integrates competencies through team projects. As shown in Table 1, integration allows us to address multiple competencies through a limited number of assignments. Without integration, we would consume valuable class time addressing each competency, which limits the opportunity for repetition. To address multiple competencies and achieve repetition, we selected the assignments listed in Table 1. Overall, these assignments account for 30% of the course grade.

The personal competencies of teamwork and leadership are an integral part of the team projects. We intentionally try to create "teams" rather than "groups." One weakness of traditional group projects is that students often take turns individually completing the entire project on behalf of the group. Alternatively, they may split the work among the members with the end result being the sum of the parts. In contrast to these group strategies, "teams" develop trust and mutual accountability (Bryant & Albring, 2006). To encourage team formation, we select projects that are extensive and time consuming, thereby making it very difficult for one person to complete within the given timeframe. The projects also involve ambiguity, which requires decisions by the members to develop a cohesive final product. In addition, we choose projects where the components are interdependent to promote mutual accountability. Consequently, we create an environment

designed to require participation by all team members and encourage students to function as a team rather than as a group. The complexity of these projects also provides an opportunity where leadership can enhance the productivity and output of the team. Appendix A gives a detailed overview of the teamwork and leadership handouts and assessments.

For Project 1, we chose an IMA case that requires each team to answer questions discussing how activity-based costing (ABC) differs from traditional product costing, to evaluate cost drivers and determine activity levels, and to draft a memo that critiques the existing ABC system. While the project emphasizes the critical thinking and content inherent in ABC calculations, it also targets the competencies of written communication, technology, teamwork, and leadership. Appendix B provides a more thorough description of how we used Project 1 to implement our strategy.

We selected a comprehensive case for Project 2 where teams use Excel to prepare an extensive budget analysis. By varying case facts based on the leader's student number, we generate a unique final solution for each team. The case involves ambiguity, and the teams must note any assumptions they make to complete the project. As part of the budgeting process, each team also uses Excel to perform regression analyses. This aspect of the project requires the team to generate various models, choose the ''best'' model, and write a memo to justify the one used in their budget projections. With respect to competencies, this project addresses the students' cost accounting knowledge and critical thinking, and the personal competencies of technology, written communication, teamwork, and leadership. Appendix C provides more specific information about how we executed our competency-oriented strategy using Project 2, as well as the Excel homework that serves as a foundation for this project.

We designed Project 3 to give students the opportunity to make suggestions for future course improvements. These suggestions range from creating new assignments for the course to helpful handouts to assist students in areas where they currently struggle. Besides our competency objectives, two additional goals of this activity are to stretch the students' creativity and for us to gain insight regarding constructive suggestions for improving the course. At the conclusion of all presentations, we gather feedback from students about which ideas we should consider implementing in future course offerings. Overall, this project emphasizes critical thinking and addresses the personal competencies of oral communication, written communication, technology, teamwork, and leadership. Appendix D contains more detail about how we used Project 3 to achieve our strategy for incorporating multiple competencies. This appendix also includes the

project handout distributed to students, as well as a discussion of the individual presentations that prepare students for this project.

IMPLEMENTATION GUIDANCE

To build commitment and synergies among the members as recommended by Bryant and Albring (2006), our student teams work together for an entire semester. In addition, our projects promote team building in that they create accountability among the members and reliance on the differing talents and abilities of the members (Bryant & Albring, 2006). We randomly choose students for each team in an attempt to promote diversity of student skills across teams. Assignment of team members, as opposed to student formed groups, also relates more to real-world work experiences where workers rarely select their own team members (Ballantine & McCourt Larres, 2007). With random assignment, we are less likely to have all ''A'' students on the same team. Thus, teams are similar based on overall ability, and the better students are available to help those who are struggling with the material.

We jointly teach the course using coordinated syllabi and class schedules for all sections of the managerial cost accounting course. In the course schedule, we distribute project due dates evenly throughout the semester to enable feedback on each project before the next one begins. We typically form teams and discuss in class the Agenda for Team Projects handout during the second week of the semester. Teams must decide the order in which the members will serve as the group leader and e-mail a list to their instructor. For each project, we allow a week for the team leader to submit an agenda and an additional three weeks for the team to complete the project. Consequently, each project takes about a month to complete.

We schedule the projects with a one-week break between them to allow time for grading and providing student feedback. To speed grading decisions and promote consistency across teams, we assess projects using detailed rubrics. The appendices offer additional information about the grading rubrics, which allocate points for the correctness of the solution, use of specified Excel functions, quality of the writing and oral presentation (when applicable), professional appearance of the solution, and compliance with the instructions.

At the conclusion of each team project, students individually complete an online evaluation (see Appendix A). The survey asks students to assess their team members' performance, indicating each member's relative contribution, attendance at meetings, quality of work and attitude, and the leader's

performance, through questions about his/her organization and ability to encourage the members' openness to the ideas of others, etc. The survey also includes space for students to provide additional comments to their professor. These comments are confidential but give insight into team dynamics. These survey results serve as the basis for the team evaluation grade and are the primary component of the leadership grade.

Collecting the evaluations via online survey software serves several purposes. Most importantly, we want students to feel comfortable giving us honest feedback, which they may not be able to do when completing the survey sitting next to their peers in class. The students' comments are very candid and students differentiate between team member contributions in their grading. Therefore, we believe that the process gives students a ''voice'' regarding the team's functioning and encourages critical thinking skills. Further, by using survey software, we capture the responses in an Excel file that facilitates the data accumulation and analysis needed for grading.

STUDENT FEEDBACK

At the end of the semester, we surveyed students to evaluate the impact of our project-driven strategy for integrating competencies. A colleague administered the survey near the end of the semester and held the responses until after we submitted final course grades. We collected the data in this fashion to promote student participation and honesty in responses. The survey consists of items that measure students' perceptions of their abilities associated with the various competency objectives of the course. While concerns may be raised about students' self-report of their learning, prior literature generally supports the validity and reliability of student responses when asked to assess their learning and whether assignments enhance their understanding (Green & Calderon, 2005).

Table 2 provides demographic descriptions for our 109 student respondents. The respondents included students from all sections offered during one semester, two day and one night, and were relatively equally divided between day and night. One instructor taught the two day classes, and the other taught the night section. Our respondents were mostly female (61.3%), with an average age of 25.13 years. In addition, 77.5% of the respondents work an average 26.5 hours per week. Even with this work commitment, our respondents reported taking a full class load of 12.37 credit hours, on average.

Table 2. Descriptive Demographic Information ($n = 109$).

Gender	Female	61.3%
Age (average)		25.13
Is English your second language?	Yes	21.1%
Are you currently employed?	Yes	77.5%
If so, how many hours per week? (average)		26.50
Cumulative GPA (average)		3.18
Accounting GPA (average)		3.25
Expected grade in the course	A	2.8%
	B	25.0%
	C	53.7%
	D	18.5%
Number of credit hours you are taking this semester (average)		12.37

We used the survey to obtain feedback from students regarding their perceptions of the effect of our project-driven strategy. In particular, we asked students to indicate the extent to which they agree that our course directly improved their competency in each of the noted areas. Students responded to these questions using a seven-point scale where 1 = strongly disagree, 4 = neutral, and 7 = strongly agree. Accordingly, higher values represent higher perceived levels of improvement in their competencies. Table 3 presents for each competency listed the relative frequencies in Panel A and means in Panel B. We compared the means on the relevant competencies and found no significant differences between instructors. Interestingly, students indicate improvement (means are significantly greater than the scale's midpoint of four) in all the listed competencies except for technology – database. This result serves as a validity check on student responses, as we did not specifically concentrate on developing database skills. Thus, as would be expected, the mean for this item is less than the midpoint of four, with 57.8% of the students rating improvement in this competency as a four or less. The items students rated as having the greatest impact were course content (mean = 5.82, 88.1% with a rating ≥ 5), technology – spreadsheets (mean = 5.55, 84.4% with a rating ≥ 5), team interaction (mean = 5.41, 82.6% with a rating ≥ 5), and analytical/critical thinking (mean = 5.47, 80.7% with a rating ≥ 5). Overall, these results indicate that students perceived that our project-driven strategy had a positive impact on their knowledge and competencies.

On the basis of anecdotal student comments, we also discovered an additional benefit from our strategy. According to our students, their course experiences give them specific examples to discuss during behavioral job

Table 3. Student Perceived Course-Related Improvements[a].

	Relative Frequency of Responses ($n = 109$) (%)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Frequencies							
Cost accounting content	0.9	1.8	9.2	18.3	42.2	42.2	27.5
Technology – spreadsheet	0.9	1.8	3.7	9.2	22.9	42.2	19.3
Technology – databases	17.4	7.3	9.2	23.9	24.8	13.8	3.7
Analytical/critical thinking	0.0	0.9	1.8	16.5	24.8	42.2	13.8
Link to other business disciplines	0.0	1.9	4.6	14.8	38.9	32.4	7.4
Oral communication	0.9	2.8	9.2	30.3	35.8	16.5	4.6
Written communication	0.0	1.8	13.8	26.6	34.9	22.0	0.9
Team interaction	1.8	1.8	2.8	11.0	28.4	37.6	16.5
Leadership	0.0	0.9	3.7	16.5	38.5	30.3	10.1
Panel B: Means							
Cost accounting content							5.82[b]
Technology – spreadsheet							5.55[b]
Technology – databases							3.87
Analytical/Critical thinking							5.47[b]
Link to other business disciplines							5.18[b]
Oral communication							4.65[b]
Written communication							4.64[b]
Team interaction							5.41[b]
Leadership							5.24[b]

[a]Survey question: "Using the 7-point scale, indicate the extent to which you *agree* that *this course* (ACCT XXXX) has directly *improved* your competency in each of the following areas:" Where: 1 = strong disagree, 4 = neutral, 7 = strong agree.
[b]These ratings are significantly different from the midpoint rating of 4.0 ($p < 0.00$) using a one-sample t-test.

interviews. In particular, students say they base several answers on their teamwork and leadership competency activities from this course. Therefore, the class activities serve as practical applications of work situations and provide concrete examples for interviewing.

CONCLUSION

The project-driven strategy described in this chapter integrates personal competencies that many have argued are necessary for successful accounting careers. This approach allows us to bundle competencies and incorporate

repetition into projects that develop course content and critical thinking abilities. While we adopted this strategy in a managerial cost accounting setting, it has the potential to enhance student learning across the curriculum.

We have learned several lessons to help faculty streamline the implementation of our project-driven strategy. We begin by highlighting a few things that worked especially well. First, the use of rubrics facilitates the grading process. Second, collecting survey responses for team and leader evaluations via Internet survey software allows us to gather and analyze the data in a way that reduces the faculty time commitment related to assessment. Third, the leadership component was easy to implement and efficient in providing an experience in which students engaged in a true leadership role. Finally, the third team project, which relied on students' creativity, gives unique feedback for future course development.

We also learned several lessons that may improve the process. First, we rely on detailed rubrics to speed the grading process. Given our desire to protect the level of ambiguity in the projects, we do not share these rubrics with students, as we already provide sufficient detail on the project requirements. However, students might benefit from the distribution of revised rubrics that would give them additional guidance in completing the projects, yet protect the aspects of the course that involve decision making with ambiguity.

Second, we discovered that completely renovating a course is an ambitious undertaking. Even though we worked as a team, creating the materials and grading rubrics for such a wide variety of activities involves significant startup time. Based on our experience, we recommend instructors build upon our efforts and start with a few activities that address multiple competencies. However, if all new activities are created, we suggest expanding the development period by integrating the changes over time rather than all at once. The repetition that helps reinforce the competencies can be built into the course by adding projects over a number of semesters.

Third, we believe that many benefits would accrue if accounting faculty embrace a curriculum-wide approach to personal competency development. In this environment, instructors will communicate the importance of soft skills to students throughout their coursework. An additional positive of curriculum-wide adoption results from standardizing grading rubrics, writing expectations, and presentation formats. This approach minimizes the instructor's time commitment for developing these materials and allows students to practice their competency skills in a variety of settings with

consistent feedback. Also, standardized guidelines and rubrics provide a common method of evaluating student competencies, thus establishing a framework for complying with the AACSB's guidelines focusing on assessment.

The calls for change in accounting education and the AACSB's assurance of learning requirements are the impetus for accounting educators to address competencies throughout students' courses. The project-driven strategy described in this chapter demonstrates how faculty can integrate multiple personal competencies into a series of projects that also stress course content and critical thinking.

ACKNOWLEDGMENTS

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APPENDIX A. TEAMWORK AND LEADERSHIP

Calls for change in accounting education consistently note the importance of students having the ability to work in a team environment and developing leadership skills (Palmer et al., 2004; Kavanagh & Drennan, 2008). We recognized during the course design process that team-oriented activities provide an efficient way to integrate a variety of competencies. We also felt that adding a leadership experience would be a natural extension of the projects. Thus, the personal competencies of teamwork and leadership are an integral part of all the projects.

While literature often uses the terms "teams" and "groups" interchangeably, there is a difference. Groups are likely to subdivide a project and submit a solution that is the sum of the individual's contributions (Bryant & Albring, 2006). Alternatively, when there are several projects, students may decide to take turns individually completing a project on behalf of the group. Teams, on the other hand, develop trust and mutual accountability among the members (Bryant & Albring, 2006). We encourage team formation through our project selection. For instance, we use projects that involve ambiguity that calls for team decision making to achieve consistency across the project elements. Also, we select fairly complex projects that cannot easily be completed by a single individual. Finally, the elements in our projects are interdependent, which should foster the trust and mutual accountability associated with teams. Hence, we intentionally create an environment that encourages formation of teams rather than groups.

We randomly assign three students to each team so that every student serves as the team leader for a project. Small teams also limit the potential for a free-rider problem. Furthermore, general agreement exists that a team of three or four is ideal to capture the benefits of differing opinions and experiences, as well as styles of learning (Ballantine & McCourt Larres, 2007). Random assignment creates diversity within the teams and means that students are unlikely to be working with their typical group partners. This resulting diversity, such as backgrounds, aptitudes, and schedules, also encourages students to employ their leadership and team-building skills.

We clarify our expectations for the teamwork and leadership competencies by providing the Agenda for Team Projects handout shown in this appendix. This handout, which is consistent with the guidelines of Lumsden and Lumsden (1997), describes the responsibilities of the team leader and the individual team members. On the day we make team assignments and distribute the Agenda for Team Projects handout, we spend class time differentiating between the way that a group approaches a project versus the way a team should. We also have students gather in their teams and ask the team members to exchange contact information and spend a few minutes getting acquainted.

Each student serves as his/her team's leader on one project. The leader, with the input from team members, establishes the plan for completing the project, assigns responsibilities, and coordinates team activities for the project. Shortly after a project is distributed, the leader submits a formal agenda that reflects the team's plans for completing the assignment. The agenda identifies the team member responsible for each step and sets interim deadlines to ensure that all parts of the project are completed in the sequence necessary for meeting the due date. In addition, the leader coordinates the team's activities and meetings and tries to motivate every member to stay involved and on schedule.

As noted in Table 1, students receive separate grades for their leadership and teamwork activities. The leadership grade consists of two parts. First, each leader receives a grade based on the agenda equal to 1% of the course grade. Specifically, we evaluate the agenda on whether it details the relevant steps, identifies proper order for the steps, assigns the steps to specific team members, is professionally presented, and complies with basic grammar and minimum writing rules. Failure to assign specific team member responsibilities leads to a significant grade deduction. Second, each team member evaluates the leader's performance as part of an online survey, which accounts for 2% of the course grade. As seen in the survey included at the end of this appendix, the team members use a five-point scale

(where $1 = $ poor and $5 = $ excellent) to assess the leader's organizational skills, willingness to solicit member input, ability to motivate member participation and obtain their best efforts, and success at coordinating the team's activities to meet its deadlines. Team members use this same scale to rate the leader's overall performance.

The teamwork grade is also a function of the online survey. After each project, students receive a score worth 2% of the course grade based on their team members' evaluation of their performance. The survey asks students to consider each team member's relative contribution, attendance at meetings, quality of work, and attitude. The survey also allows students to provide additional comments, which give the instructor insight into the dynamics of their team. Collecting the survey data online enables us to download it in an Excel file and easily convert the results into teamwork scores and a leader score.

AGENDA FOR TEAM PROJECTS

The agenda assignment gives each student an opportunity to document a team's complex plans for a project. This assignment also provides each team member with an opportunity to practice sticking with a plan. This handout describes both the team leader and team members' responsibilities related to the team projects.

An agenda formalizes the activities that need to take place during the time allotted to complete a project (Roebuck, 1998). In addition, the agenda serves as a personal planning aid and a means of communication with other team members.

The agenda, which *only the team leader* will submit, must include the following information:

1. The steps necessary to complete the project
2. The sequence and planned completion date for each step in part (1)
3. The name of the team member(s) responsible for completing each step.

Since each team will complete three team projects this semester, each team member will take a turn as leader. For teams with only two members, the members will share the duties of the leader for the third project. Teams will decide the order in which members serve as leader. Send your instructor an e-mail listing the leader for Project 1, Project 2, and Project 3.

The leader is responsible for coordinating the team's activities and decisions on the project. Also, the leader should ensure that all members have the opportunity to learn, participate, and earn the respect of their teammates. Once the team has planned the project, the leader will formalize the team's discussion in a planning document – the agenda. Using the agenda, the leader should monitor team members' progress in completing each step in a timely manner.

Some items to consider in the agenda are as follows:

*   What are the various parts of the project?
*   Who will be responsible for drafting each part?
*   Who will put the different parts together?
*   Who will edit the project's report?
*   In what order should the various activities be completed?
*   Are some activities dependent on work done at other stages?
*   When do the various parts need to be completed to allow for editing prior to the due date?

The other team members are responsible for participating in the development of the project, reviewing the agenda prior to submission, completing their assigned portion of the project by the due date, and supporting the efforts of the team and its leader. After the team completes the project, team members will evaluate how well the agenda worked (or didn't work).

Right of Eviction: To address potential free-rider problems, teams will be allowed to exercise a right of eviction. If a team member is not contributing equally to the team projects, the other members should notify that individual via e-mail, with the instructor also receiving the e-mail notification. This first notice must be sent at least *one* week prior to the project's due date. If the individual does not become an equally participating team member, the other members can evict that individual. If the team decides to take this action, the individual must be notified via e-mail at least 48 h prior to the project due date (again copy your instructor in the e-mail). If this eviction occurs, the evicted individual will be required to complete the entire project alone (not join another team) and submit the project on the original due date.

ONLINE SURVEY OF TEAM MEMBER
AND LEADER PERFORMANCE

All Team Members

Your evaluations of the team's participation and the leader's effectiveness are important aspects of the projects for this class. Consequently, if you fail to submit your evaluations by the due date, you will receive a grade of zero (0) for the team evaluation component of your grade for this project.

Please list all of your team members:

Yourself   [_____]

Member A   [_____]

Member B   [_____]

Please complete the following two steps for your first team project.

<u>Step 1 – Team Evaluation</u>

G1. How often did each team member attend team meetings outside of class?

	Half	2	Most	4	Always
Yourself	○	○	○	○	○
Member A	○	○	○	○	○
Member B	○	○	○	○	○

G2. How often did each member of the team do his/her full fair share of the work?

	Never	2	Half	4	Always
Yourself	○	○	○	○	○
Member A	○	○	○	○	○
Member B	○	○	○	○	○

G3. What was the quality of the work typically contributed by each team member?

	Poor	2	Fair	4	Excellent
Yourself	○	○	○	○	○
Member A	○	○	○	○	○
Member B	○	○	○	○	○

G4. To what extent did each team member demonstrate a positive, willing, cooperative attitude?

	None	2	Some	4	Always
Yourself	○	○	○	○	○
Member A	○	○	○	○	○
Member B	○	○	○	○	○

G5. Suppose you were given $100 to pay team members for their efforts in completing this first team project. Think back over the past few weeks and consider what each person – including yourself – contributed to the team's efforts. Now, please divide the $100 among the team members in a way that reflects how you view each member's relative contribution. Check to make sure that these amounts sum to $100. Fill in each team member's name and amount below. You may write a brief comment about the member's contribution if you wish. (Note: Your message will be read by only your professor.)

Yourself _____

Member A _____

Member B _____

G6. Additional comments:

Step 2 – Leader Evaluation

L1. Leader evaluation

Leader's Name _____

L2. Did you receive a copy of the agenda?

☐ Yes

☐ No

L3. Evaluate the team leader's performance by responding to the following questions. Use five-point scale to indicate your response.

	Poor	2	Satisfactory	4	Excellent
How well did the leader organize your team's efforts on this project?	○	○	○	○	○
How well did the leader solicit input and ideas from ALL team members?	○	○	○	○	○
How well did the leader ensure that all members of the team had an opportunity to participate?	○	○	○	○	○
How well did the leader coordinate the team's activities and help the team meet its deadlines?	○	○	○	○	○
How well did the leader get the best that each team member could contribute to this project?	○	○	○	○	○
How well did the leader ensure that all members of the team were treated with respect by their team members?	○	○	○	○	○
Overall, how do you rate the leader's performance?	○	○	○	○	○

Submit Survey

APPENDIX B. PROJECT 1

In addition to content and critical thinking skills, Project 1 stresses written communication skills, while also integrating teamwork, leadership, and technology. In a recent survey by Blanthorne, Bhamornsiri, and Guinn (2005), newly promoted partners at Big 5 firms (the number of large firms at the time) rated communication as equally important as or slightly more important than technical skills at all promotion levels. According to Nellermoe, Weirich, and Reinstein (1999), practicing accountants report spending as much as 30% of their time engaged in writing activities. Thus, to become successful professionals, accounting students must be able to write effectively.

While many good cases are available, we use one published by the IMA and supplement it with questions provided in Eldenburg and Wolcott (2005). We chose a case that covers the appropriate content, involves substantial application of the concepts, as well as some ambiguity or uncertainty. To incorporate the written communication competency, the selected case emphasizes interpretation of results over the analysis itself. While students must make activity-based costing (ABC) computations, the case focuses more on critical thinking and written communication. More specifically, questions guide the teams through a process that begins by asking them to differentiate ABC from traditional costing systems, and continues with a detailed critique of the organization's current ABC system. After answering these questions, teams prepare a memo to the controller summarizing their critique and suggesting improvements to the product costing system.

We provide students with a handout of minimum writing rules that identifies common mistakes made by business writers. We developed this handout based on our prior experiences with student writing efforts. Specifically, we stress issues such as writing concisely and using active voice. We also point out common writing mistakes, such as referring to a company as "they" rather than "it" and using improper homophones (e.g., there versus their). A review of recent practitioner literature reveals several articles highlighting similar writing issues (Lynch & Golen, 2003; Shanker, 2006; Casagrande, 2007).

The grading elements for Project 1 are the solution's correctness (60%), writing (20%), technology (10%), and compliance with stated requirements (10%). The content grading rubric we use for this project appears at the end of this appendix. For the writing grade, we consider the written responses in light of the specified minimum writing rules, which act as a benchmark. The technology aspect of the project involves using Excel to prepare the ABC analysis and revised financial projections. When assessing compliance, we check to see that the final product adheres to the project guidelines regarding length, font size, margins, as well as using separate pages for the analysis and memo.

GRADING RUBRIC FOR PROJECT 1

	Points

A. Calculation consistent with IMA solution 10
    2 pts – Documentation   1 pt – Excel documentation
    2 pts – Merchandise   1 pt – Professional presentation
    3 pts – Selling and administrative costs   1 pt – Other

B. Identify relevant cost objects 10
    Grade =   10 if good alternative with examples, cost benefit test
              8 if good alternative with examples, but no justification
              7 if good alternative without examples or justification
              5 if clear about cost object definition
              4 if answers are complete but incorrect

C. 1. Traditional is financial statement oriented, ABC is activity oriented 4
    Grade =   4 if differentiate between traditional and ABC
              3 if close but not complete
              2 if attempted but incorrect

    2. Potential reasons 6
    Grade =   6 if two valid reason
              4 if one valid reason out of two given
              3 if one valid reason without another given or two invalid given
              2 – minimum score

D. 1. Pick/Pack/Shipping 5
    Grade =   5 if select one of two valid alternatives with stated preference for one
                with good justification
              4 if select one and justify
              2 – minimum score

    2. Selling and administrative expenses 5
    Grade =   5 if determine not a homogeneous cost pool and examples of
                different costs/ pools/drivers
              4 if determine not a homogeneous cost pool but don't fully explain
              3 if pick one cost driver and justify
              2 – minimum score

E. 1. Pick/Pack/Shipping 5
    Grade =   5 if identify current cost driver, state an opinion, justify
              4 if identify current cost driver, state an opinion, weak justification
              3 if identify current cost driver, state an opinion, no justification
              2 – minimum score

    2. Selling and administrative expenses 5
    Grade =   5 if identify current cost driver, state an opinion, justify
              4 if identify current cost driver, state an opinion, weak justification
              3 if identify current cost driver, state an opinion, no justification
              2 – minimum score

F. Memorandum 10
    Grade =   10 if summary sufficient with no errors in details
              8 if summary close but one misstatement or error
              6 if summary contains more than one misstatement or error
              4 – minimum score

APPENDIX C. PROJECT 2

Project 2 emphasizes the technology competency, while also integrating written communication, teamwork, and leadership into a project requiring content knowledge and critical thinking. The technology aspect of this project concentrates on improving students' Excel competency. We expect students to use Excel as an analysis tool, not a typing tool. Spreadsheet design is especially critical for cost accounting applications, which frequently involve changing estimates to perform sensitivity analyses. We require spreadsheets to have a data section to summarize all the given facts and a separate analysis section that contains almost exclusively of formulas that cell reference the data section. With all amounts originating in a distinct location, students can update the entire spreadsheet by simply modifying values in the data section. From a grading perspective, this spreadsheet design allows the instructor to change a fact in the data section and quickly determine if the formulas produce a correct revised solution.

We also expect spreadsheets to contain adequate documentation. We stress that numbers should not magically appear in a spreadsheet; thus, students must label every number. Another aspect of documentation is learning to provide sufficient detail for an informed user to follow the analysis. For example, an income statement that shows how students derived net income is easier to follow than a formula computing net income in a single cell. One of the challenging aspects teams face in completing Project 2 is ensuring that students consider all of the relevant facts and appropriately document them. Consequently, we do not provide a template for the project, because it would reduce the project's complexity by identifying which items to include in each budget. Without a template, teams must determine how to adequately document their analysis. Nevertheless, instructors who want to streamline the grading process may want to distribute an Excel master budget template to the teams.

In Project 2, teams use Excel to prepare a full set of quarterly budgets and pro forma annual financial statements for a manufacturer. The base information starts with a master budgeting problem from our textbook. We expand the details in the project and introduce additional complexities, such as two raw materials, a minimum cash balance requirement, and a line of credit with draws and repayments in $1,000 increments. The project requires specific Excel functions and features, such as IF statements, Name Ranges, Grouping, Rounding, and Conditional Formatting.

We add further difficulty to the project by embedding cost estimation in the overhead budget. We provide historical data for a mixed cost overhead

item, such as maintenance, and introduce ambiguity by including multiple potential cost drivers to consider in the related regression analyses. As a result, teams must evaluate both simple and multiple regression models. Each team selects its "best" model and writes a brief memo describing the different models considered and justifying the one selected. The memo must note any assumptions the team makes while completing the assignment. This aspect of Project 2 requires critical thinking and integrates the written communication competency into a technology-centered project.

With Project 2, we create unique solutions for each team by using the leader's student number as part of the data. For example, fourth quarter estimated sales might be 28^*,000 units, where * is the fourth digit of the student number. Similarly, we vary the direct labor hourly wage, as well as the interest rate on short-term borrowing, based on different student number digits. To grade Project 2, we enter the leader's student number in the data section of our solution file and Excel automatically updates the results in the analysis section that cell reference the relevant digits. Thus, we easily create an Excel key that produces a different solution for each team based on the leader's student number.

When grading Project 2, we assign half of the grade to content and distribute the remainder across the following criteria: writing (10%), compliance (20%), Excel functions (10%), and professional appearance and documentation (10%). We base the content grade on the correctness of specific values as detailed in the grading rubric shown at the end of this appendix. We review the memo for reasonableness of the argument supporting the regression model selected. In addition, the memo must comply with our minimum writing rules (see Appendix B). The compliance element considers whether teams follow the guidelines for preparing the Excel solution. The grading rubric provides more detail on the compliance grade, along with the Excel functions included in the project, and the criteria used to assess professional appearance and documentation. As part of the documentation grade, instructors can easily check each file for minimal typing by simultaneously pressing Control and ` keys. This key combination toggles between showing the cell's results and the cell contents (i.e., formulas).

Excel foundation: Students enter our course after completing a sopho-more-level course that delivers a basic introduction to Excel. Early in the semester, students begin preparing for Project 2 by individually completing Excel homework problems. These assignments help students acquire a common set of skills and understand our expectations regarding Excel. In all, students complete seven individual Excel assignments each worth 1% of the course grade. When possible, the homework assignments expose students to

Excel capabilities that are relevant to cost accounting but may be overlooked in an AIS course. Examples include using Solver for optimization problems for the theory of constraints, Charts for breakeven analysis, and the Analysis Toolpak for cost estimation involving regression and other statistical analyses. We evaluate the individual assignments by balancing computational correctness with technology issues. Hence, our grading rubrics distribute about half of the points to the correctness of the calculations and the remainder to spreadsheet design and adequate documentation (i.e., use of a data section and analysis section, cell referencing, formulas, etc.), adherence to assignment requirements, and professional appearance. These rubrics list the assignment characteristics and students receive a zero or one grade for each item. Thus, the objectivity of these grading rubrics speeds the grading process, much the same as the rubric for Project 2.

GRADING RUBRIC FOR PROJECT 2

Class Section _____
Team # _____

Content Grading Checklist		Compliance Checklist	
Sales Budget		E-mail subject correct	
Production Budget		Excel and Word file names correct	
Direct Materials Budget		Worksheets properly named	
Direct Labor Budget		Printed version in order	
Overhead Budget		Opens to the summary sheet	
Selling and Admin. Expense Budget		Summary sheet proper information	
Cash Budget		Order of worksheets in Excel file	
Schedule of Budgeted Ending DM Inv.		Budgets 1–7 qtr and annual column	
Schedule of Budgeted COGM		Operational Budgets worksheet includes 1–7	
Schedule of Budgeted Ending FG Inv.		Cash Budget on separate sheet	
Schedule of Budgeted COGS		Budgets 8–14 include only annual column	

Budgeted Income Statement		Financial Statements worksheet includes 8–14	
Budgeted Stmt of Retained Earnings		Memo – 250 word maximum	
Budgeted Balance Sheet		Memo – double spaced	
Regression		Separate worksheet for data section	
Memo content		**Excel Functions**	
Professional Appearance and Documentation Checklist		Name Range – sales in units	
Page breaks appropriate		If Statement – cash borrowing	
Accounting single/double in financial statements and related schedules		Name Range – YTD sum	
Borders single/double in all other worksheets		Absolute copying – overhead budget	
No typing of numbers in analysis section		Grouping – operations budget	
Documentation/Formatting		Conditional format – cash balance	
		Round – maintenance costs	

APPENDIX D. PROJECT 3

Along with content and critical thinking, Project 3 focuses on oral communication skills, while integrating the personal competencies of technology, teamwork, and leadership. As accountants, we are expected to have technical expertise and be able to communicate our findings. Nevertheless, undergraduate accounting students spend most of their time mastering technical content, with little opportunity to develop their oral communication skills. With Project 3, team members implement guidance on how to be an effective presenter.

For Project 3, each team identifies and presents an idea or suggestion to improve the course for future semesters. Every team member must equally participate in the presentation, thereby ensuring that all students address the oral communication competency. We help students prepare for the presentations by distributing a handout describing tips for effective presentations. The handout identifies positive behaviors, such as maintaining eye contact with the audience, as well as distracting behaviors, such as reading

from cards or slides. We hope that presenting their own ideas will help students relax more when compared to situations where the content requires a "correct" solution, such as with cases or term papers. We also believe that this project simulates real world situations where the presenters are more familiar with their material than anyone in the audience. From a faculty perspective, an added benefit is the insight gained for future course modifications.

As shown in the grading rubric at the end of this appendix, Project 3 fosters critical thinking by encouraging and rewarding creativity. The very nature of the project promotes a critical review of the course to identify improvement possibilities. Within a semester, we require each team to register its idea to avoid duplication across teams. Examples of past team recommendations include creating new projects for the course, designing games to help students learn the content or review for exams, and developing handouts that describe new course activities. For instance, teams have written new budgeting projects for service and agricultural settings, created games based on popular television shows like Survivor or Jeopardy, and proposed activities such as study buddies, peer tutoring, and shadowing an accounting professional. We subsequently have implemented some project ideas, such as changing the context of course assignments, as well as preparing handouts to clarify course content and Excel functions required to complete the projects. In addition, the games provide an interactive way to review course material for tests.

Project 3 also integrates the personal competencies of written communication and technology. As part of this project, teams prepare a report describing their suggested course improvement, which must conform to our minimum writing rules (see Appendix B). The project incorporates technology by using PowerPoint to present the team recommendations. To facilitate grading during the presentation, each team provides a copy of its PowerPoint slides prior to presenting.

In this appendix we provide the handout students receive describing Project 3, as well as our grading rubric. As noted in these materials, the written report, creativity, and presentation each account for 30% of the grade, while the remaining 10% relates to the PowerPoint slides. We evaluate the written report for compliance with the assignment requirements and adherence to the minimum writing rules. For creativity, we consider the originality of the idea and the quality of any supplemental material. Ideas repeated across semesters are scored lower on the originality element. We assess the presentation based on its conformity to the handout describing the characteristics of effective presentations. As for the PowerPoint slides, we review them for grammatical correctness. We also expect the content of

the slides to be limited to bullet points rather than sentences and reward students for including animation or sound effects.

Presentation practice: As with most skills, practice improves performance. As part of their preparation for Project 3, students individually present an article from a practitioner journal during the semester. These short presentations allow students to practice their oral communication skills and benefit the rest of the class by describing current issues related to the course or accounting careers. Students select an article from a list we provide of short, non-technical articles in journals such as *Strategic Finance* or *CFO*. We intentionally choose articles with content that students will be more comfortable presenting and that students can describe within a three- to five-minute time limit. An alternative would be to have students present short chapter problems or course content to practice making class presentations. However, students are often apprehensive about the ''correctness'' when presenting this type of information. Thus, we try to ease this stress in the practice presentations.

As part of the assignment, students also submit a one-page, bullet-point outline of the article. For the first two months of the semester, we include one or two presentations each class period. During the presentations, we complete an evaluation form that assigns 75% of the grade to the criteria on the effective presentations handout, which emphasize the student's presentation skills, and the remaining 25% to content coverage and the student's outline of the article. While the presentations consume class time, we believe it is important for students to have multiple opportunities to speak in front of the class so that they can increase their comfort with public speaking.

INSTRUCTIONS FOR FUTURE COURSE SUGGESTIONS

Each team will create and design an assignment, project, or "helpful handout" (= the product) for next year's class. The team will prepare a brief written report and make an 8–10 minute presentation at the end of the semester.

	DUE DATES	
Agenda:	Tuesday, April 6th – hard copy due – via Blackboard (subject: **P3 Agenda**)	
Idea registration deadline:	Friday, April 9th via e-mail (subject: **P3 Idea**)	
PPT presentation file:	Thursday, April 22nd to your instructor via e-mail by 11:00 am	
	E-mail subject: **P3 LeaderLastNameFirstInitial**	
	Include any additional files needed for your presentation	
Printed copies of written report and PPT slides:	Thursday, April 22nd – beginning of class	

Pass on your hard-won knowledge of some aspect of the class.

The product your team designs can be…
Long or short
In-class or out-of-class
Team, individual, or both
Completed at one time or over several classes

Stretch Your Creativity

The product must be "in good taste" and not violate any laws or University regulations.

Written Report   **30 points**
Printed version due by April 22nd
   Content (20 points)
      Summary: (3 page maximum)
         (double-spaced, typed, 12 font, 1-inch margins)
         ⇒ Description and purpose
         ⇒ Objectives and instructions
         ⇒ Evaluation and grading (% of class grade, point distribution
            within the product, etc.)
      Product in appendix with appropriate solution
   Grammar and organization (10 points)
      (1 point off for each error)

Creativity   **30 points**
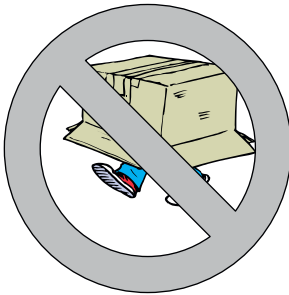
Presentation   **30 points**
      Professional presence and enthusiasm
      Well-prepared and well-rehearsed
      Review the handout *Tips for Effective Presentations*

PowerPoint   **10 points**
      Printed version (6 slides to a page) due by April 22nd
      (1 point off for each grammatical error)

IDEA REGISTRATION

When your team settles on an ***IDEA***, ''register'' the idea with your
professor via e-mail. The first team to register an idea has priority on
that idea. If two teams in a section are using similar ideas, the leader
should make sure your professor approves the second team's work as
distinct from the first team's idea.

GRADING RUBRIC FOR PROJECT 3

Team #
Topic

Written Report (30 pts)	Score	Notes

Description (1–3) _____
Purpose/Objective clearly stated (1–3) _____
Evaluation/Grading detailed (1–3) _____
Appendix containing proposed handout (1–5) _____
Solution included (1–3) _____

Compliance (1 each)
3 pages (without Appendix) _____
Double spaced _____
12 font and 1″ margins _____

Grammar (10)
Note: 1 point per mistake _____

Presentation (30 pts)

E-mail subject correct (1) _____
Presentation checklist compliance (22) _____
Slide 1 = Topic and Group members (1) _____
Slide 2 = Overview (1) _____
Slide 3 = Motivation (1) _____
Last Slide = Conclusion (or Biblio) (1) _____
Bullet points – not sentences (2) _____
Graphics/animation (1) _____

PowerPoint (10 pts)

6 slides to a page on printout (2) _____
Grammar (8) _____
Note: 1 point per mistake _____

Creativity (30 pts)

_____

Total Score _____

RESUME AS A BALANCED SCORECARD: TEACHING THE BALANCED SCORECARD USING ANALOGY

M. Christian Mastilak and Michele Matherly

ABSTRACT

In managerial accounting courses, students lacking business experience find the balanced scorecard (BSC) an inherently difficult topic to understand. Students may lack an understanding of business strategy, the BSC's perspectives, and the measures that a BSC uses to report performance. This chapter aims to assist instructors who teach the BSC by developing an analogy to a resume, which is a familiar concept to students. The analogy draws upon similarities between the BSC and a well-constructed resume: a cohesive strategy, multiple perspectives or areas, and multiple types of measures for each area. In using this approach, the instructor guides students through the process of viewing a resume as a vehicle for conveying a job-search strategy, similar to the way a BSC communicates an organization's strategy. Thus, students can apply their knowledge of the familiar (their own resumes) to the unfamiliar (the BSC). The chapter provides implementation guidance and results of student surveys. Our students responded positively to the exercise, saying that they learned the basics of the BSC, and even found the exercise enjoyable.

A popular recent development in managerial accounting is the strategic performance measurement system called the balanced scorecard (BSC). According to the Balanced Scorecard Institute (www.balancedscorecard.org), many well-known organizations have adopted the BSC approach, including General Electric, IBM, Saatchi & Saatchi, and Siemens AG. With the BSC, organizations decompose their strategies into strategic objectives, develop a strategy map identifying the causal linkages in their strategic objectives, select performance measures that communicate their objectives, and link the measures together in an integrated performance measurement system (Kaplan & Norton, 2001, p. 87, 2007, p. 157). A BSC creates "balance" by grouping financial and nonfinancial, leading and lagging, and short-term and long-term performance measures into perspectives. Measurement of multiple perspectives allows managers to motivate behavior on a variety of dimensions and to mitigate myopic decision making. For a thorough discussion of the historical and conceptual development of the BSC, see Kaplan (2009). The BSC is such an important topic in managerial accounting education that even most introductory managerial accounting textbooks cover it (e.g., Garrison, Noreen, & Brewer, 2008; Hilton, 2006). The BSC's inclusion in introductory texts also implies that the topic is relevant to nonaccounting majors, who may not learn it in their other business courses.

While the conceptual underpinnings of the BSC are not complex, we have found that teaching the BSC to students who lack business experience can be difficult. Understanding the value of the BSC requires an intimate knowledge of a company's strategy, the various BSC perspectives, and the measures available to a company (Kaplan & Norton, 2005, pp. 172–173, 2007, p. 154). Students, whether taking undergraduate introductory managerial accounting, cost accounting, or even MBA-level courses, may not have worked beyond entry-level jobs, which offer little or no experience with management, strategy development, or performance measurement. Textbook treatment of BSC topics often lacks specifics, in part because of the difficulty of conveying the detailed company information necessary for a meaningful BSC presentation. Faculty who try to supplement with BSC cases may still find that students struggle with this format due to their limited knowledge of the strategies pursued by the companies described in the cases (Barsky, Catanach, & Lafond, 2008, p. 288). In addition to a lack of business experience, students' diverse backgrounds afford few common experiences that instructors can draw upon when teaching a highly detailed topic like the BSC. Thus, the BSC subject matter and the students to whom instructors must teach it do not match each other well.

To address this mismatch, the chapter introduces a BSC teaching approach, suitable for managerial or cost accounting courses, that relies upon an experience common to college students at any level: the creation of a resume. Students expect to pursue postgraduation employment and often seek internships prior to graduation. Their career-search strategy, as evidenced by their resumes, can be used as an analogy for a company's profit-seeking [or, in the case of a nonprofit organization, constituency-serving (Kaplan, 2001, p. 353)] mission. Instructors can parallel the resume's areas of emphasis (education, employment, extracurricular activities, etc.) and the specific achievements listed therein (GPA, degrees earned or expected, work experiences, student group leadership activities, etc.) as analogies for the perspectives and measures in a BSC. Thus, instructors can assist students' learning about the BSC by drawing upon the resume as a common, familiar, relevant, and tangible experience.

We have organized the remainder of this chapter as follows. We begin by describing commonalities between the BSC and a resume. Next, we provide teaching notes and comments designed to help instructors introduce this BSC–resume analogy in their classes. Then, we discuss student feedback, followed by the conclusion and limitations of this approach.

COMMONALITIES BETWEEN THE BSC AND A RESUME

For teaching purposes, instructors can emphasize several common features between a properly developed BSC and a well-written resume. Here, we enumerate four features: an overall strategy, multiple perspectives or areas, specific measures within each perspective or area, and multiple types of measures.

Overall Strategy

A successful BSC depends on the creation of an overall strategy and the documentation of that strategy in a strategy map (Kaplan & Norton, 2001, p. 90). This strategy map details the BSC's perspectives, the linkages among these perspectives, and the specific metrics in each perspective. For example, two different automobile manufacturers might have very different strategies. One firm's strategy might focus on high quality, performance, and design, while the other firm's strategy might focus on low cost, reliability, and fuel

economy. Each firm will communicate its strategy by the measures included in its BSC. In the same way, a nonprofit organization's mission emphasizes meeting its constituency's needs instead of profit maximization. Consequently, the measures in its financial perspective will reflect sustainability and adequacy rather than shareholder returns. The end goal of constituent service represents the final perspective in a nonprofit organization's strategic plan (Kaplan, 2001, p. 353).

Similarly, a resume derives from and supports an overall professional objective, and job seekers should design it to increase the likelihood of meeting that objective (Corwin, Grappo, & Lewis, 2004, p. 13; Marcus, 2003, p. 40). Resumes often include introductory summaries or stated objectives to assist readers in assessing the candidate. These objectives also determine the areas and measures to be included. For example, individuals searching for executive-level employment might downplay details of their education or college activities and emphasize achievements in their recent, management-level employment. For students seeking entry-level employment, however, education makes up a larger portion of their qualifications. Thus, details of their education, such as major, GPA, honors, etc., are more relevant. Also, job seekers often have particular resume needs, such as minimizing the appearance of job-hopping, long periods of unemployment, or advanced age (Marcus, 2003, p. 40). Thus, just as firms individually craft BSCs to reflect their strategies, individuals should tailor their resumes to reflect particular job-search strategies.

Multiple Perspectives or Areas of Emphasis

One of the elements of "balance" in a BSC is the inclusion of multiple perspectives (Kaplan & Norton, 2001, p. 90, 2005, p. 173). Generally, these perspectives consist of learning and growth, internal business processes, customer satisfaction, and financial performance. These perspectives capture how a firm achieves its strategy, and help to prevent management from focusing myopically on the financial end result. A BSC also ties these perspectives together in a logical sequence. For example, achieving learning and growth objectives leads to excellence in business processes, which creates customer satisfaction, which ultimately produces the desired financial performance. Whatever the strategy, the BSC framework encourages organizations to view the end goal as the result of a process, and provides the measures necessary to evaluate performance throughout the stages of the process.

Resumes also consist of various areas or perspectives, such as career objective and introduction, evidence of learning (such as education and training), evidence of performance (such as honors and awards, prior work experience, and leadership roles in organizations), networking activities (such as membership in professional organizations), and the like. These areas report on the candidate's preparation and qualifications for the sought-after position. As noted above, the job-search strategy a candidate employs will determine the inclusion and extent of these different areas. While not always evident from the structure of a resume, job seekers can link these areas together as a cohesive strategy to help the candidate present his qualifications. For example, education gives the candidate a basic body of knowledge. Additional information from other areas of the resume, such as certifications, honors, and awards, can supplement the fact that a candidate has or expects to earn a particular degree. The candidate's employment experience, leadership and volunteer activities provide evidence that individual will apply the body of knowledge with sound judgment and offer the prospective employer a well-rounded and useful employee.

The outcomes of the current job search, such as interviews and job offers, do not appear on a candidate's resume, while the outcomes related to a BSC, such as financial results for shareholders, do. This difference is not as great as it might initially appear. The final outcome of the BSC (such as financial performance) is generally measured historically (i.e., with backward-looking measures such as return on investment), while the business processes leading up to that final result are more likely to be measured prospectively (i.e., with forward-looking measures). Thus, the time period for which many of the forward-looking BSC measures predict a financial outcome has not yet occurred. This aspect of the BSC is analogous to the fact that the current job search is still ongoing, and results from the candidate's previous job searches do appear on a candidate's resume, just as prior periods' financial results are available for comparison in a BSC. Thus, both the BSC and resume emphasize the perspectives or areas where success will lead to achieving the final result.

Measures Within Each Perspective or Area

The BSC contains measures within each of the perspectives (Kaplan & Norton, 2005, p. 174). For example, the financial perspective may contain such measures as return on investment, accounts receivable turnover, or current ratio. Customer measures may include market share, customer

satisfaction and loyalty, or on-time delivery. These measures give managers feedback about their expected and actual performance. When taken as a whole, they should both paint a broad picture of the company's historical performance and give an indication of expected future performance.

Similarly, each area of a resume includes measures or evidence of achievements and expectations (Corwin et al., 2004, p. 16; Marcus, 2003, p. 8). Education measures may consist of degrees earned, institutions attended, GPA, honors (such as *cum laude*), and specific courses taken. Experience measures may include prior or current employers, positions held and the respective dates of each, achievements (such as increases in sales or profits), and increases in responsibility over time. Extracurricular activities may highlight organizations joined, led or formed, positions within each organization, and possibly descriptions of lesser known organizations. Skills sections may note levels of fluency in foreign language or abilities in relevant software applications. For fields in which results may be difficult to measure, such as graphic design, the resume may also contain a portfolio of work output to demonstrate the candidate's achievements.

Multiple Types of Measures

The BSC includes multiple types of measures, including financial and nonfinancial measures and leading and lagging indicators, across all the perspectives (Kaplan & Norton, 2001, p. 87). As with the multiple perspectives, this variety of measures helps to create "balance" in the BSC and thus discourages managers from focusing on historical, dollar-denominated measures of performance. For example, hours spent on employee training, a nonfinancial measure in the learning and growth perspective, may be a leading indicator of future changes in the dollar value of scrap, which is a lagging financial measure in the internal business processes perspective. The addition of leading measures and nonfinancial measures to traditional lagging financial measures, such as variances, allows managers to foresee and possibly prevent problems with the lagging measures in the financial perspective.

A resume also contains multiple types of measures. Some measures are quantitative, such as GPA or number of credit hours earned, while other measures are qualitative, such as personal characteristics or club member-ship. Some measures are historical indicators, such as degrees earned or positions held, while others are prospective indicators, such as advanced degrees expected in the future, increased levels of authority expected from

future positions, or expected completion dates of certification examinations or doctoral dissertations. These different types of measures found in a resume reflect the complementary types of measures in a BSC. The quantitative and qualitative measures parallel the BSC's financial and nonfinancial measures, while the historical and prospective indicators mirror the BSC's leading and lagging measures.

In sum, the BSC and the resume contain many of the same essential elements. Instructors can capitalize on these similarities to help students understand the BSC by relating it to their resumes. The following section contains some suggestions for using this BSC–resume analogy approach in the classroom.

TEACHING NOTES AND COMMENTS

Here we provide several teaching notes to help instructors adopt this approach and successfully link the BSC to students' resumes. We group the notes as follows: the general teaching approach, using BSC-specific language when describing the resume, specifying metrics for each perspective, and being aware of the limitations of the analogy.

The General Teaching Approach

Instructors can complete the BSC-analogy exercise within one 50-min class session. Preparation prior to the class session involves becoming familiar with the approach and requesting ahead of time that students bring their resumes to class the day the instructor plans to use this exercise. Having resumes available helps students recall the format and contents of their resumes. In addition, students can use the ideas generated and discussed during class to note potential improvements to their resumes.

We open the exercise by giving an overview of the BSC, including the strategy map, link between strategy and perspectives, link between strategy and metrics, and the various types of metrics. We find that comparing hypothetical BSCs for well-known and very different companies in a common industry (such as Rolls-Royce and Kia in the automotive industry) helps students understand the importance of strategy to the perspectives and to the choice of measures.

To segue to the resume exercise, we detail the rich and organization-specific nature of the BSC. We also highlight the difficulty in generating a

BSC without knowing an organization's strategy and available measures. Then, we introduce a BSC analogy that students understand. We explicitly state that this exercise draws on something students have in common; presumably, all will seek a job after graduation. An amusing way of making this point is a quick show-of-hands survey asking which students would like a job after they graduate.

Next, we introduce the resume as a way to communicate the students' job-search strategy, similar to the way a BSC conveys an organization's strategy. We begin by asking students to specify possible strategies, and select one or two and write them on the board. Students may start by merely mentioning activities, such as earning a degree, obtaining certification (e.g., CPA or CMA), acquiring job experience including internships, participating in extracurricular activities and pursuing leadership roles within those activities, networking, and developing interviewing skills. The instructor must guide students toward turning these disjointed activities into a coherent strategy. For example, a strategy might be: "My education has provided me with content knowledge, which I have applied, reinforced and supplemented with relevant work experience and leadership roles in student and other volunteer organizations. Further, I have made many business contacts who will be a beneficial network of future colleagues, employers and business partners. Therefore, my knowledge, experience and network combine to make me a valuable employee for potential employers."

The strategy may also include specific approaches to ensure success for a particular student's situation (e.g., emphasizing well-rounded experience to overcome a relatively weak GPA). Note that it is not crucial that this strategy be all-encompassing or the best possible job-search strategy. Rather, for present purposes it is more important that the instructor identify a coherent, multipart strategy to use as a framework for the exercise. Fig. 1 depicts an example of the communication of a strategy through four linked resume areas with multiple measures for each area.

Students' diverse situations can yield different strategies (much like the automotive industry example). Some students may decide to pursue a strategy that emphasizes high academic achievement, while others choose a strategy that emphasizes being well rounded or a team player. Instructors may use this opportunity to discuss how different strategies lead to different resumes. For example, a high academic achiever may focus heavily on GPA, awards, and scholarships, and may have fewer extracurricular activities. On the other hand, a student with an average GPA, who spent more time involved in professional and student organizations, may minimize the education section of his resume, while emphasizing the extracurricular

Resume Areas (analogous to BSC Perspectives)

Learning	Performance	Networking	Employment Outcomes

Education
Degrees earned
Majors and minors
Courses taken
Certification

Honors and Awards
List of honors and awards

Interview Opportunities

Training
Continuing education
Certificates

Experience
Positions held and dates
Achievements
Promotions
Number of subordinates

Networking
Professional organizations joined
Participation in activities and events

Job Offer

Leadership and Extra-curricular Activities
Organizations joined and led
Achievements

Fig. 1. Example of Strategy Map for a Resume. *Note:* This figure depicts an example of a job-search strategy, with resume areas (analogous to BSC perspectives), elements of strategy and specific measures. We list areas (perspectives) on top and each rectangle contains the elements of strategy in bold and performance measures in italics. The Employment Outcomes area does not appear on a resume, similar to how future financial performance does not appear on the BSC for the time period during which the firm reports its leading measures. The particular job-search strategy depicted here is, "My education has provided me with content knowledge, which I have applied, reinforced and supplemented with relevant work experience and leadership roles in student and other volunteer organizations. Further, I have made many business contacts who will be a beneficial network of future colleagues, employers and business partners. Therefore, my knowledge, experience and network combine to make me a valuable employee for potential employers."

activities. Thus, these two students will have different resumes, just as the two example automobile manufacturers will design different BSCs.

Once we write the strategy on the board, we ask students to supply various perspectives from which they and potential employers can view their job-search strategy. Students will suggest the usual resume areas, such as education, employment, honors and awards, and extracurricular and leadership activities. Then, we link these perspectives together and to the various components of the strategy using arrows and boxes as necessary to present a graphical depiction of the resume similar to a scorecard (see Fig. 1).

Within each perspective, we ask students for possible metrics that they can use to determine and demonstrate success for that perspective. Students might measure education by listing facts such as major, GPA, etc. Again, we take care to link these metrics to the strategy, and discuss the relevance of particular suggested measures to the given strategy. For example, previous summer work experience as an amusement park cashier may demonstrate both trustworthiness to handle assets subject to appropriation and aptitude for mental arithmetic. This experience may be relevant to someone seeking employment in a banking or internal auditing setting. Experience as a rides operator at that same amusement park may be less relevant to banking or auditing, but might be relevant to someone seeking a position in operations management or mechanical engineering. Therefore, whether and how prominently a particular measure appears on a resume will be strategy dependent. Optionally, instructors can emphasize this point by creating two resumes simultaneously for candidates in different fields, or by having students work the exercise in small groups rather than in one common group.

Once we add measures to the resume-scorecard, we ask students whether targets are appropriate for each measure, and if so, what those targets might be. For example, students might mention a particular GPA, a certification relevant to a field, or a level of leadership within a student organization. Here, the instructor might also consider including forward-looking measures, such as a trajectory of promotions pointing toward a successful future. It is also useful to emphasize that the targets chosen should reflect the employers' needs, because employers judge candidates' performance against the employers' expectations. For example, accounting firms may expect a particular GPA, familiarity with International Financial Reporting Standards, or eligibility to take the CPA exam. Consequently, to receive a job offer from these employers, students must aim for the employers' targets, rather than any targets the student might select.

Finally, just as organizations regularly revise BSCs to reflect periodic performance and updated targets, individuals also regularly update their

resumes to reflect achievements and advances toward goals. Student may revise the GPA each semester, add internships or extracurricular activities, or change the objective (e.g., from "obtain an internship" to "obtain full-time employment").

Use BSC-Specific Language

Instructors must be careful to keep this exercise from devolving into a mere resume-writing workshop. Thus, we stress that we use the resume as an analogy for the BSC rather than an end in itself. To underscore the analogy, instructors should use BSC-specific language when describing the resume. For example, learning, performance, networking, and employment outcomes are "perspectives," and GPA, positions held, and organizations led are "measures." Also, instructors should emphasize the "balance" by identifying the leading and lagging measures, as well as the quantitative and qualitative measures, contained in the resume. Finally, at the end of the exercise, instructors should summarize the resume-as-BSC analogy by reiterating the basic concepts of the BSC, and how the resume and the BSC achieve many of the same goals.

Specify Measures, Not Just Activities

Given that the BSC contains measures within each perspective, it is important that the resume analogy do the same. Instructors must encourage students to develop measures of performance in each perspective, rather than merely listing activities or experiences. These measures need not be elaborate or obscure, but they must be included. Thus, education can be measured by the earning of a degree, and can be further refined with measures of GPA and choice of additional major(s) or minor(s) (a qualitative measure). Similarly, work experience can be measured by listing job responsibilities or by highlighting achievements, such as number of people managed, cost savings or profitability realized, or improvements implemented (Corwin et al., 2004, p. 14; Marcus, 2003, p. 13). Students may struggle at first with the difference between listing activities and defining measures. Instructors may give guidance early, but by the end of the exercise students should be able to suggest measures on their own.

Do Not Stress the Analogy Too Far

For this activity, the resume serves as a bridge from something familiar to something unfamiliar. However, instructors should also highlight the differences between a resume and the BSC. For example, firms often prepare the BSC at various levels of an organization, with different specific measures at each level; a resume, on the other hand, is unique to each individual candidate and has no "levels." Developing a BSC may take months or years, and may require the gathering of data not currently in existence (Kaplan & Norton, 2006, p. 231); resumes are generally simpler to create and to update. Firms use a BSC as an internal tool, rarely communicated to people outside the organization; students create resumes explicitly to communicate their qualifications and achievements to others. As with all analogies, the BSC–resume analogy breaks down when taken too far, and instructors must make students aware of the limitations of this analogy to avoid misunderstandings about the BSC.

Similarly, it may not be feasible to provide credible measures for all the perspectives of a resume. For example, students with little work experience may not have outcomes related to networking, which is analogous to customer service in a traditional BSC. In contrast, experienced job seekers will have a history of positions held, promotions and achievements that demonstrate their ability to satisfy external parties (i.e., employers). Instructors can point out this difference, and use it to demonstrate the importance of an overall strategy that seeks to complement shortcomings, such as limited work experience, with strengths in other areas.

Further, the four usual BSC perspectives do not need to relate to a particular resume area. For instance, it is relatively easy to compare the BSC's learning and growth perspective to the education area of a resume. Nevertheless, instructors should not feel compelled to draw similar comparisons with all four perspectives. The commonalities (an overall strategy leading to a multi-perspective view of a process, with measures within each perspective) are sufficient for the overall analogy to be beneficial.

INSTITUTIONAL SETTING AND STUDENT FEEDBACK

We have implemented this BSC–resume analogy in undergraduate and MBA introductory managerial accounting courses at a medium-sized Jesuit,

Catholic university. We collected student feedback during a recent semester when we both taught the introductory managerial accounting course. One instructor used a traditional approach to the course using Noreen, Brewer, and Garrison (2008), while the other used a business planning model approach based on Barsky and Catanach (2005). We administered the exercise near the end of the semester. The instructor using the business planning approach mentioned the BSC early in the semester but did not cover measurements for performance evaluation in detail then. Neither of us had yet covered responsibility accounting topics such as ROI and residual income. Despite the differences in approach, we noted no instructor-level differences in student feedback, so we have combined responses below. Our students were "traditional" undergraduates, generally sophomores and above. Students were primarily majoring in marketing, finance, management and accounting ($n = 27$, 15, 13, and 11, respectively, out of 82 respondents). Other business and nonbusiness majors were present in smaller numbers (for all other majors, $n < 10$).

We believe the approach is easily transferrable to other settings with "traditional" undergraduate students. The exercise is self-contained, not requiring more than a single class period, and does not depend on using a particular approach to the course as a whole. The exercise relies on very little except what is common to these students, and requires no knowledge that an introductory managerial accounting student would not have. The only caveat is that we expect students to have made a resume, which some students early in their collegiate careers may not yet have done.

We believe the exercise is somewhat less appropriate for students with business experience, such as older undergraduates or MBA students in introductory courses. These students may encounter less difficulty imagining the implementation of a BSC, so the apparent simplicity of the analogy may frustrate them.

To assess whether the approach has been beneficial, we asked undergraduate students to respond to a series of questions. Responses below indicate the percent of students ($n = 82$ for all questions) who either "agree" or "strongly agree" with the following statements that the resume as a BSC exercise:

1. Was helpful in understanding the overall idea of a BSC: 85%
2. Was helpful in understanding the idea that the BSC is a way to measure strategic performance: 84%
3. Was helpful in understanding the idea that a BSC contains multiple perspectives: 93%

4. Was helpful in thinking about how to determine what measures should be included in a BSC: 74%
5. Helped me understand that a BSC is a valuable management tool: 85%
6. Was enjoyable: 63%
7. Should be used in future classes: 83%

Further, 90% of students either agreed or strongly agreed that they would prefer more exercises that, like the BSC–resume analogy, are directly relevant to their current lives and experiences.

Overall, the student feedback reveals that students considered the exercise useful in conveying the basic concepts of a BSC. One student commented, "I did find the class helpful because it tied in the scorecard to something familiar to me: myself. Using my resume, which I know so well, to explain a balanced scorecard was a cool way to learn."

CONCLUSION AND LIMITATIONS

The popularity of the BSC and its potential to improve strategic performance make it a worthwhile topic to include in managerial accounting courses. However, because the BSC comes directly from strategies and measures used in real-life companies, classroom coverage of this topic challenges students, especially those with little business experience. Here, we describe an exercise that draws an analogy between the unfamiliar BSC and the more familiar concept of a student's resume. Student feedback shows that students found the approach helpful and enjoyable.

Limitations of our analogy approach include the classroom method of delivery, as opposed to a more experiential learning approach as suggested by Barsky et al. (2008, p. 289), and limited evidence of whether our approach contributed to actual learning or only the belief that students learned. However, future studies can compare our BSC–resume analogy approach to other approaches and document whether our approach facilitates learning. Also, extensions to our approach might combine the classroom introduction to the BSC outlined here with a more experiential approach to reinforce the desired learning.

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DO ONLINE HOMEWORK SYSTEMS IMPROVE STUDENT PERFORMANCE?

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ABSTRACT

This chapter compares student performance and course satisfaction in two large sections of an introductory financial accounting course. The students in one section used an online homework management system (OHMS), whereas the students in the other section used traditional homework methods. While an OHMS saves instructors' valuable time, there is little extant research on how these systems affect students. Our study compares several performance measures and a general course satisfaction survey across the two groups of students. The results provide some evidence that an OHMS enhances students' performance on some of the performance measures. Our results also show that there is no effect on students' satisfaction in the course.

Online homework management systems (OHMS) are becoming ubiquitous. They allow instructors to assign and collect homework online; the systems then grade the homework and enter the grades into the instructor's grade book without any instructor involvement. While early versions of these

programs provided only very limited objective type problems (such as multiple choice or true/false), later versions allow instructors to assign the same exercises and homework problems that are found in the end of chapter material of the typical textbook. These systems have the obvious potential to save instructors' valuable grading time, but the question arises as to whether these systems provide benefits to students in terms of improved performance or greater satisfaction. The purpose of this study is to determine if the use of OHMS as compared with traditional homework methods in an introductory financial accounting course results in differences in student grades and course satisfaction.

Students in two large classes of introductory financial accounting taught by the same instructor received the same in-class experiences, exams, etc. The only difference was that students in one class used the OHMS to complete and submit their homework, while the students in the other class used traditional homework methods. Class performance and student satisfaction with the course and instructor were compared for the two groups. Results show that performance on some measures improved for students who used the OHMS. There were no significant differences in satisfaction between the groups.

MOTIVATION AND LITERATURE REVIEW

Possible Effects of the Use of OHMS

Student performance could be affected by the use of OHMS in at least three ways. One feature of these systems is that they provide instantaneous feedback to students, as opposed to the students receiving delayed feedback when homework is covered in class in the traditional manner. Online systems allow students to revise their homework answers until they get them correct before submitting them. It is possible that this feedback will increase the learning that takes place while doing the homework. Bangert-Drowns, Kulik, Kulik, and Morgan (1991, p. 233) found that "When students are informed of the correct answer after responding with relatively little prompting to questions on relatively complex presentations, their ability to accurately retrieve information later on is greatly improved." Kulik and Kulik (1988, p. 79) found in a meta-analysis that although the results on the relationship between the timing of feedback and learning are mixed, "Applied studies using actual classroom quizzes and real learning materials have usually found immediate feedback to be more effective than delayed."

On the other hand, Lindquist and Olsen (2007, p. 105) examined whether students could receive too much feedback. They used junior intermediate accounting students to test whether providing no solutions, check figures, or completed solutions while students were completing homework problems affected student performance and satisfaction. They found no significant differences in student test performance, but they found that students receiving no solutions or check figures were least satisfied with the assistance they received and more frustrated when doing homework. However, these same students perceived that they had the greatest amount of learning.

The use of the OHMS can also reduce the ambiguity a student may face while solving complex problems. For example, consider a problem involving the presentation of a balance sheet. An OHMS might ask the student to select an account title from an array, and then enter (or select) an amount. The system thus provides structure for the answer. There is no structure provided for a student solving the problem on his/her own. Even if using a spreadsheet package, the student still has to know the basic format of a balance sheet as well as both the account title and the amount.

The third possibility is that students who submit their homework via a computer are likely to be more conscientious in doing their homework. Most of today's students were born in the "Computer Age." For them, there have always been computers, ATMs, cell phones, and calculators. It may seem natural for them to do homework on a computer-based platform. They are likely to perceive the discipline imposed by an OHMS as helpful and useful. These systems present assignments in order, together with their due dates and some include coaching. The imposed discipline and prompts may in turn result in increased attention to the homework, which could therefore lead to increased learning.

Another question in this study is whether student satisfaction is affected by the use of the OHMS. The instantaneous feedback, the decrease in ambiguity in solving homework problems, and the ability to submit the homework online without needing a printer could lead students to find both the course and the instructor of the course more satisfactory. On the other hand, there are possible reasons for student satisfaction to decrease. For example, students may find it difficult to access a computer or they may experience frustration if they encounter computer glitches.

The Effectiveness of OHMS

Until recently the only studies on the effectiveness of an OHMS were found in the teaching of science and math. Three studies, Bonham, Beichner, and

Deardorff (2001), Dufresne, Mestre, Hart, and Rath (2002), and Cheng, Thacker, Cardenas, and Crouch (2004), explored the use of OHMS in the teaching of introductory physics. The results are mixed. Bonham et al. (p. 294) found no significant differences in test and quiz averages between students in sections where OHMS was used and sections where it was not. They did find significantly higher homework scores in one of the OHMS sections. They attributed this difference to the OHMS students' ability to correct their homework before submitting their work (p. 295). They also found that OHMS students spent an average of 30 min to an hour more per week on homework. In contrast, the other two studies found a significant performance effect. Dufresne et al. (2002, p. 247) found the use of OHMS in introductory physics courses led to significantly higher overall exam performance. In their sample, they also found that students in the OHMS spent significantly more time on their homework versus those students using the traditional homework approach (p. 246). Additionally, Cheng et al. (2004, p. 1447) found that the use of graded OHMS homework versus ungraded traditional paper and pencil homework significantly increased student understanding of introductory physics concepts. They also found that students with "C" grades benefited most from the graded OHMS.

Arasasingham, Taagepera, Potter, Martorell, and Lonjers (2005, p. 1252) examined differences in performance for students in introductory chemistry courses. They compared sections using a web-based instructional homework program called "Mastering Chemistry" (MCWeb group), with sections not having access to the software. Both groups of students completed problem-based homework assignments; however, assignments differed in that the MCWeb group received immediate feedback, links to tutorials, and a unique set of questions each time they entered a unit. The authors' report significant improvements in performance as measured by in-class exams, pretests and posttests for the MCWeb group (p. 1254). They also found that the MCWeb group spent considerably more time on homework (p. 1261). However, it is not clear from the study design what drove those significant differences in performance, whether it was the types of questions available, the feedback, or the availability of tutorials.

In summary, although the research on the effect of computer-based work in science and math does not show consistent positive results on performance, none of it shows any negative impact from the use of online or computer-based work. Further, Arasasingham et al. and Cheng et al. report that students tend to devote more time and effort to computer or online based homework than they do to traditional methods. This additional time and effort could lead to enhanced performance.

Not much research has been conducted on the use of computer-based or online homework in accounting. Although several studies have considered various aspects of computer-based learning and assessment in accounting courses (see for example, Halabi, Tuovinen, & Farley, 2005, pp. 21–31; Marriott & Lau, 2008, pp. 73–88; Potter & Johnston, 2006, pp. 16–34; Edmonds & Edmonds, 2008, pp. 421–433), few articles have addressed the use of OHMS in accounting courses. Phillips and Johnson (2008) compared student test performance after using an OHMS with students using an artificial intelligence (AI) tutoring system which was designed to "allow a range on interactions similar to what could occur with a human tutor" (p. 7). The AI system provided for "back-and-forth exchange throughout the problem-solving process." They found that students using the AI system significantly outperformed those students using the OHMS on tests (p. 14).

Dillard-Eggars, Woten, Childs, and Coker (2008, p. 5) surveyed 241 students in accounting principles classes about their perceptions of the use of an OHMS. Some of the students were required to use it; others were offered the opportunity but were not required. They also tested whether the amount of homework a student did using the OHMS was related to their course grade. They found that 39 percent of the students perceived the use of the OHMS increased the amount of time they spent studying, while only 16 percent said that they spent less time (p. 7). A total of 53 percent of the students perceived that the use of the OHMS resulted in higher quality study time, and 15 percent perceived that it contributed to much higher quality study time (p. 8). They found that the course grade was significantly positively affected by the extent of OHMS homework (p. 11).

It should be noted that neither of the accounting-based studies compared the OHMS with the traditional homework approach. All of the students in the Dillard-Eggars et al.'s study had access to the OHMS and the Phillips and Johnson's study compared different computer-based approaches. The purpose of our study is to directly compare the effect of an OHMS with a traditional homework method. Our results are likely to be of interest to many accounting faculty who continue to use traditional homework methods, but may be contemplating using an OHMS.

These thoughts lead to the following research questions:

- Does the use of an OHMS rather than the use of a traditional homework method lead to improvements in student performance as measured by the overall course average, and by the various components of the course grade?

- Does the use of an OHMS rather than the use of a traditional homework method lead to improvements in student satisfaction as measured by a student satisfaction survey?

Other Factors Influencing Performance

Since the current study examines the effect of the use of OHMS on various measures of course performance, it is important to control for differences between the test groups as well as demographic variables that have been found to affect performance in accounting courses. These variables are gender, age, transfer status, SAT scores, and ethnicity.

We include gender because several studies have found a gender effect on performance in accounting courses; although, the results are not consistent. For example, Tyson (1989, p. 153) found female students outperformed male students; Doran, Bouillon, and Smith (1991, p. 74) found the opposite; and Carpenter, Friar, and Gascho Lipe (1993, p. 2) found no gender differences. The aforementioned study by Carpenter et al. (1993) also found that male minority students had significantly lower achievement levels than male nonminority students in introductory accounting courses. These gender and ethnicity differences may be due to other factors. Ward, Ward, Wilson, and Deck (1993, p. 239) found that there was a significant correlation between composite and math ACT scores which helped explain black students' successful completion of accounting principles. Gist, Goedde, and Ward (1996, p. 49) found that college GPA and SAT scores were significant in explaining minority student performance in principles of accounting. They also found that gender was not significant in explaining minority student performance. Similarly, Buckless, Gascho Lipe, and Ravenscroft (1991, p. 249) found gender effects disappear when they controlled for students' SAT or ACT scores.

Dillard-Eggars et al. (2008, p. 10) found a marginally significant negative relationship ($p = 0.059$) between a student's age and his/her perceptions of the benefits of the OHMS. They also found that older students reported significantly lower levels of understanding of topics when using the OHMS and lower overall satisfaction ratings for the OHMS experience. Although they provided no reason for these findings, they did report that older students also had significantly lower ACT and SAT scores and had taken fewer college credits. Transfer status is included because 32 percent (107 out of 333) in our sample were transfers.

RESEARCH DESIGN

Sample

The sample consisted of students in two sections (the OHMS section and the "traditional" section) of Principles of Accounting 1 at a large urban research university. The sections were taught by the same instructor, covered identical material, and the students had the same in-class experiences. Both sections were held in the morning and met twice a week. The classes were large sections (each had over 200 students although not all students chose to participate in the study) that met twice a week (for 80 min) in a lecture hall. All teaching was done by the professor; the TAs graded assignments, performed administrative tasks, and held office hours for informal help sessions.

All students completed the same assignments, took the same exams, were graded using the same point allocations and grading standards, and had access to the same teaching assistants. The only difference between the sections was that the students in the OHMS section completed their homework and had it graded using the OHMS and the students in the "traditional" section completed homework in the traditional manner and had it graded by teaching assistants.

OHMS versus "Traditional" Homework Systems

When purchasing their textbooks, the students received, at no additional cost, a registration code for the OHMS. The students in the OHMS section were given logon instructions and then registered for the system. They were then able to access a menu with the assignments listed by chapter and due dates. Each assignment consisted of between five and seven questions, which corresponded to particular exercises and problems in the textbook. After clicking on a particular chapter, the students were able to open each question individually and work on the question with unlimited time. After students completed a question, they were able to submit it for preliminary grading. The results section showed students which parts of an answer were incorrect but did not provide any suggested response or suggested help in revising answers. The students could change their answers as many times as they wished, and could exit the assignment and come back to it at a later time. The students chose when to submit their answers for grading. A homework grade for each chapter was calculated and the grade was entered in the instructor's grade book.

The students in the "traditional" section submitted homework in class. They were instructed to use spreadsheet or word processing programs as appropriate. No handwritten homework was accepted.

There was one difference in the way homework was graded. The OHMS students' homework was graded on correctness by the system; students were given credit for each "piece" of the problem or exercise that was entered correctly. To make the grading experience for both sections equitable, the "traditional" (non-OHMS) students who did not receive immediate feedback and did not have the opportunity to make changes to their homework were given credit based on effort and completeness.

Measures of Performance

Student grades were based on many performance measures. There were two in-class exams (a midterm and a final) and each exam covered about seven chapters' worth of material. The final examination was not cumulative. Class size dictated that the exams had to be machine-scorable so all questions were multiple choice. The questions were taken from the publisher's test bank and slightly modified. The topical content of the questions was very similar to the homework assignments, although the question style was different. There were eight versions of each exam (four for each section); each version of the exam was printed on a different color paper, so while the exams were identical in content they seemed very different in the eyes of the students. Further, since there were no "surprise" questions on the exam, the value attached to any cross section information dissemination was quite low.

There were several "at home" quizzes that were handed in before the chapter material was discussed in class. These were called "ICE's" (Introductory Chapter Exercises). The ICE's were easily answered by reading the chapter and were intended for that purpose. There were also several short written ethics cases and a large comprehensive accounting cycle problem. The comprehensive problem required students to take raw accounting data (essentially a list of events and transactions) and create journals, ledgers, worksheets, and financial statements. Each student's average grade was calculated by allocating 75 percent to examinations and chapter quizzes, 15 percent to homework, 5 percent to ethics cases, and 5 percent to the comprehensive problem. The student's highest exam score was counted twice in calculating the 75 percent.

Measures of Satisfaction

Student satisfaction was measured by a student satisfaction survey, adapted from one used in previous research (Wurst, Smarkola, & Gaffney, 2008, p. 1770). A copy of the survey is given in the appendix. The survey contained 16 items. Items were related to either satisfaction with the instructor (e.g., "With regard to fairness and impartiality, the instructor was …" or "the instructor seemed to be well prepared for class"), to assessment policies and procedures (e.g., "My grades were based on objective standards that were easily understood" or "workload expected was …"), or to general measures of satisfaction (e.g., "Would you choose this course again?"). The responses were scaled on a four-point Likert scale (e.g., absolutely, close, not nearly, absolutely never). None of the items related to the homework assignments or the homework manager system (OHMS). The purpose was to measure the efficacy of the homework manager system and its impact on overall course satisfaction; not student satisfaction with either the assignments or the system. The instructor's name was used in the actual instrument. In the example in the appendix, this has been changed to "The Professor."

In addition, scores on several questions on the university-administered teaching evaluations were examined. Specifically,

1. So far, the instructor has graded fairly (strongly agree, agree, neutral, disagree, and strongly disagree).
2. The instructor provided prompt feedback about exams, projects, rehearsals, and performances (strongly agree, agree, neutral, disagree, and strongly disagree).
3. The instructor taught this course well (strongly agree, agree, neutral, disagree, and strongly disagree).
4. The workload for this course was (too heavy, heavy, average, light, too light).

ANALYSIS AND RESULTS

Descriptive Statistics

There were a total of 333 students who completed the course and agreed to participate in the study. This included 127 students in the "traditional" group and 206 students in the OHMS group. While all students in the two sections were required to complete the course requirements, including completing

homework as required for their section, students could opt out of the study. The data for those students opting out is not included in the results. Table 1 provides descriptive statistics for the two groups, including frequency counts (and percentages) for gender, ethnicity, and transfer status, as well as mean SAT scores and age. A review of Table 1 shows that the two groups are very similar with respect to these demographic variables; but there are some significant differences. While both sections are ethnically very diverse, there is a significant difference in the relative proportion of Asians and whites in the two sections (χ^2 test of proportions p-value equals 0.02). The traditional group is 52 percent white and 20 percent Asian, whereas the OHMS group is 65 percent white and 8 percent Asian. The relative proportions of other ethnic groups are very similar. Similarly, the relative proportion of transfer students is significantly higher in the traditional group (χ^2-test p-value equals 0.005). SAT scores are, on average, higher in the OHMS group; but gender composition and average age are not significantly different.

Table 1. Descriptive Statistics.

Homework Group	Online Manager	Traditional
Frequency N (percent)		
Gender		
Female	92 (45)	55 (43)
Male	114 (55)	72 (57)
Ethnicity*		
African American	33 (16)	19 (16)
Asian	16 (8)	24 (20)
Hispanic	10 (5)	4 (3)
Caucasian	130 (65)	64 (52)
International	12 (6)	11 (9)
Transfer Student**		
No	127 (62)	97 (76)
Yes	79 (38)	30 (24)
Means (standard deviation)		
SAT-V (verbal score)***	542.6 (70.9)	507.2 (59.6)
SAT-M (math score)****	564.1 (71.1)	542.8 (67.9)
Age	19.7 (1.3)	19.5 (3.2)

*Significant at 0.02 (χ^2-test of proportion).
**Significant at 0.005 (χ^2-test of proportion).
***Significant at <0.0001 (t-test).
****Significant at 0.01 (t-test).

Test Results: Student Performance

Our primary research question is whether or not students in the OHMS group perform better than those in the "traditional" group. As previously mentioned, we collected multiple measures of performance to test this, including exam scores (EXAMS), homework scores (HOMEWORK), written ethics cases (CASES), a comprehensive accounting cycle problem (COMP), take-home chapter quizzes (ICES), as well as the student's overall course average (AVG). Because we have multiple measures of performance and covariates, we use a multiple analysis of covariance model (MAN-COVA). MANCOVA assesses the group differences (the OHMS group versus the "traditional") on multiple dependent variables (the performance measures) simultaneously (Hair, Anderson, & Tatham, 1987, p. 147). The null hypothesis being tested is the equality of a vector of means of the dependent variables across the two groups. To account for other factors affecting student course performance, we include demographic variables (SAT scores, age, gender, ethnicity, and transfer status) as control variables. SAT scores and age are continuous variables, gender and transfer status are binary categorical variables, and ethnicity is a five-level categorical variable. A priori, we expect the OHMS group to perform better than the "traditional" group.

Table 2 shows the MANCOVA results. Part A shows the MANCOVA overall test statistics and the ANCOVA results for each dependent variable separately. Part B shows the least squares means of the dependent variables for our primary variable of interest, the OHMS (MNGR). MNGR is coded as "Yes" for students in the OHMS group and "No" for students in the "traditional" group. We used Wilks' lambda as our overall MANCOVA test criteria. The Wilks' lambda approximate F statistic (shown in the first column) tests the hypothesis of no overall effect for each of the explanatory variables. Our statistical analysis provides other test measures (e.g., Hotelling–Lawley Trace and Pillai's Trace) that are not reported. In all instances, these provide the same results. The other columns provide univariate statistics (F-values) for each of the performance measures.

Overall, Table 2 results provide some evidence that performance improved for students using OHMS. The MNGR variable is significantly different between the two groups (Wilks' lambda p-value $= 0.0007$). Further, a review of the univariate results and the least squares means shows that the OHMS group performed significantly better on CASES (written ethics and decision-making cases) and COMP (the comprehensive accounting problem). While the differences were not significant for the other

Table 2. MANCOVA Results.

	Part A: Performance Measures: *F*-Value (*p*-Value)						
	MANCOVA results	ANCOVA results					
	Wilks' lambda	AVG	ICES	CASES	EXAMS	HOME-WORK	COMP
R^2		0.13	0.06	0.10	0.15	0.01	0.07
MNGR	4.01	1.89	1.00	11.21	0.75	0.03	9.50
	(0.0007)	(0.1703)	(0.3183)	(0.0009)	(0.3861)	(0.8691)	(0.0023)
SATV	1.88	8.60	0.03	0.22	12.74	0.07	0.32
	(0.0848)	(0.0037)	(0.8706)	(0.6360)	(0.0004)	(0.7909)	(0.5750)
SATM	3.46)	20.61	2.55	2.60	27.22	0.00	0.67
	(0.0026)	(<0.0001)	(0.1116)	(0.1077)	(<0.0001)	(0.9498)	(0.4147)
AGE	0.97	1.06	3.42	0.06	0.76	0.04	1.55
	(0.4446)	(0.3031)	(0.0654)	(0.8014)	(0.3836)	(0.8442)	(0.2137)
GENDER	1.97	0.06	2.78	1.19	0.85	0.19	5.73
	(0.0706)	(0.8079)	(0.0966)	(0.2754)	(0.3582)	(0.6604)	(0.0174)
ETHNIC	1.65	1.80	1.72	3.84	1.56	0.95	0.43
	(0.0258)	(0.1288)	(0.1459)	(0.0047)	(0.1848)	(0.4364)	(0.7891)
TRANSFER	0.86	0.38	0.00	1.67	0.79	0.00	0.00
	(0.5220)	(0.5404)	(0.9902)	(0.1969)	(0.3761)	(0.9913)	(0.9590)

	Part B: Least Squares Means – MNGR					
	AVG	ICES	CASES	EXAMS	HOMEWORK	COMP
No	0.72	0.72	0.47	0.72	0.86	0.73
Yes	0.74	0.75	0.57	0.73	0.86	0.82

Performance measures: AVG, overall course average; ICES, take-home chapter quizzes; CASES, written ethics cases; EXAMS, exam scores; HOMEWORK, homework score; COMP, comprehensive cycle problem.
Explanatory variables: MNGR, OHMS (homework manager system) vs. traditional system; SATV, SAT verbal score; SATM, SAT math score; AGE, student's age; GENDER, male or female; ETHNIC, student's ethnicity: African American, Asian, Hispanic, Caucasian, international; TRANSFER, transfer student (Yes or No).

performance measures, the least squares means show that the mean AVG (course average), EXAMS, and ICES scores are higher for the OHMS group.

As expected, the control variables for both the verbal and math SAT scores were significant in the overall MANCOVA results and for AVG and CASES. This is in line with results by Buckless et al. (1991, p. 248), who found that the use of SAT or ACT scores "greatly reduced" gender effects

on exam scores in Accounting Principles I and Intermediate Accounting I courses. It is also consistent with Gist et al. (1996, p. 49) who found that SAT scores significantly affected minority students' performance in principles of accounting courses. Others who report significant relationships between ACT or SAT scores and accounting course performance include Ward et al. (1993, p. 239) and Doran et al. (1991, p. 80).

We decided to further investigate the effect of the OHMS on student performance by examining separately the performance of students with different levels of SAT scores. Recall that Cheng et al. (2004, p. 1447) found that students with "C" grades benefited most from computer/online systems. Thus, it is possible that the OHMS might be more effective for one of the subgroups. To do this, we summed students' verbal and math SAT scores to obtain a combined SAT score and then divided the entire sample approximately into tertiles. The Middle SAT subgroup was defined as a combined verbal and math SAT equal to and greater than 1,020 and equal to and less than 1,130; the High SAT group was defined as a combined score greater than 1,130 and the Low SAT subgroup was defined as a combined score below 1,020. This resulted in a Middle SAT group of 95 students with complete information, a High SAT group of 103 students, and a Low SAT group of 89 students. We report the Middle SAT group results in Table 3 (MANCOVA and ANCOVA results). Overall, the MNGR variable (the Wilks' lambda) is significant (p-value $= 0.0134$). The ANCOVA results show that the MNGR variable is significant for students' course average (AVG), for CASES, and for COMP (the comprehensive accounting cycle problem). As Part B shows, the OHMS group performed better; that group earned a significantly higher overall course grade (AVG) as well as a significantly higher score on CASES and COMP. The MNGR variable is not significant in both the High and Low SAT subgroups (results not reported). This supports Cheng et al.'s (2004, p. 1447) findings and suggests that the OHMS is most beneficial for middle performing students.

Test Results: Student Satisfaction

We also examined the effect of the OHMS on students' satisfaction with the course. As previously discussed, a satisfaction survey was administered during the semester which consisted of 16 questions and contained both general satisfaction (6 items) and course-specific satisfaction questions (10 items). Each question had four possible answers, coded in the data 1 through 4. Answers coded 1 indicated satisfaction while those coded 4

Table 3.   MANCOVA Results: Middle SAT Group.

| | Part A: Performance Measures: *F*-Value (*p*-Value) | | | | | | |
| | MANCOVA results | ANCOVA results | | | | | |
	Wilks' lambda	AVG	ICES	CASES	EXAMS	HOME-WORK	COMP
R^2		0.17	0.19	0.11	0.18	0.07	0.09
MNGR	3.09	3.11	1.96	8.96	1.25	1.44	8.28
	(0.0134)	(0.0815)	(0.1650)	(0.0036)	(0.2672)	(0.2338)	(0.0051)
SATV	2.40	4.01	8.89	4.86	3.00	0.33	0.23
	(0.0444)	(0.0483)	(0.0037)	(0.0302)	(0.0871)	(0.5698)	(0.6321)
SATM	0.59	0.00	2.33	0.08	0.08	0.00	0.65
	(0.7082)	(0.9883)	(0.1307)	(0.7794)	(0.7832)	(0.9568)	(0.4211)
AGE	1.53	0.46	1.71	0.19	0.05	4.28	0.27
	(0.1912)	(0.5008)	(0.1945)	(0.6611)	(0.8321)	(0.0416)	(0.6058)
GENDER	2.98	4.21	0.01	0.69	6.63	0.25	1.58
	(0.0163)	(0.0432)	(0.9320)	(0.4071)	(0.0118)	(0.6171)	(0.2126)
ETHNIC	0.66	1.30	1.34	0.96	1.23	0.35	0.60
	(0.8620)	(0.2760)	(0.2613)	(0.4362)	(0.3055)	(0.8451)	(0.6614)
TRANSFER	0.67	0.80	0.03	0.01	0.92	0.04	1.37
	(0.6455)	(0.3732)	(0.8645)	(0.9279)	(0.3397)	(0.8508)	(0.2451)

| | Part B: Least Squares Means – MNGR | | | | | |
	AVG	ICES	CASES	EXAMS	HOMEWORK	COMP
No	0.69	0.67	0.49	0.68	0.80	0.74
Yes	0.72	0.72	0.60	0.70	0.85	0.86

Performance measures: AVG, overall course average; ICES, take-home chapter quizzes; CASES, written ethics cases; EXAMS, exam scores; HOMEWORK, homework score; COMP, comprehensive cycle problem.
Explanatory variables; MNGR, OHMS (homework manager system) vs. traditional system; SATV, SAT verbal score; SATM, SAT math score; AGE, student's age; GENDER, male or female; ETHNIC, student's ethnicity: African American, Asian, Hispanic, Caucasian, international; TRANSFER, transfer student (Yes or No).

indicated dissatisfaction. We obtained average general and specific satisfaction scores for each student by calculating each student's mean score. For the entire sample, the mean general satisfaction score is 2.17 and the mean course-specific satisfaction score is 1.91. These are significantly correlated at <0.0001 (the Pearson correlation coefficient is 0.6252). The survey was adapted from one used in prior research. In that research, the

Table 4. ANCOVA Results – Satisfaction Survey.

	F-Value	*p*-Value
MNGR	0.59	0.4415
SATV	0.17	0.6788
SATM	6.58	0.0108
AGE	1.42	0.2342
GENDER	0.42	0.5185
ETHNIC	0.45	0.7717
TRANSFER	1.26	0.2634
MODEL	1.22	0.2748
R^2	0.04	

Dependent variable: each student's mean course-specific satisfaction score.
Explanatory variable definitions; MNGR, OHMS (homework manager system) vs. traditional system; SATV, SAT verbal score; SATM, SAT math score; AGE, student's age; GENDER, male or female; ETHNIC, student's ethnicity: African American, Asian, Hispanic, Caucasian, international; TRANSFER, transfer student (Yes or No).

instrument was found to have strong internal reliability with a Cronbach's alpha of 0.848.

We used ANCOVA to test the efficacy of the OHMS on student satisfaction in the course. We had no a priori expectation with regards to the effect of the OHMS manager on student satisfaction. Conceivably, the effect could be either positive or negative. Table 4 provides the results. The dependent variable is each student's mean course-specific satisfaction score. The results in Table 4 show no significant differences in satisfaction between the two groups. Furthermore, the only significant control variable is SATM. A review of the university-administered end-of-semester student course assessment and evaluation scores shows similar results. Consequently, we conclude that the use of the online homework manager had no effect on students' satisfaction in the course.

CONCLUSION

This study compared the effect of an OHMS with the "traditional" homework method on students' course performance and course satisfaction. An OHMS offers several comparative advantages for students; specifically an OHMS provides instantaneous feedback and problem structure and can reduce problem ambiguity. These advantages can enhance student learning

and thus lead to improved performance. Our results provide some limited support for our expectation that students using the OHMS would perform better than students using the traditional homework method. Our results show that the OHMS group performed better on CASES and COMP, but no differently on ICES or EXAMS. It is easy to explain the lack of an effect for the ICES. These required students to read chapter materials and then to answer questions based on their reading. The lack of an effect on EXAMS is more puzzling. While we have no precise answer, we speculate that it could be due to problem style. The EXAMS used a multiple-choice format, while all of the homework was problems. In contrast, COMP (the comprehensive accounting cycle problem) is much more similar to the homework problem style. The COMP is, in essence, an aggregation of smaller problems. The similarity of COMP to the homework format and the dissimilarity of the exams to the homework may explain the results.

We can only speculate at the underlying causes of the lack of effect on student satisfaction. Perhaps students perceived no difference because to them homework in an introductory accounting course is simply a task to complete. The method of completing it is less important. Another possible explanation for this measured lack of effect could be in the instrument. The tool was based on several industry models and is "dis-confirmatory." These dis-confirmatory scales compare respondents' a priori expectations of an experience to their actual experiences. If the expectations align with the actual experiences, respondents report a satisfactory experience. Both groups expected homework; both groups had homework. The expectations of both groups aligned with their expectations; therefore, they perceived no difference in satisfaction attributable to the homework. It is possible that homework is not a factor in student-perceived satisfaction unless it is either exceptionally easy or extraordinarily onerous. These assignments were neither.

Implications and Limitations

Given the expected future shortages of qualified accounting faculty it is likely that the pressures for faculty to work efficiently will increase. One way that faculty can save time is to use an OHMS for collecting and grading homework. This may be particularly time saving as more large sections are demanded. However, we were concerned that the use of OHMS could have detrimental effects for students. It is comforting to find that using an OHMS did not have a negative effect on students; in fact, the outcome was slightly

positive for our students. Therefore, we support their use, at least in the settings described in this chapter.

Several limitations apply to this study and should be kept in mind when interpreting the results. First, the students were enrolled in large sections of an introductory accounting course and thus, the study's results may not generalize to small section courses or to major area courses. Second, the study used intact groups and thus, students were not randomly assigned to the sections. There could, thus, be self-selection bias. It should be noted, however, that any self-selection bias is mitigated by (1) the inclusion of demographic variables (gender, ethnicity, age, SAT scores, etc.) as control variables in the analysis, and (2) both sections were taught by the same instructor at similar time periods.

The OHMS used in this study did not provide students with any hints or guidance. It merely marked students' answers as correct or incorrect. Some of the most recent OHMS versions provide students with hints and explanations (e.g., why a particular answer is incorrect or how a particular question should be answered). A natural extension of this study is to examine the performance effect of an OHMS with and without hints. The research question would be: Does an OHMS with online help and guidance improve student performance as compared to an OHMS without such guidance? Another issue for future research is to examine why the OHMS had no effect on students' exam performance. This lack of an effect may be due to the difference in the format of the examination questions (multiple choice) and the homework (problems).

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APPENDIX. STUDENT SATISFACTION SURVEY

As you answer the following questions, try to think of just this course and this professor. Please do not answer these questions based on your total experience over your entire university career.

1. With regard to fairness and impartiality, The Professor was …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

2. The Professor seemed to be well prepared for class
   a. Almost all of the time
   b. Most of the time
   c. Some of the time
   d. Hardly ever

3. My grades were based on objective standards that were easily understood
   a. Almost all of the time
   b. Most of the time
   c. Some of the time
   d. Hardly ever

4. The Professor was available for outside tutoring and extra instruction
   a. Almost all of the time
   b. Most of the time
   c. Some of the time
   d. Hardly ever

5. When it came to deadlines, The Professor was …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

6. When it came to the workload, the assignments were …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

7. When it came to his expectations of student performance, The Professor was …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

8. My tests and quizzes were …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

9. With regard to group assignments, the requirements were …
   a. Absolutely what I expected
   b. Close to what I expected
   c. Not nearly what I expected
   d. Absolutely not what I expected

10. When it came to course scheduling and roster selection, the course offerings were …
    a. Absolutely what I expected
    b. Close to what I expected
    c. Not nearly what I expected
    d. Absolutely not what I expected

11. Generally speaking, this course was meaningful and useful …?
    a. Almost all of the time
    b. Most of the time
    c. Some of the time
    d. Hardly ever

12. With regard to patience and understanding, The Professor was …
    a. More patient than I expected   c. Not nearly as patient as I expected
    b. About as patient as I expected   d. Absolutely not as patient as I expected

13. Given everything you now know, would you choose this class again?
    a. Absolutely   c. Probably not
    b. Probably   d. Absolutely not

14. Would you recommend this to a close friend or relative?
    a. Absolutely   c. Probably not
    b. Probably   d. Absolutely not

15. Was this class worth the price you paid for it?
    a. Absolutely   c. Probably not
    b. Probably   d. Absolutely not

16. When you enrolled in this class, you had certain expectations. Did this class …?
    a. Exceed your expectations   c. Meet some of your expectations
    b. Meet your expectation   d. Fail to meet your expectations

BETA ALPHA PSI FACULTY ADVISOR PROFILES AND THE INCENTIVES TO SERVE

Stephen Wheeler, Kay C. Carnes and
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ABSTRACT

This chapter examines staffing trends for Beta Alpha Psi (BAP) advisors over the past 20 years to document the degree of tenure- versus nontenure-track faculty involvement. We surveyed faculty advisors to determine how they are compensated for their BAP service. Our findings show a significant increase in the percentage of nontenure-track faculty filling the role of BAP advisor. Additionally, few advisors appear to receive pecuniary benefits for their service, and nearly one-third receive no reimbursement from their institutions for BAP-related expenses that they incur. We discuss the implications of these findings and their potential for limiting BAP's ability to execute future strategic initiatives.

Over 20 years ago, Professor Thomas Burns warned:

Since continuity in a chapter depends to a high degree on a chapter's faculty advisor, such posts are a key variable in a chapter's achievements...despite the fraternity's truly impressive and extensive activities at many levels (chapter, regional, national), the

fraternity continues to have major problems attracting faculty to serve not only as chapter advisors but also at other levels of leadership as well. (Burns, 1988, p. 732)

To date, the issue of how involved tenure-track faculty are in serving Beta Alpha Psi (BAP) has not been addressed empirically. Anecdotal evidence suggests that tenure-track faculty may shy away from advising duties or face burnout when they do accept them. This is an important issue because the ability to achieve many of BAP's strategic initiatives may be negatively affected if institutions lower their commitment to nontenure-track (NTT) faculty and the groups that they advise.

This chapter (1) examines the proportions of tenure-track and NTT faculty serving as BAP advisors over time, (2) chronicles the incentives provided to faculty to serve as advisors to help explain trends in faculty involvement, and (3) assesses advisors' perceptions about their leadership roles. Our findings indicate a marked increase over the past 22 years in the proportions of NTT faculty filling the faculty advisor role in BAP. We also document a general absence of compensation for faculty who fill these positions. We assert that this trend may indicate a systematic decline in commitment by schools to BAP, potentially hindering its ability to fulfill its stated strategic objectives.

The remainder of the chapter is organized as follows. First, we summarize prior literature on BAP, the national trends related to use of NTT faculty, and the employment characteristics of NTT faculty. This is followed by a description of our research methodology. We conclude by summarizing our results and discussing the implications of our findings.

LITERATURE REVIEW AND THEORETICAL ARGUMENTS

Although little has been written in the academic literature concerning BAP (Sheldahl, 1986, p. 1), Emeritus Professor William Stephens (2007, p. 14) provides a recent arm-chair champion's critique and addresses whether the fraternity is still relevant to today's accounting profession. He notes that the organization builds a "bridge" to the future, helps build professional relationships, rewards academic success, and instills a lifelong commitment to professional development, leadership, and ethical behavior. As such, he argues that BAP, "has always been, and will continue to be, an essential element in the preparation of accounting students to take an immediate,

active, and contributing role in the profession and (the) organization(s) they join (Stephens, 2007, p. 13).''

According to BAP, the success of its mission and certain strategic initiatives (BAP, 2009b) depends in part on faculty advisors' abilities and influence. For example, the initiative to ''broaden and enhance recognition by chairs and deans'' shows the organization's concern about its ongoing relations with its host schools. Achieving this initiative presumably depends on the ability of the faculty advisor to lobby chairs and deans for increased recognition of the chapter. In general, tenured faculty should have more influence on this issue. Likewise, BAP's success in increasing ''alumni involvement in regional and annual meetings,'' is largely a function of the faculty advisor's ability to create and maintain long-term relationships with alumni and other professionals. Additionally, BAP seeks to ''increase faculty advisor attendance at regional and national meetings.'' One factor influencing such attendance is an institution's willingness to provide travel funding. Tenure-track faculty normally would have more influence in obtaining these funds than NTT faculty.

The faculty advisor's responsibilities as outlined in BAP Faculty Advisor Manual (BAP, 2009a) include:

> Faculty advisors (FA) are critical to the success of local chapters. In addition to providing counsel and assistance to the chapter, the faculty advisor serves as a liaison between the chapter and the International Chapter as well as between the chapter and the various administrative units of the university.

> Attendance at most or all chapter functions is a part of the faculty advisor's responsibility. ... it is also extremely beneficial to the chapter if you can secure the active support of other faculty members as well.

> The faculty advisor is the only constant from year to year. New officers, new members, and new committee chairs will often need to turn to the FA in order to conduct the activities of the chapter from year to year in a consistent manner.

Presumably, tenure-track faculty would be better liaisons and more effective in promoting faculty involvement in chapter activities than NTT faculty given their departmental and college influence. Likewise, because of the security and long-term commitment that tenure provides, tenured or tenure-track faculty advisors also may promote consistency in chapter operations.

Given the importance of the faculty advisor to BAP's success, it is important to examine the effect of current trends in faculty evaluation and hiring on the motivations and resources of today's faculty advisors. Eaton (2007, p. 21) states that changing attitudes toward the roles of

teaching, research, and service affects accounting faculty workloads, noting that:

> In addition to the teaching component, accounting faculty have traditionally had relatively heavy and somewhat unique service roles. In addition to general service activities such as committee work, faculty meetings and accreditation, many institutions have enjoyed close ties with public accounting firms, companies, and professional organizations such as the AICPA. Accounting faculty at many institutions have frequent informal meetings with these constituencies as well as periodic scheduled meetings with formal advisory boards. Most accounting departments also support BAP and/or other student accounting organizations.

Although service may be a stated requirement for promotion and tenure, its emphasis is often downgraded in favor of greater research efforts. Hermanson (2008, pp. 56, 61) summarizes this trend in an article aimed at helping doctoral students and untenured faculty make decisions that will lead to successful academic careers. He states that academics is a life of "too many competing opportunities, rather than one of trying to figure out how to fill your time" (Hermanson, 2008, p. 61). Hermanson (2008, p. 56) argues that even in institutions that stress teaching as a strategic goal, research drives rewards. Faculty members must carefully protect their time or risk significant overextension, learning to say "no" to opportunities that do not directly lead to promotion. Consequently, fewer faculty may be willing to serve organizations like BAP.

Since the 1970s, The American Association of University Professors (AAUP) has documented the increased reliance on NTT faculty by universities. In 1975, 43 percent of all university faculty held NTT appointments, and 30 percent held part-time appointments (AAUP, 2009a, p. 24). Currently, approximately 68 percent of all university faculty hold NTT appointments, and just over 50 percent hold part-time appointments (AAUP, 2009a, p. 24). The pool of potential BAP advisors also has been negatively affected by the well-documented shortage of accounting faculty (Plumlee, Kachelmeier, Madeo, Pratt, & Krull, 2006, p. 119; Leslie, 2008, p. 7), the increase in the number of accounting students (AICPA, 2008, p. 16), and pressures on deans to run business schools as profit centers (Bailey, 2008, p. 43). All of these factors have increased the use of NTT faculty, and potentially changed the composition of BAP faculty advisors. For example, during the period 1993–2004, the proportion of NTT accounting faculty rose from 59 percent to 62 percent (Leslie, 2009, p. 11). The increased reliance on NTT faculty, the heavy and unique service roles of accounting faculty, and the change in attitudes toward faculty service leads

us to believe that the proportion of NTT faculty advisors in BAP likely has increased over time.

In addition to documenting the increased use of NTT faculty, the AAUP has reported certain employment-related characteristics of NTT faculty that may affect their ability to perform optimally as BAP advisors. For example, the AAUP finds that most institutions make little or no long-term commitment to NTT faculty (AAUP, 2009b). Many faculty classified as "part-time" actually teach the equivalent of a "full-time" course load. To support themselves, "part-time faculty often commute between institutions, prepare courses on a grueling timetable, and make enormous sacrifices to maintain interaction with their students" (AAUP, 2009b). Bergom and Waltman (2009) discuss the lack of respect shown toward NTT faculty. They found that NTT faculty often are made to feel that they are "second tier," or "qualitatively different," and "not really a real professor."

Most interesting and counter-intuitive to conventional wisdom is the AAUP's finding (2009b) that the majority of NTT faculty do *not* have professional careers outside of academe, and most teach basic core courses rather than narrow specialties. While a small percentage of part-time faculty are practicing members of a profession such as law or architecture and teach a class on the side, this situation actually is the exception.

Despite the volumes of data collected and generated by BAP throughout the years, there are no empirical studies about the organization itself. Therefore, this study uses empirical methods to address whether Professor Burns' 20-year-old observation about the difficulty in attracting tenure-track faculty to serve as BAP advisors has come to pass. To complement this analysis, we also surveyed current faculty advisors to assess existing incentive systems for BAP advisors.

METHODOLOGY

First, we collected data to examine changing trends in staffing of BAP advisory roles between 1986 and 2008. Using the 2006 and 2008 online chapter listings on the BAP website (BAP, 2009c) we obtained the names of all faculty advisors for active chapters. To provide a historical comparison, we used copies of chapter listings for 1996 and 1986 from the fraternity's national office to provide faculty advisor names for these years. We then searched the applicable editions of Hasselback's *Accounting Faculty Directory* (2008–2009, 2006–2007, 1996, and 1986) and conducted Internet searches of school websites to determine the faculty ranks of the advisors.

We next conducted an electronic survey of all current faculty advisors to assess their perspectives and to determine whether any incentive systems exist to compensate them for their duties as BAP advisors. Faculty names and e-mail addresses were obtained from the BAP website. We received 141 surveys representing a 53 percent response rate. Eight survey responses skipped at least one question, yielding 133 complete surveys. We inquired about three general areas: (1) demographic information on school size and faculty expertise and experience, (2) faculty perceptions about how their advisor service is valued and what role this service plays in their performance evaluations, and (3) the types of compensation received from their host institutions. The demographic data and faculty perceptions were expected to help in the interpretation of trends in faculty advisor ranks. The compensation information, including direct and indirect monetary compensation (e.g., expense allowance or travel funds), or release time (either teaching or service) was deemed to be a viable means of assessing incentives in place to attract faculty to the advisor role.

RESULTS

Table 1 presents demographic information about respondents, both overall and partitioned by school size as measured by number of undergraduate majors.

Most respondents came from fairly large accounting programs (80 percent with 100 or more undergraduates). Sixty-one percent were tenured or tenure-track, with considerable teaching experience (90 percent had six or more years). Large accounting programs appeared to rely more heavily on NTT faculty for advisory duties, and also reported the highest percentage of faculty with less teaching experience (five years or less). Sixteen percent of respondents were either administrators or served in a dual faculty/ administrator capacity (not shown in Table 1). Over 80 percent of advisors held one or more professional certifications. The majority volunteered to serve in the advisor role, although voluntary status was more prevalent as school size increased. Fifty percent of NTT faculty and over 75 percent of tenured faculty were volunteer advisors (not shown in Table 1).

Only 9 percent of all respondents received any monetary compensation for their services, although this percentage was slightly higher for large schools. The percentage of tenured advisors who receive monetary compensation was only 3 percent (not shown in Table 1). Reported monetary compensation ranged from nominal amounts to a $10,000 annual

Table 1. Demographic Data for Respondents (%).

	Overall	By Size of School (Number of Undergraduate Majors)			
		0–50	51–100	101–200	201+
Tenure status	61% tenured or tenure-track	75	59	62	53
	39% nontenure-track	25	41	38	47
Certification	81% CPA	75	77	82	77
	19% CMA, CIA, CISA, other	75	23	16	19
	17% None	0	23	12	21
Teaching experience	53% (15 years or more)	50	50	51	62
	17% (11–15 years)	25	23	20	11
	20% (6–10 years)	25	23	22	11
	10% (5 years or less)	0	4	7	16
Process of assigning BAP advisor	64% volunteer	25	50	78	62
	36% assigned by department	75	50	22	38
Compensation	9% (monetary compensation)	0	0	6	11
	17% (course release time)	25	14	18	9
	66% (service credit)	0	68	53	62
	68% (travel expenses paid)	25	45	76	62

stipend. Most advisors were rewarded through service credit in performance reviews and/or travel expense reimbursement for attending meetings. Noteworthy is that 32 percent of respondents were not reimbursed for travel by their schools. This places the burden on chapters to fund advisors' travel costs and may discourage advisors from attending BAP sponsored events. This finding also may explain why BAP's strategic plan seeks to increase advisor attendance at regional and national meetings.

Table 2 presents comparisons of faculty advisors by ranks for the four years examined: 1986, 1996, 2006, and 2008.

A χ^2-test of independence (30.11) proved significant ($p < 0.001$), indicating that the yearly actual rank percentages differed from population proportion expectations. The primary cause of the significant overall difference is the marked spike in the proportion of NTT faculty advisors in 2006 and 2008. For years 1986 and 1996, the proportions of NTT advisors were 14 percent and 15 percent, respectively, while in 2006, and 2008, these percentages increased to 25 percent and 32 percent. We partitioned the overall χ^2 statistic to test whether these NTT faculty proportions had significantly changed over time. The results showed that the 1986 to 2008 comparison was significant (18.01, $p < 0.001$), the 1996 to 2006 comparison was significant (6.22, $p < 0.012$), and the 2006 to 2008 comparison was only marginally

Table 2.   Beta Alpha Psi Faculty Advisor Ranks by Year.

Year	Full	Faculty Rank			Total[a]
		Associate	Assistant	NTT	
Panel A					
1986	54 (32%)	53 (31%)	39 (23%)	24 (14%)	170 (100%)
1996	55 (29%)	68 (35%)	40 (21%)	30 (15%)	193 (100%)
2006	67 (24%)	90 (32%)	52 (19%)	70 (25%)	279 (100%)
2008	64 (23%)	82 (30%)	40 (15%)	88 (32%)	274 (100%)
			χ^2		*p*-Value
Panel B: Partitioned χ^2 comparisons (tenure-track vs. nontenure-track) by year					
1986 (14%) vs. 2008 (32%)			18.01		.001
1986 (14%) vs. 1996 (15%)			0.15		.703
1996 (15%) vs. 2006 (25%)			6.22		.013
2006 (25%) vs. 2008 (32%)			3.34		.067

[a]χ^2-test of four-year proportional differences in ranks (9 d.f.) = 30.11, $p < 0.001$.

significant (3.34, $p < 0.067$). These results indicate that the proportion of NTT faculty serving as BAP advisors has risen significantly over the past 20 years.

The survey also asked faculty advisors about their perceptions of service in three specific areas: personal and professional benefits of BAP service, value of BAP perceived by peers and superiors, and BAP service compensation. Table 3 presents a tabulation of these responses.

Five of the nine questions produced means significantly ($p \leq 0.05$) different from a response that neither agreed nor disagreed with the question. The results suggest that advisors benefit from better professional contacts and consider BAP service to be a joyful experience. However, responses to questions 6, 7, and 8 indicate that advisors did not believe that their efforts were instrumental in either their annual salary determinations or their efforts to obtain tenure, and that the BAP advisor duties actually adversely affected their performance of other duties such as research and teaching.

DISCUSSION AND IMPLICATIONS

In this chapter, we look at trends in ranks of faculty advisors across a 22-year period. Archival results show a marked decrease in the proportions

Table 3. Perceptions of Beta Alpha Advisor Role.

	(1) Strongly Agree (%)	(2) Agree (%)	(3) Neither Agree Nor Disagree (%)	(4) Disagree (%)	(5) Strongly Disagree (%)	Mean	*n*
1. Valued by superiors	4	49	23	16	10	2.78	129
2. Valued by peers	5	41	28	18	8	2.82	131
3. Aids in keeping current with professional standards	4	31	34	12	19	3.10	130
4. Better connected with profession	33	46	14	5	2	1.97*	130
5. Brings me joy	32	49	14	3	3	1.97*	132
6. Instrumental in annual salary determination	1	12	21	18	48	4.01*	122
7. Valuable in obtaining tenure	0	12	28	22	39	3.88*	120
8. Decrease in my abilities in other professional duties (e.g., teaching, research)	24	36	21	16	4	2.39*	132
9. BAP advisors should be compensated monetarily	22	24	27	22	5	2.62	130

*t-test shows mean significantly different from 3.0 at $p \leq 0.05$.

of tenure-track faculty serving in faculty advisor roles over time. These proportions have not only increased over the long term but also continue to increase in recent years. Therefore, it appears that Professor Burns' 1988 observation concerning the trends in attracting tenure-track faculty to serve the organization appears to have come to pass.

The increase in the proportion of NTT faculty advisors over time seems to mirror recent trends across all of academe. This growth is troubling given the documented employment-related characteristics of NTT faculty that may make it more difficult for them to help meet the stated strategic initiatives of BAP. For example, one faculty advisor role is to serve as a liaison between the chapter and the university administration to, ''broaden and enhance recognition by chairs and deans.'' However, research shows that only 46 percent of universities allow full-time NTT faculty to

participate fully in department or unit-level governance, and only 23 percent allow part-time NTT faculty to participate (August, Hollenshead, Miller, & Waltman, 2006, p. 43). Because NTT faculty advisors are less likely to have a role in faculty governance, they may be less able to effectively lobby deans and department chairs for support and recognition. This may explain why only 9 percent of this study's respondents report receiving monetary compensation, although 46 percent favor such compensation for advising duties. It also may be why nearly one-third of all respondents are not reimbursed by their institutions for travel and other expenses associated with faculty advisor duties.

Given that only 52 percent of all universities and only 38 percent of undergraduate universities offer long-term contracts to NTT faculty, it is likely more difficult for NTT faculty to be able to create and maintain the kind of long-term relationships with alumni that are necessary to increase alumni involvement, a strategic initiative of BAP. In fact, the increase in NTT faculty advisors over the past twenty years may explain the current BAP focus on building alumni involvement.

High turnover rates and the lack of long-term contracts for NTT also potentially hinder the continuity of leadership at the individual chapter level. For example, if a tenure-track faculty member relinquishes the role of faculty advisor to another faculty member, it is likely that the former advisor will still be employed by the university and will be available to assist the new advisor during the turnover period. This smooth transition may not occur when NTT faculty advisors relinquish their duties upon leaving an institution.

NTT faculty advisors also may be less likely to teach the upper level classes occupied by BAP students, thus making it more difficult for them to engage students in the organization's activities. Additionally, tenure-track faculty perceptions of NTT advisors as ''second tier'' can jeopardize interactions of faculty with BAP. While 46 percent of survey respondents report that BAP service enhances their connection to the accounting profession, this connection is less permanent for NTT faculty advisors given their potential mobility.

Survey results also show that the typical BAP advisor might be described as a highly experienced, professionally licensed academic from a large school who volunteered for the position and who is largely uncompensated monetarily for his/her efforts. Further, serving as faculty advisor is not seen as instrumental in obtaining tenure or additional raises. Nevertheless, advisors consider their efforts as valued and a source of job satisfaction and professional connectivity.

LIMITATIONS

This study suffers from several limitations. First, the partitioning of the demographic information by school size used only data from survey respondents and hence may not generalize to the entire population of faculty advisors. Second, the interpretation of faculty-rank findings is in no way intended to imply anything about the quality of NTT faculty themselves. Instead, this study simply suggests that the conditions under which NTT faculty are typically employed may make it more difficult to function effectively in their roles with BAP.

CONCLUSION

BAP has been and continues to be a valuable bridge organization to the financial and information professions. To those who serve the organization, this study's compensation findings may not be surprising given that their service is done largely as a labor of love. On one hand, the lack of advisor compensation and the shift away from tenure-track advisors may indicate a decline in the perceived value of BAP by business schools. On the other hand, BAP chapters may have become so adept at "going it alone" without much school support that they have exacerbated this decline in commitment. Interestingly, when a school petitions to become a new chapter, a national board representative conducts a site visit to assess the petitioning school's viability. The site visit includes a meeting with the school's administration to judge the institutional commitment to the chapter. However, once installed, there is no continuing assessment of this institutional support. Given the findings of this study, perhaps BAP should consider adding assessment metrics of institutional commitment to its ongoing reporting activities. Such measures might address the following: (1) the advisor's rank, (2) method by which the advisor is compensated for BAP service, (3) evaluation of advisor access to an institution's administrators, deans, and chairs, and (4) assessment of advisor participation in faculty governance. Such measures would better focus the national BAP organization and host institutions on the nature and importance of the BAP faculty advisor role.

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AN EXAMINATION OF THE LINKS BETWEEN SRS TECHNOLOGY AND AN ACTIVE LEARNING ENVIRONMENT IN A MANAGERIAL ACCOUNTING COURSE

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ABSTRACT

Over the past two decades there has been a concerted effort to move accounting education from a knowledge-oriented system to a process-oriented approach. Active learning is an internationally recognized cornerstone of this strategy. A new technology offers opportunities for professors to promote active learning in their classrooms. That technology frequently called student response systems (SRSs) enable students to answer questions posed by an instructor via a remote control device. This study examines the impact that a new technology, SRS, had on students' perceptions of key active learning characteristics. The results suggest that students receiving an SRS treatment registered significantly stronger agreement with statements describing an active learning environment than their peers in a control group. The results led to the conclusion that

SRSs can be used to facilitate active learning in accounting classrooms. The survey also examined the impact of the SRS treatment on student perceptions regarding classroom efficiency. Students receiving the SRS treatment registered stronger agreement with statements suggesting that the learning environment was efficient. In summary, the survey results suggest that SRS technology is a promising teaching tool that deserves further scrutiny by accounting educators.

Significant developments in classroom technology have been made during the last decade. Advances in computer hardware, projection equipment, and presentation software have allowed instructors to more effectively deliver content to students. Unfortunately, the focus has been one sided, instructor to student. Communication from student to instructor has not benefited as much from these developments. A new technology, known as a student response system (SRS), goes beyond content delivery.

SRSs enable students to answer questions posed by an instructor via a remote control device. All students in a class can respond simultaneously on a real-time basis. Responses can be captured and displayed to the class at the will of the instructor, thereby allowing immediate feedback for both instructor and students. Further, the captured responses can be automatically graded by the SRS software and made available to other programs for assessment purposes.

Active learning is highly relevant to accounting educators. Over the past two decades there has been a concerted effort to move accounting education from a knowledge-oriented system to a process-oriented approach (Albrecht & Sack, 2000, pp. 1–4; Sundem, 1999, Chap. 5; Sundem & Williams, 1992, pp. 55–56). Active learning is an internationally recognized cornerstone of this strategy (Lucus, 1997, pp. 189–190).

Active learning is a common term that encompasses a broad range of ideas about various aspects of learning. This study utilizes Bonwell and Eison's (1991, pp. 1–4) definition of the term. The study examines student opinion data to determine how an SRS treatment affected active learning in an introductory managerial accounting course.

The remainder of the chapter is organized as follows. We describe SRS technology and show how it relates to active learning. The research hypotheses are developed. We describe the research approach. Then we display the empirical results of the hypothesis tests. Finally, we discuss the implications of the results on accounting education.

PRIOR SRS RESEARCH

Research on SRS technology started in the late 1960s. The first systems consisted simply of an overhead projector and index cards. Harden, Wayne, and Donald (1968, pp. 29–32) gave students several colored index cards, each one representing a different response. They would pose a question on an overhead projector and students would respond by raising one of their index cards. They would then pace the lecture based on the student responses. During the same time period the University of Glasgow introduced an electronic system. The system hard-wired 128 student stations to an instructor's console. The instructor posed questions that the students answered by selecting one of the four switches at their station (Dunn, 1969, pp. 21–22). To our knowledge, no research was published testing how SRS systems affected student perceptions of the learning environment. This research stream was not continued because of the great cost in implementing a hard-wired system.

SRS research was revived during the late 1990s with the introduction of cost-effective wireless SRSs. Recently, there has been considerable research on the implementation of these systems (Elliott, 2003, pp. 80–86; Hall, Waitz, Brodeur, Soderholm, & Nasr, 2002, pp. 9–15; Burnstein & Lederman, 2001, pp. 8–11). This research covers the implementation of SRS technology into economics, physics, and engineering classrooms. Edmonds and Edmonds (2008, pp. 421–433) reported empirical evidence that SRS technology had a positive effect on student performance as measured by grades the students earned on a series of examinations administered in an introductory managerial accounting course. The researchers theoretically linked the SRS technology employed in their study to active learning but the linkage was not empirically tested. The primary objective of this study is to test the potential links between SRS technology and active learning as measured by student perceptions.

ACTIVE LEARNING AND SRS TECHNOLOGY

Bonwell and Eison (1991, pp. 1–21) associate active learning with the following seven characteristics: (1) students are involved in more than passive listening; (2) students are engaged in activities; (3) there is less emphasis placed on information transmission and greater emphasis placed on developing skills; (4) there is greater emphasis placed on the exploration of attitudes and values; (5) students can receive immediate feedback from

their instructor; (6) student motivation is increased; and (7) students are involved in higher order thinking. The primary focus of this study is to test the capacity of an SRS system to satisfy characteristics (1), (2), (3), (5), and (6).

Primary Considerations

SRS technology enables two-way communication between the student and the instructor. More specifically, students communicate with the instructor using wireless response pads. The instructor can pose questions to the class and receive an immediate student response. Every time a student responds, active learning characteristics (1) and (2) are satisfied.

SRSs motivate information exchange between students. For example, students may be asked to join groups that seek consensus when SRS data indicate diverse responses to an instructor query. Verbal communication and team building skills are promoted as students strive to explain and justify their answers. This condition satisfies active learning characteristic (3).

SRS technology provides immediate student response feedback. When students respond to a question, the SRS server compiles all responses and displays class performance statistics. The results inform the student not only as to whether they answered the question correctly but also as to how well they are performing in relation to their peers. This immediate feedback satisfies active learning characteristic (5).

SRS technology enables the instructor to monitor student attendance, participation, and accuracy on a real-time basis. SRS proponents claim that these features motivate students to attend class, to show up on time, and to pay attention during class (Birdsall, 2002, p. 3; Draper, Clargill, & Cutts, 2002, pp. 13–23). An increase in student motivation satisfies active learning characteristic (6).

Certain applications of SRS technology could be linked to active learning characteristics (4) and (7). For example, SRSs could motivate students to exchange information about their attitudes and values thereby satisfying characteristic (4). We did not test such possible links because the content of the course wherein the experiment was conducted did not lend itself to the development of appropriate hypotheses. Even so, evidence associated with Bonwell and Eison's (1991, pp. 1–21) other characteristics provides insight into the capacity of SRS technology to stimulate an active learning environment.

Secondary Considerations

SRS proponents argue that the technology enables a more efficient learning environment. The real-time student feedback enables the instructor to focus on the areas where students need help. For example, an instructor could set the lecture pace by posing questions on a particular concept just taught and then use SRS technology to assess student comprehension. If the SRS results indicate that most of the students understand the concept, the instructor would proceed to a new concept. If the SRS results show that many of the students do not understand the concept, the instructor may spend additional time reviewing the concept. These arguments suggest that students in an SRS setting would feel they impacted the pace of the lecture and that the instructor was consistently focused on the subject. The study tested for these expected effects.

DEVELOPMENT OF HYPOTHESIS

To test the expected links between SRSs and active learning we establish the following hypotheses. Bonwell and Eison's (1991, pp. 1–21) characteristics (1) and (2) overlap significantly when placed into practice. For example, any activity other than only listening satisfies both characteristics (1) and (2) simultaneously. As a result, we establish one hypothesis to test the expected link between SRSs and student involvement in classroom activities [Bonwell and Eison's characteristics (1) and (2)].

H1. Students experiencing the SRS treatment will register stronger agreement with statements indicating they were actively engaged in the learning process than students in the control group.

The second hypothesis tests the expected link between SRSs and skill development [Bonwell and Eison's characteristic (3)].

H2. Students experiencing the SRS treatment will register stronger agreement with statements indicating they were involved in activities leading to the development of communication and team building skills than students in the control group.

The third hypothesis tests the expected link between SRSs and feedback [Bonwell and Eison's characteristic (5)].

H3. Students experiencing the SRS treatment will register stronger agreement with statements indicating they received meaningful feedback than students in the control group.

The fourth hypothesis tests the expected link between SRSs and motivation [Bonwell and Eison's characteristic (6)].

H4. Students experiencing the SRS treatment will register stronger agreement with statements indicating they were motivated than students in the control group.

The fifth hypothesis tests the expected link between SRSs and learning efficiency.

H5. Students experiencing the SRS treatment will register stronger agreement with statements indicating the learning environment was efficient than students in the control group.

RESEARCH APPROACH

To test the hypotheses, survey data were collected from students enrolled in two introductory managerial accounting courses that were offered in the fall semester at a mid-size AACSB accredited urban university. SRS technology was introduced as a routine approach in the experimental group. Both classes were taught by the same professor. Both classes met for 1 h and 15 min two times per week. The same syllabus, course content, homework, and tests were used in the classes.

Instruction was administered via brief lectures that were interspersed with short multiple-choice questions. More specifically, relevant questions were administered immediately after related topics were discussed. The same questions were used for both SRS and non-SRS groups. The questions were displayed on a screen using computer projection equipment. Students were encouraged to answer questions through the implementation of a bonus system.

Students in the SRS group answered all the questions electronically by entering data through SRS remote control devices. Student in the non-SRS group recorded answers on a sheet of paper. Answers to selected questions were taken up randomly by the instructor. Student responses were collected before the correct answer was disclosed. The collection process was time consuming and somewhat disruptive. However, the process was manageable because the instructor rarely collected more than one question per class.

Both the SRS and non-SRS groups were assigned bonus points on a pass/fail basis. Students in the SRS group were required to answer 60 percent of the questions correctly to earn the bonus points. Students in the non-SRS group were required to answer 60 percent of the questions that were collected correctly to obtain the bonus points. In the treatment group, the SRS graded all questions that were asked in class (five or six per class). In contrast, the manual approach applied in the non-SRS group limited the number of questions graded to the question that was taken up by the instructor. Given the class size of 67 students, collection and grading process was burdensome even when collection was limited to a single question per class.

In the SRS group the answer along with summary results of the students' answers were provided instantaneously through the SRS system. Students and the instructor were able to see the distribution of responses for each question immediately after the answers were submitted. Answers were provided to the control group students verbally by the instructor. There was no opportunity for the instructor or the students to know how many students answered the questions correctly during the class. The instructor graded the take-up question after class. Table 1 summarizes the differences in the SRS experimental group and the non-SRS control group created by the implementation of SRS technology.

Survey Instrument

A survey instrument was administered to the control and experimental groups on the last day of class. The instrument contained 50 brief statements listed on a single sheet of paper. Students were asked to register their agreement with each statement by selecting a number on a five-point Likert scale with 1 indicating strong disagreement and 5 indicating strong agreement. Two versions of the instrument were developed by displaying the statements in a different order on the page. Duplication and reverse logic were also used as control measures. Two statements were repeated with exact language, two statements had closely worded proxy duplicates, and one statement had a corresponding counter statement.

Three questions had significant differences (at $\alpha = .1$) in the responses provided on the two different versions of the survey. However, for all three questions, the direction of the effect was the same for both versions of the survey. While a slight ordering effect was detected, the effect did not

Table 1. Implementation of SRS – Differences in the Experimental Group and Control Group.

	SRS Classes	Non-SRS Classes
Actively engaged	The professor asked the students to answer/work five to six problems per class.	The professor asked the students to answer/work five to six problems per class.
Student response	Students responded to almost every question.	Since only the one problem in each class was graded, it is perceived that not all of the students answered/worked all of the problems.
Assessment	Students were assessed on every question answered.	Students were assessed on only one question selected randomly during each class.
Feedback	The answers were supplied immediately after each answered question. Results were displayed on an overhead projector. Students were supplied with the correct answer as well as summary class statistics.	The answers were supplied verbally after each question. The students received no summary statistics on class performance.
Lecture pace	The lecture pace was adjusted on a real time basis when assessment showed that students did not understand a concept.	The lecture pace was not adjusted.

change the direction of student's responses, and therefore, should not impact the results.

There were no significant differences in the responses for the duplicate questions or proxy questions for either the control group or the experimental group. The reverse logic question produced significant differences in the expected direction. These findings indicate that the students were exercising due diligence when completing the survey.

SURVEY RESULTS

The survey results are shown in tables that relate specific survey statements to each hypothesis. There were 88 students registered for non-SRS class; and 51 students registered for the SRS class. Sixty-seven students in the non-SRS class and 43 students in the SRS class completed the survey. While the survey instrument contained 50 statements, only 45 were used. The results

for five statements were discarded because they were not linked to the hypotheses tested in the study.

We used a folded *f*-test to compare variances of the two group means. If the variances were not significantly different (at $\alpha = .1$), we used the pooled *t*-test, otherwise we used the Satterthwaite *t*-test. The statement results receiving the pooled *t*-test are designated with a lower case "p" in the column titled "type" in the tables showing the statistics. Those receiving the Satterthwaite *t*-test are designated with a lower case "s" in the "type" column. When interpreting the results, we used a *p*-value of .1. However, the actual *p*-values are shown in the tables so that the reader can adjust interpretations as he or she deems appropriate.

Perceptions Related to Hypothesis 1

The differences in the mean scores for the statements related to perceptions of active engagement in the learning process (Hypothesis 1) are shown in Table 2.

Students receiving the SRS treatment registered stronger agreement with statements indicating that they were challenged during class (Table 2, item nos. 1 and 2) and that they were actively involved/engaged in the learning environment (Table 2, item nos. 3–5).

Some readers may view the results for items 6 and 7 as conflicting. While the non-SRS group expressed stronger agreement that their "primary purpose in going to class was to take notes" (Table 2, item no. 7), the SRS group registered stronger agreement with the statement that they "watched the instructor work exercises and problems" (Table 2, item no. 6). To the contrary, we believe these results are consistent. The SRS treatment not only stimulated active involvement in working exercises and problems but also in motivating the students to pay attention when the instructor worked them. This conclusion is supported by the results related to some of the statements shown in the Hypothesis 4 section of the chapter. Specifically, students in the SRS group reported stronger agreement with statements related to paying attention (Table 5, item nos. 5 and 9). In summary, the non-SRS students were more likely to perceive themselves as passive listeners and note takers while the SRS students had stronger perceptions of themselves as being actively engaged in working exercises and problems. Therefore, the data in Table 2 provide strong support for the acceptance of Hypothesis 1.

Table 2. Results Associated With Hypothesis 1.

Item	Survey Question	Non-SRS Classroom		SRS Classroom		Predicted Sign	Comparison			
		n	Mean	*n*	Mean		Mean difference	*t*-value	Type	*p*-value[a]
1	I was challenged to learn during class.	67	3.76	43	4.4	−	−0.64	−3.82	s	0.0002
2	I was challenged to learn during class (duplicate statement see item 1 above).	67	3.85	43	4.33	−	−0.48	−3.11	s	0.0024
3	I was actively involved in the learning experience during class.	67	3.57	43	4.05	−	−0.48	−2.85	s	0.0052
4	I was actively engaged in the learning process during class (proxy statement see item 4 above).	66	3.53	43	4.14	−	−0.61	−3.53	s	0.0006
5	I worked exercises and problems in class.	66	4.00	43	4.58	−	−0.58	−4.32	s	<0.0001
6	I watched the instructor work exercises and problems in class.	66	4.35	43	4.65	−	−0.3	−2.69	s	0.0082
7	My primary purpose in going to class was to take notes.	65	3.75	42	3.38	−	0.37	1.71	p	0.0909

[a]All *p*-values reported are based on two-tailed tests.

Perceptions Related to Hypothesis 2

The differences in the mean scores for the statements related to perceptions of the development of communication and team building skills (Hypothesis 2) are shown in Table 3.

Students experiencing the SRS treatment registered stronger agreement with the statement that the instructor encouraged students to work together (Table 3, item no. 1). The mean differences regarding cooperation and competitiveness were not significant (Table 3, item nos. 2 and 3). Likewise the mean differences for the tests to measure whether the SRS group was more likely to perceive themselves as giving and receiving help to and from their fellow students (Table 3, item nos. 4–7) were not significant. While students perceived the instructor as making effort to encourage team building, the other measures found no evidence that SRS affected the perceptions regarding cooperation and competitiveness or in the giving and receiving help. We conclude that the data in Table 3 do not provide support for Hypothesis 2.

Perceptions Related to Hypothesis 3

The differences in the mean scores for the statements related to perceptions of receiving meaningful feedback (Hypothesis 3) are shown in Table 4.

Students receiving the SRS treatment registered stronger agreement with statements indicating that they received feedback and that they got it in time to prepare for exams (Table 4, item nos. 1–3). The difference on item 2 was unexpected because there would be time to go back and cover confusing topics based on the grading of questions in the non-SRS group. This suggests that, once lost, the opportunity to clarify is unlikely to occur.

The non-SRS group registered stronger agreement with the statement that they knew when their fellow students were confused (Table 4, item no. 4). The mean response for the statement that they knew how their performance compared to that of their fellow students was higher for the SRS group, but the difference was not significant (Table 4, item no. 5). These perceptions are inconsistent with reality. The SRS group received regular and consistent feedback about their peers that was not available to the non-SRS group. Perhaps, the non-SRS group is over confident in their ability to judge their peers because they have limited or no feedback regarding the issue. In contrast, the SRS group has had to face the fact that the results reported via

Table 3. Results Associated With Hypothesis 2.

Item	Survey Question	Non-SRS Classroom		SRS Classroom		Predicted Sign	Comparison			
		n	Mean	*n*	Mean		Mean difference	*t*-value	Type	*p*-value[a]
1	The instructor encouraged students to work together to solve difficult problems.	67	3.54	42	4.19	−	−0.65	−3.59	s	0.0005
2	Students in this class were cooperative.	67	3.73	43	3.93	−	−0.2	−1.30	p	0.1955
3	Students in this class were competitive.	67	3.16	43	3.26	−	−0.1	−0.48	p	0.6293
4	Other students helped me to understand a difficult concept.	66	3.44	43	3.49	−	−0.05	−0.22	p	0.8256
5	When I was confused, I sought help from my fellow students.	67	3.49	43	3.79	−	−0.3	−1.32	p	0.1889
6	I helped other students to understand a difficult concept.	66	3.17	43	3.30	−	−0.13	−0.61	p	0.5438
7	I felt confident in giving advice to my fellow students.	66	3.38	42	3.62	−	−0.24	−1.15	s	0.2525

[a]All *p*-values reported are based on two-tailed tests.

Table 4. Results Associated With Hypothesis 3.

Item	Survey Question	Non-SRS Classroom		SRS Classroom		Predicted Sign	Comparison			
		n	Mean	*n*	Mean		Mean difference	*t*-value	Type	*p*-value[a]
1	I received feedback in time to use it in preparing for exams.	67	4.21	43	4.47	−	−0.26	−2.06	p	0.0419
2	I was able to obtain feedback during class about issues that confused me.	67	3.81	43	4.4	−	−0.59	−3.91	s	0.0002
3	I received adequate feedback about my understanding of the course content during class.	66	3.59	42	4.1	−	−0.51	−3.34	s	0.0012
4	I knew when my fellow students were confused.	65	3.92	41	3.37	−	0.55	2.91	p	0.0045
5	I knew how my performance compared to that of my fellow students.	65	3.40	43	3.49	−	−0.09	−0.46	p	0.6450
6	When I was confused, I waited until I got home and straightened out the confusion on my own.	67	3.55	42	2.76	+	0.79	3.46	p	0.0008
7	There was regular two way communication between the students and instructor during class.	66	3.89	43	3.93	−	−0.04	−0.24	p	0.8127

[a]All *p*-values reported are based on two-tailed tests.

Table 5. Results Associated With Hypothesis 4.

Item	Survey Question	Non-SRS Classroom		SRS Classroom		Predicted Sign	Comparison			
		n	Mean	n	Mean		Mean difference	t-value	Type	p-value[a]
1	I find it easy to be motivated for required classes.	67	3.67	43	3.56	?	0.11	0.49	p	0.6224
2	I was motivated to attend this class.	67	3.81	42	4.29	−	−0.48	−2.73	s	0.0074
3	I was not motivated to attend this class (reverse logic see item 2 above).	65	2.86	43	2.05	−	0.81	3.36	p	0.0011
4	This class taught me the importance of coming to class.	66	3.77	43	4.12	−	−0.35	−1.80	s	0.0743
5	The topic of this class is interesting to me.	65	3.35	43	3.72	−	−0.37	−1.56	p	0.1213
6	It was difficult to stay awake in this class.	65	2.97	43	1.81	+	1.16	5.41	s	<0.0001
7	I frequently found my attention drifting to non class related subjects during class.	67	3.39	43	2.3	+	1.09	5.64	p	<0.0001
8	This class taught me the importance of paying attention during class.	67	3.85	43	4.14	−	−0.29	−1.72	s	0.0882
9	I was motivated to pay attention during class.	67	3.70	43	4.28	−	−0.58	−3.77	s	0.0003

10	Recording attendance motivated me to attend class.	66	4.02	43	4.30	–	−0.28	−1.85	s	0.0667
11	I was motivated to be on time for this class.	67	3.66	43	4.26	–	−0.6	−3.59	s	0.0005
12	This class taught me the importance of arriving on time (proxy statement see item 11 above).	67	3.46	43	4.02	–	−0.56	−2.82	p	0.0057
13	Student interactions with the professor during class motivated me to attend.	65	3.09	43	3.81	–	−0.72	−4.11	s	<0.0001
14	I needed to do my best work to be successful in this class.	65	4.09	43	4.14	–	−0.05	−0.29	p	0.7752
15	I was motivated to do my best work in this class.	66	3.73	43	4.14	–	−0.41	−2.34	p	0.0210

[a]All p-values reported are based on two-tailed tests.

the SRS were inconsistent with their original perceptions and therefore grew less confident in their ability to assess peer performance.

Interestingly, the SRS group perceived themselves as less likely to wait until they got home to resolve confusion (Table 4, item no. 6). However, there was no significant difference in how the two groups perceived help from their peers (Table 3, item nos. 4 and 5) or in the level of two-way communication with the instructor (Table 4, item no. 7). This raises the question, if the SRS group did not perceive a significant difference in getting help from their peers or communication with their instructor, what was the source of in-class help (Table 4, item no. 6)? One logical explanation is that the feedback received from the SRS provided sufficient insight to clear their confusion. In summary, we concluded that the data in Table 3 provide strong support for the acceptance of Hypothesis 3.

Perceptions Related to Hypothesis 4

The differences in the mean scores for the statements related to perceptions of motivation (Hypothesis 4) are shown in Table 5.

There was no significant difference in how the non-SRS and the SRS groups perceive their motivation to take required courses (Table 5, item no. 1). Even so, the SRS group registered higher agreement with statements that they were motivated to attend this required course (Table 5, item nos. 2–4). Further, the SRS group responses suggest stronger interest and less distraction (Table 5, item nos. 6–9).

The SRS group registered stronger agreement with the statement that taking attendance motivated them to attend class (Table 5, item no. 10). The SRS system provides unique features that may explain this result. For example, the SRS makes attendance taking visual and instantaneous. Students see their number light up when they click into class. The data suggest that these SRS features contribute to the motivation to attend class.

The SRS group expressed even stronger agreement with the statement regarding the importance of being on time (Table 5, item nos. 11 and 12). This result suggests the SRS feature that enables the instructor to take attendance at the start of class, motivates students to attend class, and to be on time.

The SRS group registered stronger agreement with the statement that interaction with the professor during class motivated attendance (Table 5, item no. 13). However, there was no significant difference in how the two groups perceived the level of regular two-way communication between the students and the instructor (Table 4, item no. 7). This result suggests that the

factor motivating attendance stems from the information exchange functions provided through the SRS system rather than one-on-one communication between the instructor and individual students.

While the mean scores suggest that both groups recognized hard work as necessary for success in the class (Table 5, item no. 14), students in the SRS group were more motivated to do the work (Table 5, item no. 15). In summary, the data in Table 5 provide strong support for the acceptance of Hypothesis 4.

Perceptions Related to Hypothesis 5

The differences in the mean scores for the statements related to perceptions of learning environment efficiency (Hypothesis 5) are shown in Table 6.

The SRS group had a stronger perception that class time was spent efficiently (Table 6, item no. 1). The SRS group was more likely to perceive the instructor as knowing when the class was confused and focusing attention where it was needed (Table 6, item no. 2). The SRS group registered stronger agreement with statements indicating that the instructor stayed on the subject (Table 6, item nos. 3 and 4). While there was no significant difference in how the two groups perceived the influence of student interaction on course content (Table 6, item no. 5), the SRS group did register stronger agreement with the statement that the pace of the lecture was influenced by student interaction and understanding (Table 6, item nos. 6 and 7). Finally, the SRS group held stronger perceptions that the instructor resolved students' questions during class (Table 6, item nos. 8 and 9). In summary, the data in Table 6 provide strong support for the acceptance of Hypothesis 5.

These results are consistent with reality. The instructor did alter the pace and focus of the lectures in response to the student feedback reported through the SRS. The research findings show that students recognize the instructor's real-time modifications and that they believe the class time is spent more efficiently when the instruction is delivered in this fashion.

CONCLUSION

Active learning is widely recognized as a teaching methodology that is beneficial in moving the accounting discipline from a knowledge-oriented

Table 6. Results Associated With Hypothesis 5.

Item	Survey Question	Non-SRS Classroom		SRS Classroom		Predicted Sign	Comparison			
		n	Mean	n	Mean		Mean difference	t-value	Type	p-value[a]
1	Class time was spent efficiently.	67	4.10	43	4.56	−	−0.46	−2.91	p	0.0044
2	The instructor knew when the class was confused and focused attention where it was needed most.	67	3.73	42	4.26	−	−0.53	−3.37	s	0.0011
3	The instructor frequently drifted into unrelated topics.	67	2.34	42	1.62	+	0.72	3.58	p	0.0005
4	The instructor deviated from the topic scheduled to be discussed in class.	67	2.90	43	2.4	+	0.50	1.99	p	0.0490
5	The content of the lecture was influenced by student interaction with the instructor.	66	3.47	43	3.72	−	−0.25	−1.48	s	0.1416
6	The pace of the lecture was influenced by student interaction with the instructor.	66	3.68	43	4.02	−	−0.34	−2.17	s	0.0322
7	The pace of the lecture was influenced by student understanding of the material.	66	3.58	43	4.02	−	−0.44	−2.61	s	0.0103
8	The instructor responded to student comments during class.	65	4.25	43	4.51	−	−0.26	−2.36	s	0.0203
9	The instructor responded to student comments during class (duplicate statement see item 8).	67	4.24	43	4.51	−	−0.27	−2.46	s	0.0156

[a]All p-values reported are based on two-tailed tests.

system to a process-oriented approach. The findings of this study suggest that the implementation of an SRS in an introductory managerial accounting course significantly impacted student perceptions of their learning environment. Students receiving an SRS treatment registered significantly stronger agreement with statements that they were actively involved in the learning process (Hypothesis 1); that they received helpful feedback (Hypothesis 3); and that they were motivated to attend class, to be on time, and to pay attention during class (Hypothesis 4). The tests found no statistically significant evidence that SRS affected student perceptions related to giving and receiving help (Hypothesis 2).

Previous research has found associations between SRSs and student performance measures. One plausible explanation is that SRS motivate certain learning behaviors. For example, this study found students receiving the SRS treatment perceived class attendance, tardiness, and paying attention as being more important than did the non-SRS group (Hypothesis 5).

Overall these findings suggest that the SRS approach used in this study satisfied key characteristics of an active learning environment as described by Bonwell and Eison (1991, pp. 1–4). We therefore conclude that SRSs can be used to promote an active learning environment.

A secondary objective of this study was to test the impact of the SRS on the efficiency of the learning environment. The data suggest that the SRS did impact students' perceptions regarding the efficiency of the learning environment. Students receiving the SRS treatment registered stronger agreement with statements suggesting that the instructor was efficient; that the instructor knew when students were confused and took appropriate action; and that the instructor stayed on subject. These findings lead us to conclude that SRS technology facilitates the perception of an effective learning environment (Hypothesis 5).

SRS technology can be implemented in a variety of different formats. For example, student response data could be used as a course requirement instead of a bonus as implemented in this study. Future research that examines the way implementation impacts perceptions would be useful to educators. Further, we recommend additional research that examines performance measures such as exam scores, absenteeism, or drop rates as opposed to student perceptions. In the final analysis, we conclude SRSs to be a very promising teaching tool that deserves further scrutiny by accounting educators.

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ACCOUNTING DOCTORAL PROGRAMS: A MULTIDIMENSIONAL DESCRIPTION

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ABSTRACT

Accounting doctoral programs have been ranked in the past based on publishing productivity and graduate placement. This chapter provides descriptions of accounting doctoral programs on a wider range of characteristics. These results may be particularly useful to doctoral applicants as well as to doctoral program directors, accreditation bodies, and search committees looking to differentiate or benchmark programs. They also provide insight into the current shortage of accounting doctoral graduates and future areas of research.

Doctoral programs can be differentiated on more variables than just research productivity and initial placement. Doctoral programs vary widely with respect to the following characteristics: the rate at which doctorates are conferred on women and minorities, the placement of graduates according to Carnegie classification, AACSB accreditation, the highest degree awarded by employing institution (bachelors, masters, doctorate),

the extent to which graduates leave the USA, work in industry, are
appointed to administrative positions, and hold endowed positions.

Accounting doctoral programs are often evaluated and ranked based on
various measures of publishing productivity, both of graduates and of
faculty. While publishing is very important in academia, the choice to attend
a PhD program is complex. In addition, the variables that can give insight
into a PhD program and its graduates are far more diverse than simply the
research productivity of a program's faculty and graduates.

The purpose of this investigation is to describe and analyze U.S. doctoral
accounting programs using a variety of demographic data about the
programs and their most recent graduates. This demographic information
(including graduate gender and minority status, placement, etc.) may be
particularly useful to doctoral applicants as well as to doctoral program
directors or search committees looking to differentiate or benchmark
programs. This study addresses the following broad research questions:
What are the demographic characteristics of the graduates of each program,
including gender and minority status? What are the demographic
descriptors of each program's graduates with regard to current employment
situations, including institutional classification, accreditation, and highest
accounting degree conferred by the employing department (bachelors,
masters, doctorate)? To what extent are each program's graduates
appointed to administrative and endowed positions? To what extent do
each program's graduates leave academia or leave the USA?

PRIOR RESEARCH

The literature describing accounting doctoral programs is mostly comprised
of various studies ranking programs on publishing output of faculty and/or
graduates or on initial placement of graduates. The publishing productivity
studies that rank accounting doctoral programs have measured research
activity of both faculty and graduates. These studies include Brown and
Gardner (1985), Brown (1996), Everett, Klamm, and Stoltzfus (2004), and
Brown and Laksmana (2007). Similarly, Mittermaier (1991) analyzed
representation on editorial boards. Studies of placement of doctoral
accounting graduates include Stammerjohan and Hall (2002), and Fogarty
and Saftner (1993a, 1993b). Fogarty and Markarian (2007) combined two

previous rankings (Hasselback & Reinstein, 1995; Fogarty, 1995) to create a prestige ranking of doctoral granting programs. Urbancic (2008) used a multiattribute approach to rank doctoral programs. Stammerjohan, Seifert, and Guidry (2009) further examine the prestige of doctoral granting programs and lifestyle choices in the initial placement of graduates. Most of these studies have only addressed a subset of accounting doctoral programs and/or a subset of journals.

Both research output and placement information are important. Just as Stammerjohan and Hall (2002, p. 2) argue that potential doctoral students need to know if the programs to which they apply have a history of placing graduates at the type of institutions where they desire future employment, these applicants may also want to know more about programs with regard to many other factors, including the admission of women and minorities, as well as further characteristics of graduates' employment and success. Therefore, this study's purpose is to provide prospective doctoral students, search committees, doctoral program directors, and other interested parties with comprehensive information that has not been previously available about doctoral programs in accounting.

RESEARCH METHODOLOGY

This section describes the research methodology used to investigate the following broad research questions:

- How do the doctoral programs differ in size (number of graduates) and trends (growing, shrinking, etc.)?
- In what ways do the demographic characteristics, including gender and minority status, of graduating doctoral students in accounting vary among programs?
- In what ways do characteristics of the employers of doctoral accounting graduates vary among programs?
- To what extent do program graduates vary in the rate of appointment to administrative and endowed positions?

The basic data consist of U.S. accounting doctoral graduates, 1987–2006. These graduates were initially identified through Hasselback's (2007) online listing of doctoral graduates by school. This source contains information about each graduate such as academic rank, employer, administrative position, professorships, and professional certifications. Each program was also researched to identify missing graduates. Then, each individual

graduate was researched to update, correct, and add supplemental variables. Extensive Internet searches, phone calls and e-mails enabled the collection of corrections and additional information. Supplemental data about the employing universities were collected from a variety of sources including the AACSB, the Carnegie Foundation, the U.S. Department of Education, and other public resources. Variables describing graduates include rank, current employment, alma mater, degree year, gender, minority status, administrative positions, endowed positions, country, and state (if USA).

Information on minority status was provided by the PhD Project (2007). The minority information was cross-checked through Internet searches and e-mails. For the purposes of this research, minorities are identified as African-American, Native American, and Hispanic American. These are recognized as underrepresented minorities and are those specifically encouraged by the PhD Project (2007) to pursue doctorates in business disciplines.

Gender was determined based on the given name of the graduate. For gender neutral names and foreign names, gender was determined through one of the following methods: e-mailing an inquiry to the graduate, searching the web for photos, searching for publications of the graduate in which the graduate is referred to by gender (such as in biographical sketches), and/or asking several native speakers of the foreign language to identify the gender from the name (gender was left undetermined if agreement was not 100%). Gender was determined for over 95.7% of the graduates.

The location (country or state) of each graduate was determined based on their place of employment or other information about their current activities found on the Internet or through e-mail and phone inquiries. Note that information is unknown or inapplicable on some variables for some graduates, thus not all tables sum to *3,213*, the total number of accounting doctoral graduates from 1987 to 2006.

The data were analyzed using basic descriptive statistics. The following sections discuss the results and their implications.

RESULTS

This section discusses size trends, graduate characteristics, graduate placement, and graduate appointments. Basic demographics are shown in the accompanying tables.

Size Trends

A total of 95 schools conferred accounting doctorates in the USA from 1987 through 2006. The total number of graduates was 3,213. The number of accounting doctoral program graduates per program ranged from a low total of 1 graduate (Hawaii, Vanderbilt, Cal-Irvine) to a high of 87 graduates (Texas A&M). The average program (both mean and median) in size graduated 34 doctoral students during this 20-year period. Table 1 summarizes the total number of graduates for each program. These can be sorted into quartiles containing 23 or 24 programs. Note that all programs in the last quartile and three programs in the third quartile graduated less than one person per year on average over the two-decade period. Since these programs are small, they will not be included in some of the later analyses.

Table 1. Accounting Doctoral Graduates by Program, 1987–2006 (Size; 3,213 Graduates).

No.	Program	#	No.	Program	#	No.	Program	#	No.	Program	#
1	TX A&M	87	25	Ark	46	49	Columbia	31	73	Mass	17
2	Texas	78	26	FL St	45	50	Drexel	31	74	Syracuse	16
3	Illinois	72	27	Indiana	45	51	Nrthwstn	31	75	WUSL	15
4	Miss	70	28	Tenn	44	52	Cornell	30	76	Cent FL	14
5	Va Tech	70	29	TX Tech	44	53	Purdue	29	77	Cincinnati	14
6	Kentucky	69	30	GA St	43	54	Minnesota	28	78	Cleveland St	14
7	Wisc	69	31	Colo	42	55	Oklahoma	28	79	MIT	13
8	Arizona	64	32	NYU	42	56	Penn	28	80	FL Atlantic	12
9	Georgia	64	33	Okla St	42	57	Rochester	28	81	UCLA	12
10	Penn St	63	34	Rutgers	42	58	S. Illinois	28	82	Union-NY	10
11	Nebraska	61	35	Alabama	41	59	Oregon	27	83	TX-Dallas	9
12	Arizona St	60	36	VCU	40	60	TX-Arl	27	84	Tulane	8
13	Houston	60	37	Memphis	38	61	Utah	27	85	Duke	6
14	Mich St	60	38	Stanford	37	62	Baruch	25	86	Jackson St	6
15	N Texas	65	39	Chicago	36	63	Connecticut	24	87	Florida Int'l U.	4
16	WA, U of	55	40	Missouri	36	64	CMU	23	88	SUNY-Bingh.	4
17	S. Carolina	54	41	NC	36	65	GWU	23	89	Yale	4
18	Michigan	52	42	So. Cal.	36	66	Wash St	23	90	Georgia Tech	3
19	LA Tech	51	43	Berkeley	35	67	Kansas	22	91	Rice	3
20	Ohio State	50	44	Boston U.	35	68	SUNY-Buff.	21	92	UTSA	3
21	Kent St	49	45	Maryland	35	69	St. Louis	21	93	Miami	2
22	LSU	49	46	Pittsburgh	35	70	CWRU	19	94	Cal-Irvine	1
23	Florida	47	47	Iowa	34	71	Harvard	19	95	Hawaii	1
24	Miss St	47	48	Temple	34	72	S. Florida	19	96	Vanderbilt	1
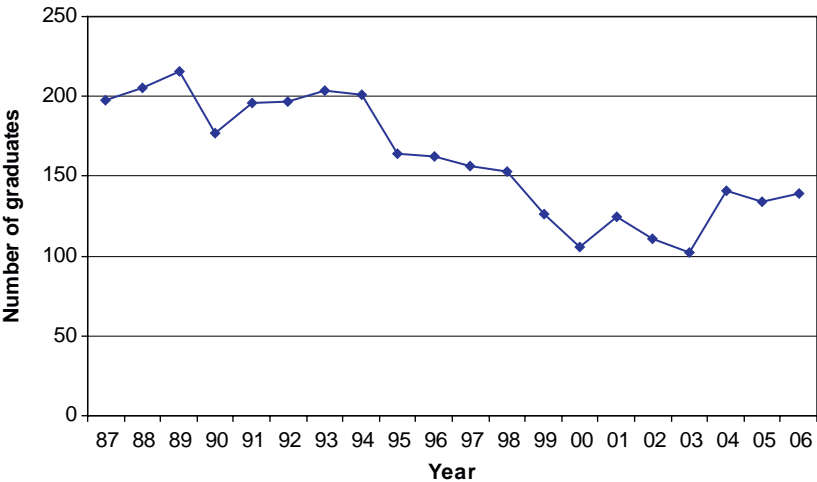
Fig. 1. Doctoral Accounting Degrees Conferred, 1987–2006.

As shown in Fig. 1, the decreasing trend over time for the number of accounting doctoral degrees conferred and in accounting faculty has been well documented and discussed (Plumlee, Kachelmeier, Madeo, Pratt, & Krull, 2006, pp. 113–119; Fogarty & Markarian, 2007, pp. 147–150; Grasso, 2008, p. 15; McNair & Richards, 2008, pp. 21–22). As recently as 2003, only 102 accounting doctorates were conferred in the U.S. Two decades ago in 1989, a high of 216 accounting doctorates were conferred.

Table 2 displays the trends by program. This analysis of graduates of each program by decade reveals that most programs have fewer graduates in the second decade than in the first decade. This is true for many well-established programs. The following parenthetical numbers refer to the decrease from the first decade to the second decade. The 10 programs that have decreased by 20 or more graduates account for 39% of the total decline in students: Houston (−32), North Texas (−31), Georgia (−28), Illinois (−24), LSU (−24), Wisconsin (−24), Texas Austin (−23), Minnesota (−22), Kentucky (−21), Nebraska (−21), and Memphis (−20). These schools experienced declines from the first decade to the second ranging from −44% to −69%. The next 10 schools in terms of the decrease in the number of students account for another 27% of the total decline: University of Washington (−19), South Carolina (−18), Florida State (−17), Florida (−17), Mississippi State (−17), Penn State (−17), Arizona State (−16), Mississippi (−16), Ohio State (−16), and Minnesota (−16). All of these schools are public rather than private schools.

Table 2. Program Trends, First Decade (1987–1996) Compared to Second (1997–2006).

	Program	1st	2nd	%Δ		Program	1st	2nd	%Δ		Program	1st	2nd	%Δ	Program	1st	2nd	%Δ
			Decade					Decade					Decade				Decade	
New	Cal-Irvine	0	1	New	Relatively	WUSL	7	8	14	Shrinking	Ark	27	19	−30	Ohio St	33	17	−48
	Hawaii	0	1	New	steady	Harvard	9	10	11		Kent St	29	20	−31	Illinois	48	24	−50
	Jacksn St	0	6	New		SUNYBu	10	11	10		Utah	16	11	−31	SC	36	18	−50
	SUNY-Bi	0	4	New		Oregon	13	14	8		Arizona	38	26	−32	Wisc	46	23	−50
	TX-Dallas	0	9	New		Maryland	17	18	6		Berkeley	21	14	−33	Nebr	41	20	−51
	UTSA	0	3	New		NYU	21	21	0		Pitt	21	14	−33	WA	37	18	−51
						Rochester	14	14	0		Va Tech	42	28	−33	Florida	32	15	−53
Growing	FL Atl	1	11	1000		Tulane	4	4	0		Okla	17	11	−35	Miss St	32	15	−53
	MIT	2	11	450		VCU*	20	20	0		S Ill*	17	11	−35	Kansas	15	7	−53
	Yale	1	3	200		Stanford	19	18	−5		So Cal	22	14	−36	Alabama	28	13	−54
	Conn*	7	17	143		Michigan	27	25	−7		Miss	43	27	−37	Fl St	31	14	−55
	Columbia	10	21	110		Baruch	13	12	−8		Mich St	37	23	−38	Purdue	20	9	−55
	Duke*	2	4	100		Mass	9	8	−11		Okla St	26	16	−38	TX-Ar	19	8	−58
	Rutgers*	14	28	100		Penn	15	13	−13		AZ State	38	22	−42	Georgia	46	18	−61
	S Florida*	7	12	71		Colorado	23	19	−17		Penn St	40	23	−43	LSU	36	13	−64
	Chicago	15	21	40		N'westn	17	14	−18		Missouri	23	13	−43	N Texas	48	17	−65
	CWRU	8	11	38		TX A&M	48	39	−19		Texas	50	28	−44	TX-Ar	19	8	−58
	Cleve St*	6	8	33		Iowa	19	15	−21		Cen FL*	9	5	−44	FL Int'l*	3	1	−67
	Carnegie M	10	13	30		Temple	19	15	−21		Indiana	29	16	−45	UCLA	9	3	−67
	GWU	10	13	30		Syracuse	9	7	−22		Drexel	20	11	−45	St. Louis	16	5	−69
	NC	16	20	25		Wash St	13	10	−23		LaTech	33	18	−45	Memphis	29	9	−69
						Cornell	17	13	−24		GA State	28	15	−46	Houston	46	14	−70
						TX Tech	25	19	−24		Kent'y	45	24	−47	Minn	22	6	−73
						Boston U	20	15	−25		Tenn	29	15	−48	Union	8	2	−75
															Cinci	13	1	−92

Note: * indicates newer programs. Four programs are inactive (no graduates in second decade): Georgia Tech*, Miami*, Rice*, and Vanderbilt*.

Only one-quarter (24) of the programs actually graduated more accounting doctorates in the second decade than the first. Six of the programs with increases are programs that were started in the second decade (Cal-Irvine, Hawaii, Jackson St, SUNY-Binghamton, Texas-Dallas, and Texas-San Antonio). Fourteen programs had at least a 25% increase in graduates in the second decade (Florida Atlantic, MIT, Yale, Connecticut, Columbia, Duke, Rutgers, South Florida, Chicago, Case Western, Cleveland State, Carnegie Mellon, George Washington, and North Carolina). A further four programs had modest (6–11%) increases in the number of graduates (Harvard, SUNY-Buffalo, Oregon, Maryland). This information may be useful to applicants who are looking for programs that are growing.

Five of the fourteen growing programs were created early in the period of study or the year prior (Connecticut, Duke, Rutgers, South Florida, Cleveland State). With the exception of Rutgers, all of these programs are below average in size. Not all programs newly created during the period of study experienced growth. Several either declined (Virginia Commonwealth, Southern Illinois, Central Florida, and Florida International) or became inactive (Georgia Tech, Miami, Rice, Vanderbilt), Clearly, the new programs begun during this period have not made up for the decrease in doctorates conferred by the more established programs.

Further analysis of the data underlying Table 2 revealed that in the first decade 24 programs accounted for half of the graduates (955 of 1,911). In the second decade, 29 programs accounted for more than half of the graduates (648 of 1,293). Note the changing make-up of the largest programs from one decade to another. Several universities that are listed among the larger programs in the first decade do not appear among the larger programs in the second decade. These include Florida State, Florida, Houston, LSU, Mississippi State, North Texas, and Ohio State. Quite a few universities newly appear amongst the largest programs during the second decade. These include Arkansas, Chicago, Colorado, Columbia, Maryland, Michigan, North Carolina, NYU, Rutgers, Stanford, Texas Tech, and Virginia Commonwealth. This information may be useful to applicants who are looking for large programs.

To more clearly illustrate the trends over time for each group shown in Table 2, Fig. 2 shows the total number of graduates per year for each group. The decreasing trend of the shrinking programs is obvious. The growing programs are growing at a much slower rate, clearly. However, since the shrinking programs greatly outnumber all other programs, the visual comparison is a bit skewed. Fig. 3 illustrates the average number of graduates per program for each year from each of the differently trending groups of
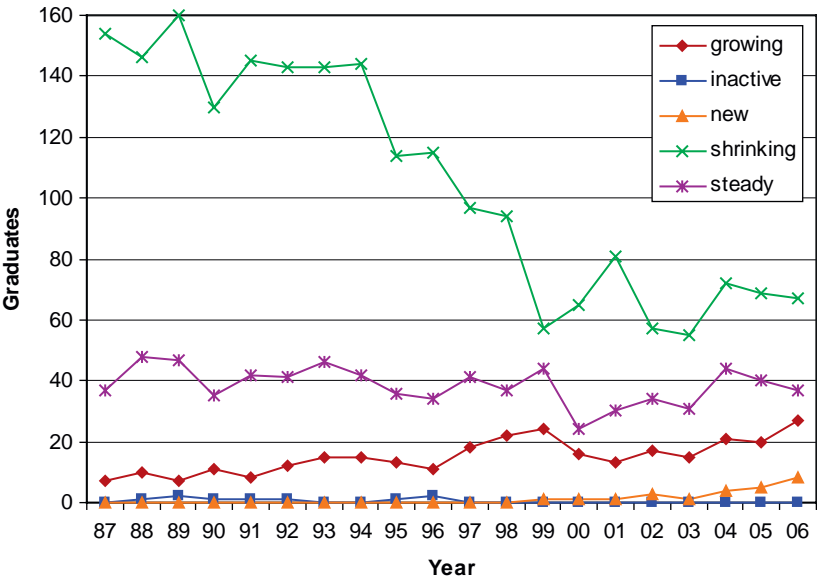
Fig. 2. Doctoral Accounting Degrees Conferred, 1987–2006, by Trend Groups.
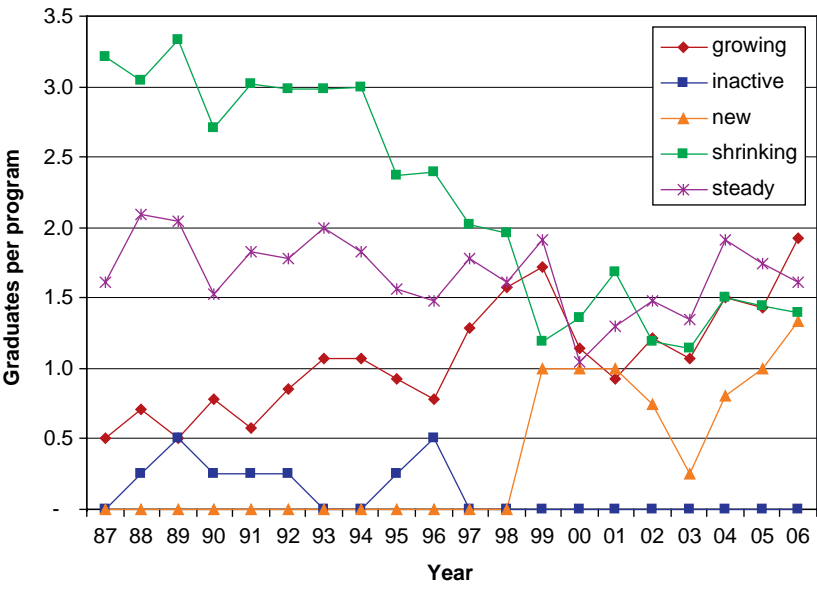
Fig. 3. Average Number of Degrees Conferred Per Year, 1987–2006, by Trend Groups.

programs discussed in Table 2. This figure controls for the number of programs in each group. The growth trends in number of graduates per program are relatively clear. New programs and those that are growing are not only trending upward but were graduating a comparable or higher number of graduates per year than the much larger shrinking programs group. Whether these trends continue in the future will be interesting to observe.

These data highlight the need for more accounting doctorates since demand is well documented and much higher than current supply (Plumlee et al., 2006, pp. 113–118; AACSB International, 2003, p. 13). However, even the creation of more doctoral programs during this period (1987–2006) has not increased the annual number of accounting doctoral graduates.

Given these trends, what is the answer to the supply problem in academic accounting? Why are the larger established programs actually shrinking? Are still more doctoral programs needed? Thus far, establishing new doctoral programs alone has not proved a real solution. These new programs are adding to the supply, but not enough to offset the decline in the number of graduates from most of the established programs. Is shrinkage in the larger more established programs due to lack of qualified applicants, lack of funding, or some other reason? Should current programs increase the number of students admitted? Are programs admitting significantly more students but incurring high attrition? Can larger established programs use economies of scale to support new growth? Possibly this is the most cost-effective solution, given the initial difficulty getting new doctoral programs approved and the costs of running a doctoral program. More research should address the underlying causes of the decline in total accounting doctoral graduates over time and the decline trend in doctoral graduates for individual schools.

Graduate Characteristics

Overall, the percentage of total graduates who are women and under-represented minorities earning accounting doctorates is increasing (Baldwin, Brown, & Trinkle, 2008a, 2008b). A diverse faculty yields outcomes that enhance the overall educational experience of students (Smith, Wolf, & Bulsenberg, 1996, p. 133; Johnson, 2001, p. 4; Igwebuike, 2006, pp. 188–190). In addition, the AASCB expects accredited schools to define diversity within their own mission and cultural context (Weisenfeld & Robinson-Backmon, 2007, p. 429). In order to have a diverse accounting faculty, the population of accounting doctoral graduates must also be diverse.

Gender

From 1987 to 2006, 38% of accounting doctorates were earned by females. This is a substantial improvement over previous periods (Norgaard, 1989, p. 14). Some schools, however, have not conferred many degrees on females, whereas other schools have a much higher than average percentage of female doctoral graduates.

Table 3 lists the percentage of each program's graduates according to gender. While these percentages are not particularly meaningful for programs with small numbers of graduates, they are quite interesting for the larger programs. For example, for nine schools that graduate an average of one or more graduates per year (at least 20 for the period of study), less than 25% of their graduates are female. These schools include Iowa, Memphis, Minnesota, NYU, Ohio State, Penn, Purdue, Southern Illinois, and Texas Tech. These schools represent a wide variety of geographic locations and quality (see for example, Everett et al. (2004) or Urbancic (2008) for rankings of schools). Less than one-third of graduates are female at an additional 10 schools with an average of one or more graduates per year: Arizona, Berkeley, Columbia, CUNY Baruch, Florida St, Illinois, Nebraska, Oregon, Stanford, and Virginia Tech.

In contrast, for eight schools that graduate an average of one or more graduates per year (at least 20 for the period of study), 50% or more of their graduates are female. These schools include Alabama, Boston U., George Washington, LSU, Michigan, North Carolina, Oklahoma State, and Texas-Arlington. This much more closely resembles the recent percentage of females receiving accounting bachelors ($>50\%$) and masters ($>55\%$) degrees.

Minority

Accounting doctoral programs have struggled to admit students from underrepresented minorities (Hammond, 1995, p. 143), including African-Americans, Native Americans, and Hispanic Americans. Since 1994, the PhD Project has been working to increase the diversity of accounting faculty, with particular effort aimed at attracting African-Americans, Hispanic Americans, and Native Americans to business doctoral programs (PhD Project, 2007). The AICPA and other professional associations are also involved in minority faculty and doctoral candidate initiatives (AICPA, 2008).

From 1987 to 2006, approximately 4.6% of accounting doctorates were earned by underrepresented minorities (see Table 4). Specifically, 3.6% of graduates were African-American,[1] less than 1% was Hispanic-American, and very few (0.09%) were Native-American. The good news is over time

Table 3. Graduates by Gender (for the 95.1% With Known Gender), Mean = 37.7% Female.

Program	#	Male (%)	Female (%)	Program	#	Male (%)	Female (%)	Program	#	Male (%)	Female (%)	Program	#	Male (%)	Female (%)
Duke	5	0	100	S Fl	19	53	47	Conn	24	63	38	Nebr	57	72	28
Vandy	1	0	100	VCU	38	53	47	Mass	16	63	38	Ariz	62	73	27
Fl Int'l	3	33	67	CWRU	17	53	47	MO	35	63	37	Columbia	30	73	27
GWU	22	36	64	MD	32	53	47	Fl	44	64	36	Oregon	27	74	26
Cinci	14	43	57	Cornell	30	53	47	Tenn	44	64	36	Stanford	35	74	26
Cleve St	13	46	54	Texas	74	54	46	Georgia	64	64	36	NYU	40	75	25
MIT	13	46	54	Drexel	31	55	45	Syracuse	14	64	36	Bingh.	4	75	25
Boston U	34	47	53	St. Louis	20	55	45	Ky	63	65	35	Iowa	31	77	23
NC	34	47	53	N Texas	64	56	44	Utah	26	65	35	Ohio St	49	78	22
Okla St	42	48	52	Cen FL	14	57	43	Penn St	61	66	34	Memphis	36	78	22
Tx-Arl	25	48	52	Roch	28	57	43	Miss	70	66	34	TxDallas	9	78	22
LSU	49	49	51	Colo	41	59	41	Ga St	38	66	34	Purdue	23	78	22
Alabama	40	50	50	Rutgers	39	59	41	Chicago	36	67	33	S. Ill	28	79	21
Jack St	6	50	50	Temple	32	59	41	Kent St	48	67	33	Harvard	19	79	21
Miami	2	50	50	Wash St	22	59	41	Rice	3	67	33	Tx Tech	43	79	21
Mich	52	50	50	SC	52	60	40	Buffalo	18	67	33	Minn	27	81	19
Yale	4	50	50	Indiana	45	60	40	CMU	19	68	32	UCLA	9	89	11
Tx A&M	86	51	49	LaTech	51	61	39	Va Tech	69	70	30	Union	10	90	10
S Cal	35	51	49	Ariz St	59	61	39	WUSL	14	71	29	FL Atl	12	92	8
Mich St	58	52	48	N'west'n	31	61	39	Baruch	24	71	29	Penn	26	92	8
Wash	52	52	48	Pitt	31	61	39	Berkeley	31	71	29	Ca-Irvine	1	100	0
Okla	25	52	48	Wisc	62	61	39	Fl St	45	71	29	Ga Tech	2	100	0
Ark	44	52	48	Houston	57	61	39	Ill	63	71	29	Hawaii	1	100	0
Kansas	19	53	47	Miss St	47	62	38	Tulane	7	71	29	UTSA	3	100	0

Table 4. Underrepresented Minority Graduates.

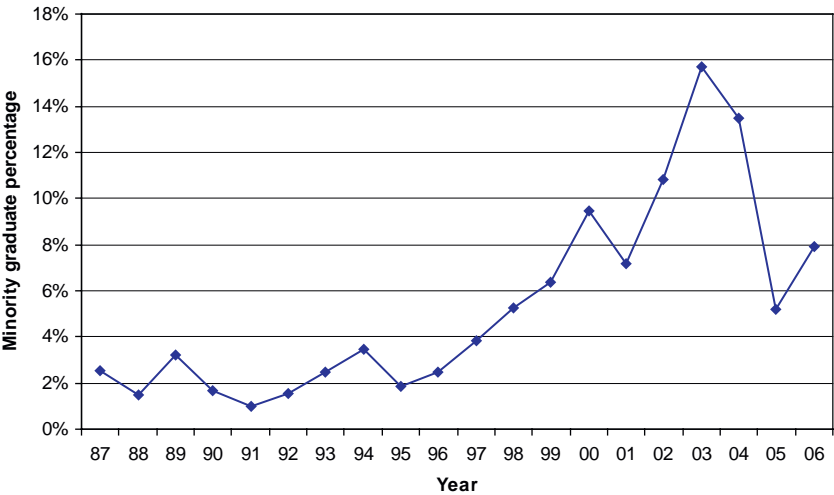| Program	Grads	Minority (%)	Program	Grads	Minority (%)	No Underrepresented Minority Graduates 1987–2006 (By Size)			
						Program	Total grads	Program	Total grads
Jackson St	6	100.0	Houston	60	5.0	Illinois	72	Harvard	19
UTSA	3	66.7	St. Louis	21	4.8	Nebraska	61	Mass	17
WUSL	15	20.1	Colorado	42	4.8	WA., U of	55	Syracuse	16
GWU	23	17.4	Georgia	64	4.7	LSU	49	Cincinnati	14
S. Florida	19	15.8	Indiana	45	4.4	Southern Cal	36	Cleveland St	14
TX A&M	87	14.9	Arkansas	46	4.3	Chicago	36	MIT	13
Okla St	42	14.3	Kentucky	69	4.3	Berkeley	35	UCLA	12
VCU	40	12.5	Florida	47	4.3	BostonU	35	FL Atlantic	12
Memphis	38	10.5	Kent St	49	4.1	Northwestern	31	Union-NY	10
Va Tech	70	10.0	LaTech	51	3.9	Columbia	31	Texas-Dallas	9
Rutgers	42	9.5	Michigan	52	3.8	Purdue	29	Tulane	8
Florida St	45	8.9	Minnesota	28	3.6	Penn	28	Duke	6
Maryland	35	8.6	Oklahoma	28	3.6	Rochester	28	SUNY-Bing.	4
Mich St	60	8.3	Cornell	30	3.3	Oregon	27	Yale	4
AZ State	60	8.3	Drexel	31	3.2	Utah	27	Florida Int'l	4
Wash St	38	7.9	Temple	34	2.9	CUNY Baruch	25	Rice	3
TX-Arl'n	27	7.4	Iowa	34	2.9	Connecticut	24	Georgia Tech	3
S. Illinois	28	7.1	Pittsburgh	35	2.9	CMU	23	Miami	2
Cen Florida	14	7.1	Missouri	36	2.8	Wash St	23	Vanderbilt	1
Georgia St	43	7.0	NCarolina	36	2.8	Kansas	22	Cal-Irvine	1
TX-Austin	78	6.4	Alabama	41	2.4	SUNY-Buffalo	21	Hawaii	1
Arizona	64	6.3	NYU	42	2.4				
N. Texas	65	6.2	Tennessee	44	2.3				
Ohio State	50	6.0	TX Tech	44	2.3				
Wisconsin	69	5.8	Miss St	47	2.1				
SCarolina	54	5.6	Penn St	63	1.6				
Stanford	37	5.4	Miss	70	1.4				
CWRU	19	5.3							

Fig. 4. Percentage of Degrees Conferred on Underrepresented Minorities, 1987–2006.

the trends are generally increasing toward the percentage of graduates who are minorities. While the number of minority graduates is still relatively small, the percentage of all graduates who are from underrepresented minorities is growing over time, as shown in Fig. 4.

Some schools, however, have not conferred many degrees on these underrepresented minorities, whereas other schools have a much higher than average percentage of minority graduates. Table 4 lists the percentage of each program's graduates who have been identified as belonging to an underrepresented minority group.[2] These percentages may not be particularly meaningful for programs with very small numbers of graduates. However, note that 41 programs do not have any graduates during the 20-year period who are known to be underrepresented minorities. These 41 schools include some of the largest programs. Of the schools that graduate an average of one or more graduates per year (at least 20 for the period of study), 20 programs have not graduated any known underrepresented minority graduates. These schools, listed by number of accounting doctoral graduates, are Berkeley, Boston, Chicago, Carnegie Mellon, Columbia, Connecticut, Baruch, Illinois, Kansas, LSU, Nebraska, Northwestern, Oregon, Penn, Purdue, Rochester, Southern California, SUNY-Buffalo, Utah, and University of Washington. These schools represent a wide range of geography and program types.

In contrast, several schools that graduate an average of one or more graduates per year (at least 20 for the period of study) have 10% or more minority graduates. These schools are George Washington, Memphis, Oklahoma State, Texas A&M, Virginia Commonwealth, and Virginia Tech. These are all located in the Southern half of the country.

Graduate Placement

Perhaps a more telling examination of accounting doctoral programs is to consider placement of the graduates. Research on doctoral placement has mostly considered initial placement of graduates (Fogarty & Saftner, 1993a, 1993b; Stammerjohan & Hall, 2002; Stammerjohan et al., 2009). This section compares the doctoral programs based on the current (2007) employment of the (1987–2006) graduates and characteristics of the current (2007) employing institutions: AACSB accreditation, Carnegie classification, and the highest accounting degree conferred by the department. Note that these variables are not known for all employing institutions. For example, Carnegie classification is only known for U.S. schools.

Accreditation

AACSB accreditation is considered by many to be an indicator of excellence in business education. Therefore, the programs were examined according to whether their graduates are currently employed at accredited schools (AACSB International, 2009).[3] Overall, 71% of graduates are employed in AACSB accredited schools. Note that this number may be skewed low because of the low number of foreign schools with AACSB accreditation in the past. The vast majority of programs (94%) have at least 50% of graduates employed at AACSB accredited schools. While these percentages might not be illustrative for the smaller doctoral programs, they can be used for comparison of the established programs.

As shown in Table 5, of the schools that graduate an average of one or more graduates per year (at least 20 for the period of study), 14 have at least 80% of graduates currently employed by AACSB accredited schools. These programs are Arizona, Chicago, Connecticut, Cornell, Florida State, Indiana, LSU, Michigan State, Michigan, North Carolina, Pittsburgh, Stanford, Tennessee, and Texas Tech. Similarly four of the schools that graduate an average of one or more students per year (at least 20 for the period of study) have less than 50% of graduates currently employed by AACSB schools.[4] These schools are Baruch, North Texas, St. Louis, and

Table 5. Graduate Employment at AACSB Accredited Schools.

Program	#	AACSB (%)	Program	#	AACSB (%)	Program	#	AACSB (%)	Program	#	AACSB (%)
Ca-Irvine	1	100.0	Pitt	35	80.0	Cen Fl	14	71.4	Miss St	47	63.8
Duke	6	100.0	Union-NY	10	80.0	Minn	28	71.4	Miss	70	62.9
Hawaii	1	100.0	Georgia	64	79.7	Buffalo	21	71.4	Ga St	43	62.8
Miami	2	100.0	Iowa	34	79.4	Memphis	38	71.1	Rutgers	42	61.9
UTSA	3	100.0	S Florida	19	78.9	Columbia	31	71.0	VCU	40	60.0
Vandyt	1	100.0	Okla St	42	78.6	Temple	34	70.6	Purdue	29	58.6
Yale	4	100.0	Penn	28	78.6	Texas	78	70.5	BostonU	35	57.1
MIT	13	92.3	Rochester	28	78.6	Utah	27	70.4	Maryland	35	57.1
LSU	49	89.8	AZ State	60	78.3	KY	69	68.1	Syracuse	16	56.3
TxDallas	9	88.9	Missouri	36	77.8	Drexel	31	67.7	Tx-Arli	27	55.6
Wash St	23	86.9	Oregon	27	77.8	Wash	55	67.3	Okla	28	53.6
Cornell	30	86.7	SCarolina	54	77.8	FL Atl	12	66.7	S Illinois	28	53.6
Chicago	36	86.1	S. Calif.	36	77.8	GA Tech	3	66.7	Kent St	49	53.1
Mich	52	84.6	N'western	31	77.4	Jackson St	6	66.7	CMU	23	52.2
Arizona	64	84.4	TX A&M	87	77.0	LaTech	51	66.7	Arkansas	46	50.0
Tenn	44	84.1	Va Tech	70	75.7	NYU	42	66.7	Cleve St	14	50.0
Stanford	37	83.8	Houston	60	75.0	Rice	3	66.7	Bingh	4	50.0
Conn	24	83.3	Illinois	72	75.0	Wisc	69	66.7	UCLA	12	50.0
Mass	17	82.4	Tulane	8	75.0	WUSL	15	66.7	Baruch	25	48.0
TX Tech	44	81.8	Florida	47	74.5	Alabama	41	65.9	N Texas	65	47.7
Mich St	60	81.7	Ohio St	50	74.0	Berkeley	35	65.7	St. Louis	21	47.6
NC	36	80.6	Harvard	19	73.7	Cinci	14	64.3	CWRU	19	47.4
FL St	45	80.0	Penn St	63	73.0	Colo	42	64.3	GWU	23	43.5
Indiana	45	80.0	Kansas	22	72.7	Nebr	61	63.9	Fl Int'l	4	0.0

George Washington. If the bar is raised to 60%, nine more schools join the list including Arkansas, Boston U., Carnegie Mellon, Kent State, Maryland, Oklahoma, Purdue, Southern Illinois, and Texas-Arlington. These schools represent a wide range of geography and program types.

Carnegie Classification
The Carnegie basic classification is assigned by the Carnegie Foundation (2007) based on characteristics of the institution (size, level and types of degrees conferred, research output, etc.). This is an overall classification of the university and not necessarily reflective of individual accounting and business schools. The doctoral classifications include RU/VH (research university/very high output), RU/H (research university/high output), and DRU (doctoral research university). These are in decreasing order of overall research output for the entire university. Note that the doctoral Carnegie classifications (RU/VH, RU/H, DRU) do not indicate whether the institution has a doctoral program *in accounting*. The basic classification is an overall descriptor for the whole university (Table 6).

Of the accounting doctoral programs with at least 20 (1987–2006) graduates employed by institutions with Carnegie classifications (basically all U.S. institutions), 10 have 80% or more currently employed at Carnegie doctoral institutions. These institutions include NYU, Rochester, Iowa, Stanford, Northwestern, Michigan, Cornell, Illinois, Chicago, and Columbia.

At the opposite end of the Carnegie classifications, of the accounting doctoral programs with at least 20 (1987–2006) graduates employed by institutions with Carnegie classifications, three have more than 20% of graduates employed at bachelors (or associates) focused institutions. These institutions include Louisiana Tech, Virginia Commonwealth, and Wisconsin.

Degree Program
Each employing institution can be classified according to the highest degree it confers in accounting: bachelors, masters, and doctorate. This variable is used to describe the programs based on their current placement of graduates in academic accounting departments in each category. Since many schools have less than 20 graduates during this period for whom this variable is known (mostly due to foreign employment or unusual employment), only those with at least 20 graduates in the data are discussed. The full results are shown in Table 7.

At one extreme, some doctoral programs appear to have very good placement of their graduates on the faculty of other accounting doctoral

Table 6. Graduate Employment by Carnegie Classification.

Above Average Carnegie Doctoral Placement					Above Average Carnegie Bachelors Placement				
Program	#	≤ Bac (%)	Mas. (%)	Doc. (%)	Program	#	≤ Bac (%)	Mas. (%)	Doc. (%)
NYU	22	0	5	95	Wisc	48	23	35	42
Roch	21	0	5	95	VCU	33	21	52	27
Iowa	25	4	4	92	LaTech	40	20	53	28
Stanford	25	0	8	92	VaTech	62	16	39	45
N'wstn	20	0	10	90	Alabama	32	16	50	34
Mich	44	2	9	89	S Ill	20	15	70	15
Cornell	24	0	17	83	Ga St	34	15	41	44
Illinois	51	6	12	82	Drexel	25	12	60	28
Chicago	27	0	19	81	N Texas	50	12	56	32
Colu	21	5	14	81	Fl St	42	12	31	57
Mich St	53	6	17	77	Kent St	35	11	66	23
NC	30	10	13	77	SC	46	11	30	59
FL	34	3	21	76	Miss St	38	11	71	18
Pitt	29	3	21	76	TxA&M	80	10	36	54
Texas	57	5	19	75	Okla St	40	10	30	60
WA	35	9	17	74	NC	30	10	13	77
OH St	37	5	24	70	Miss	63	10	68	22
IN	39	3	28	69	Wa St	21	10	48	43
Penn St	50	6	26	68	Conn	22	9	59	32
AZ St	49	0	33	67	Georgia	56	9	41	50
Ariz	56	5	29	66	Memph	34	9	74	18
Tenn	40	5	33	63	Ark	34	9	47	44
Okla St	40	10	30	60	WA	35	9	17	74
S. Cal	25	4	36	60	Nebr	47	9	57	34
SC	46	11	30	59	Boston	24	8	38	54
FL St	42	12	31	57	MD	25	8	48	44
					Colo	25	8	40	52
					Rutgers	31	6	65	29

Table 7. Graduate Employment by Employer's Highest Accounting Degree Program.

Above Average Doctoral Placement				Above Average Bachelors Placement			
Program	Bach. (%)	Mas. (%)	Doc. (%)	Program	Bach. (%)	Mas. (%)	Doc. (%)
Stanford	0	4	96	VCU	43	53	3
Michigan	0	16	84	Miss St	35	65	0
Chicago	0	20	80	LaTech	35	57	8
Iowa	0	22	78	Colorado	31	27	42
Rochester	0	30	70	Temple	26	74	0
Florida	3	32	65	North Texas	23	61	16
Cornell	4	35	61	Miss	22	73	5
Columbia	14	29	57	Va Tech	20	69	11
NCarolina	7	39	54	Arizona	20	38	43
Wash, U of	15	33	52	Kent St	19	81	0
TX-Austin	5	44	51	Kentucky	19	71	10
NYU	10	43	48	Georgia St	18	52	30
Indiana	13	39	47	Maryland	18	55	27
Penn St	8	46	46	Georgia	18	65	16
S. Calif.	11	44	44	Florida St	18	62	21
WUSL	11	44	44	Rutgers	18	82	0
Arizona	20	38	43	Okla St	18	63	20
Colorado	31	27	42	Missouri	17	48	34
Ohio State	6	56	39	Nebraska	16	70	14
Pittsburgh	15	48	37	Memphis	16	74	10
Illinois	7	59	35	Drexel	16	84	0
Missouri	17	48	34	Arkansas	16	66	19
				Wash St	16	63	21
				Wisconsin	15	70	15
				Wash, U of	15	33	52
				Pittsburgh	15	48	37
				Columbia	14	29	57
				SCarolina	14	64	21

programs. Of the schools with at least 20 graduates in this subsample, four have placed at least 75% of their graduates in doctoral-granting accounting departments. These include Chicago, Iowa, Michigan, and Stanford. A further seven programs have placed at least 50% of their graduates in doctoral-granting accounting departments, including Columbia, Cornell, Florida, North Carolina, Rochester, Texas-Austin, and Washington.

At the other extreme, the current placement of graduates at bachelors-only departments does not exceed 50% for any accounting doctoral program. Three doctoral programs with at least 20 graduates in this

subsample have placed more than one-third of their graduates in bachelors-only departments. These are Louisiana Tech, Mississippi State, and Virginia Commonwealth. Lowering the threshold to one-quarter only adds two more programs: Colorado and Temple.

Foreign Employment
Approximately 14% of the graduates whose location is known are employed outside of the USA (see Table 8). Four programs (of those with at least 20 in the subset) have placed over 30% of their graduates outside the USA. These include Berkeley, Purdue, Minnesota, and NYU. A further 13 programs (of those with at least 20 in the subset) have placed over 20% of their graduates outside the USA. These include Baruch, Colorado, Illinois, Kansas, Northwestern, Oregon, Pennsylvania, Southern Illinois, Stanford, Washington,

Table 8. Graduate Employment, Programs With Above Average Foreign Placement.

Program	Total	Foreign (%)	Program	Total	Foreign (%)
Georgia Tech	3	67	Wisconsin	66	21
UCLA	10	60	Northwestern	30	20
Florida Int'l	2	50	Oregon	25	20
Carnegie Mellon	17	47	Iowa	31	19
Berkeley	32	47	BostonU	32	19
Purdue	28	43	Maryland	32	19
Case Western	17	41	Houston	60	18
Tulane	8	38	Florida	44	18
SUNY-Buffalo	19	37	Rutgers	39	18
Minnesota	27	33	Chicago	34	18
NYU	37	32	Southern Cal	34	18
Syracuse	16	31	Cornell	29	17
Florida Atlantic	10	30	Arkansas	42	17
CUNY Baruch	22	27	Drexel	30	17
Kansas	22	27	Duke	6	17
Penn	26	27	WUSL	12	17
Southern Illinois	27	26	St. Louis	19	16
Illinois	66	24	Texas-Austin	70	16
Harvard	17	24	Temple	32	16
Stanford	34	24	Cleveland St	13	15
Washington, U of	48	23	Oklahoma	26	15
Colorado	35	23	Nebraska	59	15
GWU	18	22	Ohio State	48	15
Texas-Dallas	9	22	Kent St	42	14

and Wisconsin. Since the whereabouts of some graduates are unknown and some of these unknowns are likely to be in foreign countries, these percentages may be understated.

Many of these programs may have high foreign placement because a higher percentage of foreign students are admitted. Clearly, a significant portion of doctoral students are from outside the USA. For example, (Cho, Roberts, & Roberts, 2008, p. 200) report that the percentage of Chinese students at the American Accounting Association Doctoral Consortium has been increasing in recent years and that over 25% of attendees during 2002–2004 received bachelors degrees from Chinese universities.

Some accounting doctoral programs may be more attractive to foreign students due to location or rank or some other factor. The data do not include a variable for country of citizenship. Clearly, however, a material percentage of accounting doctoral graduates are leaving the country, thus aggravating the shortage situation.

Industry Employment

Approximately 3% of all accounting doctoral graduates (1987–2006) are known to be employed outside of academia (see Table 9). Several programs with at least 20 graduates have about 10% or more of graduates who have left academia. These include Columbia, Chicago, Ohio State, Carnegie Mellon, Rochester, Texas-Arlington, NYU, and Northwestern. Since the employment situation of some graduates is unknown, these percentages may be understated. The fact that prior conventional wisdom suggests that no market exists outside of academia for accounting doctoral graduates (Fogarty & Saftner, 1993b, p. 428), the 3% average is interesting as are the programs with more significant numbers of graduates who are known to be employed outside of academia.

Graduate Appointments

In addition to moving up through the usual academic ranks, some graduates are appointed to administrative positions, such as department head, director, assistant or associate dean, dean, provost, and president. Others earn endowed positions, such as a chair professorship, eminent scholar chair, or named fellowship. Since these positions may require and reward different skill sets and performance, they are considered separately.

Table 9.   Graduate Employment, Programs With Above Average
Industry Placement.

Program	Total	Industry (%)
Cleveland St	14	35.7
WUSL	15	20.0
Columbia	31	19.4
Carnegie Mellon	23	17.4
Case Western	19	15.8
Chicago	35	14.3
Ohio State	50	12.0
Rochester	27	11.1
Texas-Arlington	27	11.1
South Florida	19	10.5
Union-NY	10	10.0
NYU	41	9.8
Northwestern	31	9.7
GWU	23	8.7
CUNY Baruch	24	8.3
UCLA	12	8.3
Wash St	38	7.9
Utah	27	7.4
Drexel	31	6.5
Penn St	63	6.3
LaTech	51	5.9
NCarolina	36	5.6
Southern Cal	36	5.6
Washington, U of	55	5.5
Harvard	19	5.3
Indiana	45	4.4
Florida	47	4.3
Michigan	52	3.8
Oregon	27	3.7
Oklahoma	28	3.6
Purdue	29	3.4

Administration

Approximately 9% of all accounting doctoral graduates from 1987 through 2006 hold administrative positions as shown in Table 10. These positions include department head or school director, program director, assistant or associate dean, dean, associate vice president or provost, vice president or provost, and university president.

Of the programs with at least 20 graduates during the study period, five programs have 20% or more of their graduates holding administrative

Table 10. Graduates in Administration.

Program	Head	Program Director	Asso/Asst. Dean	Dean	Higher Admin	Total	Percent Admin
Miss	12	1	0	4	0	70	24
Minnesota	4	0	0	1	0	22	23
Utah	3	1	2	0	0	27	22
Okla St	8	1	0	0	0	42	21
Mich St	10	0	2	0	0	60	20
St. Louis	3	0	0	0	1	21	19
LaTech	9	0	0	0	0	51	18
Houston	7	1	1	1	0	59	17
LSU	5	0	2	1	0	49	16
Oregon	3	0	0	0	1	27	15
Kentucky	10	0	0	0	0	69	14
TX Tech	6	0	0	0	0	44	14
Memphis	4	0	0	1	0	38	13
Arkansas	4	1	0	0	1	46	13
Columbia	2	0	2	0	0	31	13
Va Tech	6	2	0	1	0	70	13
TX A&M	9	0	1	1	0	87	13
Alabama	4	0	0	1	0	41	12
Wisconsin	6	1	1	0	0	68	12
GA State	4	0	0	1	0	43	12
Nebraska	7	0	0	0	0	61	11
Maryland	3	0	0	0	1	35	11
TX-Arlington	1	0	0	1	1	27	11
VCU	2	0	2	0	0	40	10
Drexel	2	0	1	0	0	31	10
Michigan	3	0	0	2	0	52	10

positions in 2007. These include, in order of percentage rank, Mississippi, Minnesota, Oklahoma State, Utah, and Michigan State. Four additional programs with at least 20 graduates during the study period have over 15% of their graduates holding administrative positions. These programs are St. Louis, Louisiana Tech, Houston, and LSU.

Perhaps some doctoral programs either provide better training in leadership or attract applicants who are more likely to hold administrative positions in their future (or both). This may warrant further investigation.

Endowed Positions
Approximately 8% of all accounting doctoral graduates from 1987 through 2006 hold endowed positions (see Table 11). These positions include chair

Table 11. Graduates Holding Endowed Positions.

Program	Graduates Endowed	Total Graduates	Percent
Michigan	11	52	21.2
Arizona State	11	60	18.3
Minnesota	5	28	17.9
Texas Tech	7	44	15.9
Indiana	7	45	15.6
Texas-Arlington	4	27	14.8
Alabama	6	41	14.6
Washington, U of	8	55	14.5
Penn St	9	63	14.3
Rochester	4	28	14.3
Chicago	5	36	13.9
Tennessee	6	44	13.6
Cornell	4	30	13.3
Arizona	8	64	12.5
Ohio State	6	50	12.0
North Texas	7	59	11.9
Iowa	4	34	11.8
Mich St	7	60	11.7
Florida St	5	45	11.1
Missouri	4	36	11.1
NCarolina	4	36	11.1
Utah	3	27	11.1
Miss St	5	47	10.6
Miss	7	70	10.0
Illinois	7	72	9.7
Columbia	3	31	9.7
Northwestern	3	31	9.7
Okla St	4	42	9.5
Georgia	6	64	9.4
Texas-Austin	7	78	9.0
Wisconsin	6	69	8.7
Florida	4	47	8.5
Stanford	3	37	8.1
LaTech	4	51	7.8
SCarolina	4	54	7.4
Penn	2	28	7.1
Southern Illinois	2	28	7.1
Nebraska	4	61	6.6
Arkansas	3	46	6.5

professorships, eminent scholar chairs, and named fellowships. Perhaps some doctoral programs either provide better training in the skills needed to perform at a level to obtain an endowed position or attract applicants who are more likely to hold endowed positions in their future (or both).

Of the programs with at least 20 graduates during the study period, two, Minnesota and Michigan, have over 20% of their graduates holding endowed positions in 2007. Three more programs are over 15%: Arizona State, Texas Tech, and Indiana. Ten additional programs are over 10% on this endowed position measure: Rochester, Texas-Arlington, Alabama, Washington, Chicago, Penn State, Tennessee, Cornell, Arizona, and Iowa.

SUMMARY AND CONCLUSION

This chapter provides descriptions of accounting doctoral programs on a wide range of characteristics. Doctoral programs can be differentiated on more variables than just research productivity and initial placement. Doctoral programs vary widely in the rate at which doctorates are conferred on women and minorities. They also vary widely in the placement of graduates according to Carnegie classification, AACSB accreditation, and accounting degrees awarded by employing institutions. Doctoral programs also differ in the extent to which their graduates leave the USA, work in industry, are appointed to administrative positions, and hold endowed positions.

Most doctoral programs, particularly the large ones, are shrinking. New programs have been created but are not able to provide enough graduates to keep up with the decline in graduates from established programs. Clearly, the creation of new programs, alone, is not a sufficient solution to the shortage problem facing accounting academia.

Contribution

This study's purpose was to provide prospective doctoral students, doctoral program directors, search committees, and other interested parties with comprehensive information that has not been previously available about doctoral programs in accounting. Doctoral program applicants may be interested in the history of programs with regard to many factors, including graduate rates of women and minorities, as well as further characteristics of graduates' employment and success. Hopefully, this information will assist potential applicants to doctoral programs in making decisions about where to apply and which program to attend.

This information also may be useful for accounting doctoral programs desiring differentiation from other programs using objective data. In addition, this information may provide doctoral programs with some benchmarks against which progress over time can be compared. Search committees, accreditation agencies, and other external parties may use this data to help in benchmarking and comparison of programs.

Limitations and Future Research

This study does have some limitations. Some data are unknown, particularly, the employment situations of some graduates could not be determined (these were not used in the analysis). In addition, the employment information is analyzed at a point in time. This is both a weakness and a strength. It is a weakness because it is a snapshot in time and employment situations change, and a strength because it addresses employment situations for graduates at a range of 1–20 years post graduation rather than just the initial employment of each graduate. While a longitudinal study is beyond the scope of this project, in the future such a study may provide more insight into the movement and employment of doctoral graduates.

While this study provides interesting data and analysis, it also highlights areas that need more investigation. For example: Why are so many programs shrinking or closing? More specifically, why are the larger established programs shrinking? Is shrinkage in the larger more established programs due to lack of qualified applicants, lack of funding, or some other reason? Should current programs increase the number of students admitted? Are programs admitting significantly more students but incurring high attrition? Why are some programs able to attract more females or minorities? Why do so many of the graduates of some programs leave the USA? How do applicants decide which doctoral programs to attend? What makes graduates of some programs more likely (or perhaps more qualified) to serve in administrative positions? Investigating these questions may lead to answers that help alleviate the continuing shortage of accounting doctorates.

NOTES

1. Note that difficulty in distinguishing the data between the African-Americans and African citizens may introduce a very small number of miscategorizations. In the cross-check of this data, graduates were presumed to be foreigners if their prior degree(s) were from African universities.

2. Minority status for the purpose of this chapter is limited to African-Americans, Native Americans, and Hispanic Americans. These are the groups identified as underrepresented by the PhD Project. Asian-Americans, who are not separately identified in this dataset, are not underrepresented in accounting academia.

3. Any level of AACSB accreditation (bachelors/masters, business/accounting) of the employing school was acceptable for this variable.

4. Currently, 568 schools are accredited by the AACSB. 103 of these schools are located outside the United States (AACSB International, 2009). The unaccredited schools employing U.S. accounting doctoral graduates range from large state universities, to regional and local colleges, to private religious colleges, to foreign universities. The range is too broad to suggest a pattern or concentration.

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INCREASING STUDENT AWARENESS OF THE ACCOUNTING PROFESSION: UTILIZING ACCOUNTING CAREER PANELS AS A COCURRICULAR STUDENT ACTIVITY

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ABSTRACT

This chapter discusses the utilization of professional accounting career panels as a cocurricular student recruitment and development activity. These career panels provide an opportunity for students to interact with the members of our Accounting Advisory Council and recent accounting graduates to learn more about the accounting profession and the career opportunities available to accounting majors. We address two questions in this chapter: (1) Can professionals be used to better inform students about the accounting profession? and (2) Can this approach be used to increase the degree to which students will consider accounting as a major? The analysis of the responses to questions elicited in the postcareer panel questionnaire indicates that students learned a significant amount

from the experience. In addition, the data show that students from principles-level accounting courses who participated significantly increased the degree to which they would consider accounting as a major.

Corporate accounting scandals such as those of Enron, WorldCom, and Tyco have placed accountants to a greater degree in the public eye and have prompted questions about their professional responsibilities. The resulting Sarbanes-Oxley legislation has increased the role accountants play in establishing controls in the reporting environment and has changed the scope of their work in both public and corporate accounting. Recently, the Troubled Asset Relief Program, housing crisis, and stock market decline have cast a cloud on the financial sector. These events have increased student awareness of the accounting profession, and as a result, an increase in student interest in learning more about accountants. In *Issues Statement No. 4, Improving the Early Employment Experience of Accountants*, the Accounting Education Change Commission (AECC) recommended that students should:

- Seek opportunities to obtain first-hand knowledge of the business world and practice environment.
- Obtain information about career opportunities and the job search (AECC, 1993, p. 2).

Accounting departments can help students achieve these objectives by facilitating their interaction with accounting professionals. Linking students with professionals can enhance students' abilities to network and increase their knowledge of the profession, stimulate interest in the profession, and facilitate their transitions from college to the "real world." Indeed, increasing this interaction is even more important than ever given the recent changes in the accounting environment that have resulted in a more complex professional workplace. Several articles describe mentor programs used by universities to link students with professionals in a one-to-one relationship to provide this knowledge and/or as a tool to encourage students to major in accounting (Wilburn, Amer, & Kilpatrick, 2009; Weinstein & Schuele, 2003). However, these articles point out that the costs of establishing one-to-one mentor relationships is relatively high.

The purpose of this chapter is to discuss an efficient approach to link accounting professionals to a large number of accounting students through utilizing professional accounting career panels as a cocurricular student development and recruitment activity. These career panels provide an

opportunity for students to interact with the members of our Accounting Advisory Council (AAC) and recent accounting graduates to learn more about the accounting profession and the career opportunities available to accounting majors. We address two questions in this chapter:

1. Can professionals be used to better inform students about accounting career choices?
2. Can this approach be used to increase the degree to which students consider accounting as a major?

This chapter is organized as follows: the second section provides background information regarding student supply and demand, and perceptions of the profession. The third section describes how we use professionals from our AAC to inform students about the accounting profession. The fourth section presents the methodology and data collection process and the fifth section discusses the analysis of the data and the results. The last section provides a summary and conclusions.

BACKGROUND INFORMATION

Student Supply and Demand

Not long ago accounting enrollments were declining. In fact, the opening paragraph of the foreword in the American Accounting Association (AAA) monograph on the perilous future of accounting education stated:

> We are experiencing decreases in student enrollments and we still hear continued criticisms of our educational programs. (Albrecht & Sack, 2000, p. vii)

However, recent trends indicate that currently accounting enrollments nationwide are increasing. The most recent survey published by the American Institute of Certified Public Accountants (AICPA) identifies trends in accounting enrollment, number of graduates, and hiring through the 2007–2008 academic year (Reigle, Bunning, & Grant, 2009). Among key findings are accounting enrollments continue an upward trend across all degree programs, and the number of total graduates is at the highest number since the survey began in 1971–1972 and is up over 20 percent compared to 2003–2004. Until recently, respondent schools generally anticipated a continuing rise in enrollments, but predictions of future enrollments are now markedly different with lower enrollments expected from 41 percent of respondents at the bachelor's degree level and 22 percent at the master's level.

Demand for graduates has also increased until recently, with hires reported by CPA firms for 2007 up an astounding 83 percent over 2004 (Reigle et al., 2009, p. 41). However, the recession has impacted the demand for accounting graduates as noted in the AICPA report, "Hiring by CPA firms started strongly but tailed off considerably as the economy deteriorated in 2007–2008. Fall of 2007 was reasonably robust; however, as economic conditions worsened, hiring began to slow substantially in the spring" (Reigle et al., 2009, p. 8). Furthermore, 2008–2009 forecasts for hiring are expected to be the same (64 percent of respondents) or lower (26 percent) compared to the most recent year.

Recent data for the class of 2009 from the National Association of Colleges and Employers (NACE) confirms the impact of the recession on hiring. The percentage of all college seniors who received at least one job offer was 40 percent, down from 50 percent in 2007–2008, and only 19.7 percent of students who applied for a job had secured a position before graduation compared to 51 percent in 2007 (NACE, October 2009, p. 2). These surveys were for all graduating seniors, but anecdotal evidence from our own experience for the most recent semester also indicates a recruiting slowdown. However, the good news for accounting is that graduates at the both the bachelor's and master's degree levels are in the top five on the list of degrees in demand (NACE, November 2009).

Perceptions of the Profession

Past research indicates that students have a poor perception of the accounting profession and a general lack of understanding about the profession. The AICPA commissioned the Gallup organization to conduct a survey of 1,000 high school and 1,000 college students regarding the choice of accounting as a major and profession. The survey found that both high school and college students rated accounting the lowest among six professions (medicine, law, teaching, engineering, financial planning, and accounting) in their overall impressions of each profession (Gallup, 1991). Additionally, the study reported that 37 percent of the students could not provide an explanation of what accountants do. Students did not realize that accounting involves working with people or that accountants give business advice. As a follow-up, the AICPA commissioned the Taylor Research and Consulting Group to conduct a similar survey. The survey found that (1) most students were ignorant of the basics of an accounting career, (2) much of the student information regarding accounting is limited

or faulty, and (3) students associate accounting with money, numbers, math, and taxes, which are not usually viewed as positive attributes by the students (Taylor Research and Consulting Group, 2000).

Other research supports the results from the above surveys (for example, see Marriott & Marriott, 2003; Karnes, King, & Hahn, 1997; Cohen & Hanno, 1993; Inman, Wenzler, & Wickert, 1989; Zeff, 1989). However, much of the research about students' perception of accounting was conducted before the major economic crises of the 2000s and the dramatic press the profession has received since that time. Although students at our university appear to have an increased awareness of the importance of accounting and we have experienced increased enrollments in our accounting program, students still have misconceptions about the accounting profession.

Regarding career paths within accounting, research indicates that public accounting has a poor image with many college students. Nouri, Parker, and Sumanta (2005) utilized an anonymous in-class survey of accounting majors at the end of their junior year to investigate how they view work in public accounting relative to other accounting areas. Their results suggest that students perceive that public accounting has lower job security, job autonomy, and benefits than other accounting areas. Students also perceive that public accounting jobs involve more travel, overtime, job feedback, variety, a higher task identity, and a stronger professional image. Additionally, students who prefer careers other than public accounting believe that public accounting is not conducive to family life.

In identifying approaches to address student misconceptions regarding the accounting profession, we first should understand why students select accounting as a major. The most important selection factors for students who choose to pursue an accounting major include good job opportunities, high earnings potential, and interest in the field (Adams, Pryor, & Adams, 1994; Felton, Buhr, & Northey, 1994). Additionally, Cohen and Hanno (1993) identify success in introductory courses, skills and background in math, and the workload in accounting courses as factors that affected the choice of accounting as a major. Similar to research on students' perception of accounting, much of this research was conducted before the extensive publicity the accounting profession has received in the past decade. In spite of limitations that may exist in relying on dated sources, ad hoc discussions with students at our university indicate that these factors still appear relevant to today's students in selecting accounting as a major. In addition, the more recent events mentioned above keep the financial world in the news.

Hermanson et al. (1996) and Garner and Dombrowski (1997) surveyed accounting program administrators and present the *perceptions* of

department chairs as to the most effective strategies for recruiting top students into accounting programs. The perceived most effective strategies include personal contact with faculty as well as with current students and alumni, lobbying efforts and the use of Ph.D.s in introductory classes, educating students on career opportunities, scholarships, high school and two-year college recruiting, strong placement of graduates, and reputation of school/program. This literature also suggests a solution using practicing professionals as a resource to inform students about the opportunities in accounting. Further, these authors suggest using professionals not just in educating declared accounting majors, but also in attracting students from a broader audience into the major, especially those students in their first two years of college who are still in the process of selecting their major. A limitation of both studies is that the *actual* effectiveness of these strategies is not evaluated.

THE USE OF ACCOUNTING PROFESSIONALS: ADVISORY COUNCILS

Our accounting faculty decided to enlist the assistance of professionals to address the problems of a lack of information and the misinformation about the accounting profession and of the difficulties students face in making informed career choices. Accordingly, we collaborated with the members of our AAC and recent accounting graduates to present career panels as a cocurricular student development and recruitment activity (for a review of the current and best practices of advisory boards see Baker, Karcher, & Tyson, 2007). These career panels provide an opportunity for students to interact with professionals to learn more about the accounting profession and the opportunities available to accounting majors.

Our AAC is an advisory board comprised of 16 members, all of whom are established accounting and business professionals from the region of the country served by our university. The members include representatives from public accounting, government, and industry. Some are alumni of our program and all have significant professional experience.

During the first few years of its existence, our AAC focused on helping us define our program's mission statement, and review and improve our curriculum. Having made a significant contribution to our program in these areas, the faculty determined that we could utilize the members of the council to inform our students about the accounting profession. Although

we have a Beta Alpha Psi chapter at our university in which student members can interact with professionals, interaction is generally limited to office tours of specific firms or presentations during meetings by the professionals on various technical topics. Therefore, our faculty and AAC members generated the idea to involve the members of the council and other accounting professionals in presenting accounting career panels for our students. The objectives of these career panels are (1) to use professionals to better inform students about the accounting profession and (2) to increase the degree to which students will consider accounting as a major.

METHODOLOGY AND DATA COLLECTED

In this section of the chapter, we describe the approach used to present the professional accounting career panels and collect feedback from the students regarding the panel sessions. Specifically, we discuss planning the event with respect to participation by faculty and students, conducting the event with respect to the structure of the panels and sessions, and the survey instrument.

Planning the Event: Participation by Faculty and Students

Accounting faculty members volunteer to assist with the logistics of the panel sessions. Two members of the faculty are assigned to each panel; one serves as moderator and one serves as facilitator. The moderators introduce the panel members to the students at the start of each session and call on students to ask questions. The facilitators direct students to the assigned rooms, distribute surveys to the students, escort the panels of professionals to the appropriate room for each session, and collect the surveys from the students at the end of the final session.

During the initial planning of this event, members of our AAC expressed concern that student attendance at the panel sessions might be low. Therefore, accounting faculty provide incentives for student attendance. In all junior- and senior-level accounting courses, faculty members include attendance at the panel sessions as a course requirement worth approximately 2 percent of the course grade. The capacity of the classrooms used for the junior and senior groups is sufficient to hold all students. However, the auditorium used for the accounting principles student group has capacity constraints that limit participation; therefore, we require these students to "sign up" in advance in order to attend. In general, we give first priority to

students who indicate an interest in accounting as a major, second priority to business majors, and finally to any student. Rather than including attendance at the panel sessions as a required part of the principles' course grade, we offer all principles students an *optional* extra credit career assignment worth approximately 2 percent of the course grade, with one of the options being attendance at the accounting career panel discussions. We allow students who are unable to attend the sessions to complete an alternative career assignment to fulfill junior- or senior-level course requirements or to earn extra credit for the accounting principles classes.

Faculty members solicit questions in advance during their regular classes from each group of students in order to encourage lively panel sessions. The faculty moderator for each class level reviews the questions from that group in order to identify several of the best questions to be used as "seed" questions to start each session. The survey form to solicit the questions states:

> In order for the session to provide the most benefit to students, we would like to develop a list of questions from our students to ask the panel. Please write one or two questions below that you are interested in asking accounting professionals.

After compiling a list of questions, faculty members return the survey forms to the students so they have their questions available during the panel session. Although only a few questions are chosen as seed questions, all students have the opportunity to ask their questions during the open-question portion of each session. We provide the list of questions in advance to the panel members in order to allow them to formulate their answers.

Students at each level generally provide a rich and thoughtful set of questions for our panel sessions. The questions for one sample year are listed in Table 1; our experience is that questions tend to be similar from year to year. Questions from the freshman/sophomore accounting principles students primarily address learning about what accountants do and should assist them in making informed decisions about becoming accounting majors. Questions from the juniors also relate to career opportunities, as well as the accounting curriculum and internships. Questions from the seniors primarily address interviewing, career strategies, and new developments in the accounting profession.

Conducting the Event: Structure of Panels and Sessions

We hold the accounting career panels early in the fall semester in order to precede the time when the majority of prebusiness students choose their

Table 1. Sample Student Questions.

Freshman/sophomore-level accounting principles students:
1. What is the most challenging aspect of being an accountant?
2. Why did you get into accounting?
3. Has your knowledge of accounting provided you with an advantage in the new economy?
4. What can you do with an accounting degree besides being an accountant?
5. What is a typical day in the life of a CPA?
6. Do accountants encounter a lot of fraud? If so, how often?
7. Do you like your job as much now as you did when you started?
8. What kind of job satisfaction do you have with your current position?
9. Should students participate in an internship or externship? What are the differences between the two?

Junior-level accounting majors:
1. Give us an outline of how you spend your days.
2. How does your job as an accountant go against the general stereotype of an accountant (pocket calculator, always at a desk crunching numbers, anti-social)?
3. What other business aspects (management, finance, economics) do you face daily besides accounting?
4. What is the greatest challenge you face in your career?
5. What additional training do we need to supplement our college education?
6. If most accounting firms use advanced accounting software in today's world, do you still feel taking all the accounting classes we are taking is necessary? Or is it necessary to have more computerized accounting classes that cover these types of accounting software?
7. What would you do differently in terms of your academic career if you could do it over again?
8. Are internships important to your firm? If so, what learning opportunities do you offer an intern?
9. What qualities best catch your eye when hiring for internships and full-time positions?

Senior-level accounting majors:
1. What changes do you see in the accounting profession and how would you advise accounting students to prepare for those changes?
2. How can I be best prepared for an interview? What are the starting salaries?
3. How beneficial is it to get a master's degree (distinguish between general MBA or specific master in a certain field). Should you get your masters before you go to the workforce or after gaining some work experience?
4. List some new developments and growth areas in your firm. Also name the importance of information technology in your company.
5. How important is one's GPA when looking for employment?
6. Describe a day in the life of a CPA.
7. What areas outside of accounting would you recommend we focus on?

major and when accounting majors interview for jobs and internships and preregister for classes for the following semester. Holding the panel discussions early in the semester also provides information to our new accounting majors early in their program. The panel discussions are

convened in our College of Business building on a Friday afternoon, which minimizes conflicts with other classes or activities.

We organize our AAC members and recent graduates into three panels, each consisting of four to five professionals. The panels are comprised of public accounting, industry/government, and young professionals. We divide our students into groups based upon their class rank: accounting principles students (primarily freshmen and sophomores), junior-level accounting majors, and senior-level accounting majors. Grouping the students by class rank allows the discussion in each room to be tailored toward the topics that are most relevant to the students in each group. We assign each of the three student groups to a specific classroom and they remain in that room for all sessions. Each of the three panels of professionals rotates between the three rooms, which allow all students to hear from professionals on all of the panels.

We provide a sample schedule for the event in Table 2. We hold three panel sessions, each lasting approximately 25 min with a 5 min break between sessions. During the first 10 min of each session, the faculty moderator in each room introduces panel members to the students and each panel member answers the seed questions in order to start discussions. During the last 15 min of each session, the panel members answer additional questions posed to them by individual students. At the conclusion of the third session, we host a reception in the lobby outside of the classrooms to facilitate networking between students and professionals.

Table 2. Sample Schedule for Accounting Career Panels.

Time	Activity
12:30–1:45	Lunch (AAC members, additional professional panelists, faculty and administrators); career panel overview
1:45–2:00	Break; faculty members escort panelists to rooms
2:00–2:25	Career Panel Session 1
2:25–2:30	Break; students remain in their respective classrooms; faculty members escort panelists to second classroom
2:30–2:55	Career Panel Session 2
2:55–3:00	Break; students remain in their respective classrooms; faculty members escort panelists to third classroom
3:00–3:25	Career Panel Session 3
3:30–4:30	Mixer/reception for professionals, students, and faculty

Survey Instrument

A survey instrument is used to collect data regarding student perceptions of the value of the career panels and to serve as a record of student attendance. Two variations of the survey are used, one for accounting principles students and one for the juniors and seniors. These instruments are presented in the Appendix. The faculty facilitator for each session distributes the survey to students as they enter the classroom. At the conclusion of the last panel session, the faculty facilitator and moderator collect the surveys from the students as their ''ticket out'' of the room in order to ensure that students would remain in attendance through all three panel sessions. Because we use the survey as a record of student attendance, it is not completely anonymous which may result in a potential response bias. We do not believe any such response bias would dramatically influence student responses. Moreover, all surveys are immediately delivered to the Accounting Department Chair to compile the survey data. Individual professors receive only the student attendance list and summary data.

The survey contains two parts: prepanel question(s) and postpanel questions. The faculty moderator instructs students to answer the pre-panel questions prior to the start of the first session and to answer the postpanel questions after the last session. The prepanel and postpanel questions allow us to capture any change in students' perceptions of accounting as a major resulting from the panel discussions. The survey includes several open-ended questions as well as questions to which students respond on a 10-point scale. The questions elicit students' perceptions as to the overall value of the career panel discussions, the amount they learn about career opportunities, and the amount they learn about the accounting profession.

ANALYSIS AND RESULTS

The authors collected and analyzed data in order to address two questions: (1) Can professionals be used to better inform students about the accounting profession? and (2) Can career panels be used to increase the degree to which students will consider accounting as a major? The results presented in this section are organized according to these two questions. We also discuss several specific issues identified by students regarding how we can improve the career panel experience and actions we have taken to address those issues.

Can Professionals Be Used to Better Inform Students About the Accounting Profession?

To address this question, we analyzed and report data from all three groups of students who participated in the career panel discussions: students in principles-level accounting courses, junior-level accounting students, and senior-level accounting students. Responses were combined from the junior-level and senior-level accounting students for this analysis. Seventy-nine students from our principles-level courses and 103 junior- and senior-level accounting majors attended the career panel discussions.

The results from the responses to three of the questions administered in the postcareer panel questionnaire indicate that students perceived the panel discussions to be of high value and that they learned a significant amount about career opportunities and the accounting profession from the experience. These results are presented in Table 3. The mean response to all questions was approximately 8 on the 10-point scale where 10 represents "extremely valuable" or "learned a great amount."

Table 3.   Results from Survey Questions on Informing Students About the Accounting Profession.

	Accounting Principles Students	Junior and Senior Accounting Majors
Question: Please circle the number on the following scale to indicate your perception as to the overall value of the panel discussions: 1 = not at all valuable to 10 = extremely valuable.		
Mean	8.13	8.58
Median	8.00	9.00
Standard Deviation	1.65	1.52
Question: Please circle the number on the following scale to indicate your perception as to how much you learned about career opportunities during the panel discussions: 1 = learned nothing to 10 = learned a great amount.		
Mean	7.77	8.20
Median	8.00	8.00
Standard Deviation	1.87	1.64
Question: Please circle the number on the following scale to indicate your perception as to how much you learned about the accounting profession during the panel discussions: 1 = learned nothing to 10 = learned a great amount.		
Mean	8.05	7.94
Median	8.00	8.00
Standard Deviation	1.64	1.53

Our evaluation form also asked students "Did your perception of the accounting profession change based upon the knowledge you gained today?" Seventy-six percent of our principles students responded, "Yes," and 40 percent of our junior- and senior-level accounting majors responded, "Yes." Student responses to two follow-up questions, "How did your perception change?" and "What was the most important thing you learned during the panel discussions?" fell primarily into three categories as indicated by the following sample responses:

1. *Accounting is a diverse and flexible discipline*:

   I learned that accounting is a much more flexible field than what I previously thought (which was just having your head in the books all the time). Also, I learned that you don't have to go into public accounting.

   I've learned that the accounting profession is more diversified than I had expected, and that there are boundless opportunities.

   The importance of accounting as the foundation on which businesses are built and how tightly it integrates into all facets of business organizations.

   That accounting analytical skills and a CPA can further your position in the business world, even if it is not accounting (flexibility).

   The traditional accounting job is changing as technology changes. The accounting professional now has choices and does not have to stay in the traditional roles.

   Seeing the diverse job descriptions. No two days are the same.

2. *Accounting is not just number crunching without personal interaction*:

   I viewed accountants as being dull and boring. I now view them as energetic, outgoing, and highly motivated people. The most important quality to have when entering the workplace is communication skills.

   I always thought that the profession was very individual. I found in fact that you do work in groups.

   The 'Bean Counter' image without interaction with others was false, especially in big firms.

   I now realize that accounting isn't just sitting at a desk and crunching numbers. There is more networking and communication needed.

   It's not what I thought it was. The job is not all journal entries and bookkeeping. Most of it is dealing with other people.

3. *Accounting is a challenging and rewarding profession*:

It is a challenging career, but very rewarding as well.

Accounting is a continuous learning process that is stressful, yet extremely rewarding; life is to be lived as a balance. The financial and personal rewards surrounding accounting professions.

Responses to these questions from juniors and seniors indicated that the panel discussions confirmed their decisions to major in accounting and improved their knowledge in what to expect after graduation:

Even though I was very sure about accounting before I came, I am now more excited about my major and what my future holds for me. I realized that accounting isn't as dull as people outside the profession look at it. It is an exciting but hard major that takes you into interesting opportunities in many different companies. Even though you have an accounting degree or a CPA, you have the opportunity to do other things such as finance, marketing, and economics.

Every time I hear more about accounting and the field, I am more sure I want to pursue this degree.

Seeing someone [the junior professionals] that looks, acts, and was 'me,' succeed was helpful. Being a student is hard and sometimes scary so seeing a peer who had made it was fantastic.

I learned that is takes a well-rounded individual to land good accounting jobs. It makes me want to make the most of my education.

Maybe it's not so much my perception, but I feel a lot more comfortable about the next step after graduation. I don't feel like I have to know 'everything.'

Can Career Panels Be Used to Increase the Degree to Which Students Consider Accounting as a Major?

To address this question we analyzed the responses elicited from the accounting principles students, who are primarily freshmen and sophomores. As noted earlier, these students have not yet chosen a major course of study within the university. Accordingly, the information they gathered during the career panel discussions could affect their selection of a major.

We analyzed these students' responses to the same question posed at both the beginning and the end of the panel discussions, which allowed us to capture any change in students' perceptions of accounting as a major. Table 4 presents the results of these responses. We conducted a pair-wise

Table 4. Results From Prepanel and Postpanel Questions on the Degree to Which Principles-Level Students Were Considering Accounting as a Major.

Prepanel Question: Before coming to the discussions, to what degree were you considering accounting as a major? 1 = not at all considering to 10 = very strongly considering.	
Mean	3.65
Median	4.00
Standard Deviation	2.07
Postpanel Question: After attending the discussions, to what degree are you considering accounting as a major? 1 = not at all considering to 10 = very strongly considering.	
Mean	4.65
Median	5.00
Standard Deviation	2.74

t-test on the responses to these two questions. The results of the one-tailed analysis indicated that students significantly increased the degree to which they would consider accounting as a major ($p < .001$). The data also revealed that 45 percent of freshman and sophomores increased the degree to which they would consider accounting as a major as a result of attending the career panels while only 4 percent decreased the degree to which they would consider accounting as a major. Fifty-one percent indicated no change in the degree to which they would consider accounting as a major. These results are encouraging in that the experience positively influences student opinions.

Additional Student Feedback

We also asked students in the survey for their suggestions as to how we could improve the accounting career panel experience. Overall, the majority of students were very pleased with the experience but expressed concerns on a few issues.

Two primary issues have arisen for the principles-level students. First, in the earlier years accounting was the only business major offering career panels, and some principles-level students expressed the desire to have career panels for other business majors. Due to the success of the accounting panels, our college administration worked with faculty of other majors to begin offering annual career panels as well. The other primary issue for principles-level students arose because they were grouped in a large auditorium and some students were there only to earn the extra credit and

caused distractions for other students. We have addressed this issue in several ways: by faculty communicating behavioral expectations to students, by more diligently applying the priority system for student signups to allow the more interested students as first priority, and by implementing a ticket system that requires students to obtain a ticket by signing up in advance and then present the ticket to enter the session. The ticket system communicates to students that this is a special event and also ensures that all students who enter the auditorium have a seat and reduces distractions from the ''standing-room only'' crowds that we experienced in some years.

Junior- and senior-level students have expressed other issues regarding the career panels. One issue was they believed there were too many students in each room and the panel sessions were too short which made it difficult for many students to be able to ask their questions. Another issue was that students wanted to hear from different panelists from year to year; this issue resulted because the event has been sponsored by our AAC and the professionals enjoyed participating as panelists every year. We have addressed these issues primarily by splitting the upper division accounting majors into three rooms based upon anticipated graduation date and changing the structure of the panel sessions to have two sessions each lasting 40 min rather than three sessions each lasting 25 min. Also, rather than having each of the three professional panels speak in each room, we now have four panels who each speak in only two of the four rooms. Expanding the number of panels has provided the Department Chair flexibility in recruiting additional professionals to increase panel diversity. Reducing the number of classrooms for each panel has allowed the Department Chair to minimize the occurrence of the same professionals speaking to the same students in subsequent years through careful scheduling of the professionals.

SUMMARY AND CONCLUSIONS

The objective of this chapter is to discuss the approach of utilizing professional accounting career panels as a cocurricular student development and recruitment activity and to determine if such an approach would inform students about the accounting profession and increase the degree to which they would consider accounting as a major. The results of an analysis of student perceptions elicited on a survey questionnaire indicate that students learn much from participating in the panel discussions and find the sessions to be highly valuable. In addition, students in our principles-level courses are significantly positively affected to consider accounting as a major.

Written comments provided by the student participants indicate that their perceptions of the accounting profession are positively affected. Principles-level students learn that accounting is a diverse and flexible discipline, is not just number crunching without personal interaction, and is a challenging and rewarding profession. Our junior- and senior-level accounting students state that their decisions to major in accounting are confirmed and that their knowledge of what to expect after graduation is enhanced.

Our experience with this endeavor has been positive. The faculty and administration are very pleased by the response of our students and feedback from our AAC members, who also enjoy the interaction they have with students. The career panels provide the professionals with an opportunity to get beyond some of the activities that typify many advisory council meetings and interact directly with our students. In fact, the experience has been so positive that we have more professionals than needed to staff this event. Professionals mark this event in their calendars and continue to volunteer to participate.

Implications

A number of important implications related to this program should be highlighted. First, though our experience has been positive, we realize the initiative has costs. First, this type of event results in significant administrative costs. The Department Chair and other department leaders typically bear these costs. Second, all faculty members must make a commitment to support these efforts by participating as moderators and facilitators. In addition, faculty support is required for numerous miscellaneous tasks, such as collecting and screening student questions, making in-class announcements of the event, and recording student attendance. Third, the accounting professionals bear opportunity costs for their preparation, travel, and participation as panel members. Finally, the postdiscussion reception has catering costs.

Overall, we believe that the benefits of the initiative to the students outweigh these costs. Students benefit from the opportunity to learn more about the profession directly from those working in accounting. The professional participants are from a variety of industries and backgrounds which provides the students with a diverse set of opinions and insights. Casual observations by the authors indicate that during the postpanel reception, both students and professionals engage in deeper discussions about the work, professional environments, and career opportunities in different fields.

The success of the initiative has prompted thinking about how we could improve and enhance the experience. We have discussed ideas related to a number of features of the program, including how to organize the individual panels that convene in each room (e.g., by career path or by experience level), how to enhance the interactions between the professionals and students during the postpanel reception by incorporating networking activities, and including other activities such as mock interviews.

Future research efforts can concentrate on a number of questions and follow-up data collection. For example, the ideas for improvements and enhancements noted above could be implemented and data could be collected to evaluate their effectiveness. Additionally, follow-up data could be collected from the principles-level students who attended the career panels to determine whether they subsequently chose to major in accounting. Such a longitudinal approach could indicate the possible influence of career panel participation on the choice of accounting as a major.

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APPENDIX. SURVEY QUESTIONNAIRES USED
FOR THE DATA COLLECTION

Student Evaluation Form
Students in Principles of Accounting

Instructions:

The purpose of this form is to collect your perceptions as to the value of these panel discussions and to serve as a record of your attendance. Please do the following:

1. Complete the top section of the form now.
2. Complete the evaluation portion of the form toward the end of the panel discussions, after you have had time to develop some perceptions as to the experience.
3. Drop the form into the collection box at the back of the room as you leave after the last discussion.

Name_____SS#_____

Accounting Classes you are taking this semester
  (e.g., ACC 255 – list all that apply): _____

Accounting Instructors (list all that apply): _____

Prediscussion Questions:

1.   In what field of study are you considering a major degree? Please circle one of the following

   Accounting   CIS   Economics   Finance   Management   Marketing   Other

2.   **Before** coming to the discussions, to what degree were you considering accounting as a major?

   1   2   3   4   5   6   7   8   9   10
   Not at all   Very strongly
   considering   considering

Postdiscussion Questions

3.   Please circle the number on the following scale to indicate your perception as to the **overall value** of the panel discussions:

   1   2   3   4   5   6   7   8   9   10
   Not at all   Extremely
   valuable   valuable

4.   Please circle the number on the following scale to indicate your perception as to how much you learned about **career opportunities** during the panel discussions:

   1   2   3   4   5   6   7   8   9   10
   Learned   Learned a
   nothing   great amount

5. Please circle the number on the following scale to indicate your perception as to how much you learned about the **accounting profession** during the panel discussions:

    1   2   3   4   5   6   7   8   9   10

Learned   Learned a
nothing   great amount

6. Did your perception of the **accounting profession** change based upon the knowledge you gained today?

Yes   No
If yes, how did your perception change?

_____

_____

7. Now that you have been through the panel discussions, do you have any other questions that did not get answered?

_____

_____

8. What was the most important thing you learned during the panel discussions?

_____

_____

9. How could we improve this experience?

_____

_____

10. **After** attending the discussions, to what degree **are** you considering accounting as a major?

    1   2   3   4   5   6   7   8   9   10

Not at all   Very Strongly
considering   Considering

11. If you are more strongly considering accounting as a major, what one thing helped change your mind?

_____

_____

Accounting Advisory Council Panel Discussions
Student Evaluation Form
Juniors and Seniors

Instructions:
  The purpose of this form is to collect your perceptions as to the value of these panel
    discussions and to serve as a record of your attendance. Please do the following:

  1. Complete the top section of the form now.
  2. Complete the evaluation portion of the form toward the end of the panel discussions,
    after you have had time to develop some perceptions as to the experience.
  3. Drop the form into the collection box at the back of the room as you leave after the
    last discussion.

Name _____SS# _____

Accounting Classes you are taking this semester
  (e.g., ACC 255-list all that apply): _____

Accounting Instructors (list all that apply): _____

Prediscussion Questions:
1. **Before** coming to the discussions, how sure were you that you wanted to be an
     accounting major?

         1   2   3   4   5   6   7   8   9   10
       Not sure   Very sure

Postdiscussion Questions:
2. Please circle the number on the following scale to indicate your perception as to
     the **overall value** of the panel discussions:

         1   2   3   4   5   6   7   8   9   10
       Not at all   Extremely
       valuable   valuable

3. Please circle the number on the following scale to indicate your perception as to
     how much you learned about **career opportunities** during the panel discussions:

         1   2   3   4   5   6   7   8   9   10
       Learned   Learned a
       nothing   great amount

4. Please circle the number on the following scale to indicate your perception as to
     how much you learned about the **accounting profession** during the panel
     discussions:

         1   2   3   4   5   6   7   8   9   10
       Learned   Learned a
       nothing   great amount

5. Did your perception of the **accounting profession** change based upon the knowledge you gained today?

    Yes   No
    If yes, how did your perception change?
    _____

6. Now that you have been through the panel discussions, do you have any other questions that did not get answered?
    _____

    _____

7. What was the most important thing you learned during the panel discussions?
    _____

    _____

8. How could we improve this experience?
    _____

    _____

9. **After** the discussions, how sure are you that you want to be an accounting major?

       1   2   3   4   5   6   7   8   9   10
    Not Sure   Very Sure

10. If you are more sure about becoming an accounting major, what one thing helped change your mind?
    _____

VIRTUAL GROUPS IN A COST ACCOUNTING COURSE: GROUP DYNAMICS, OUTCOMES, AND PARTICIPANT SATISFACTION

Clement C. Chen, Keith T. Jones and Keith Moreland

ABSTRACT

This study examines the relative efficacy of groups in both virtual and traditional face-to-face courses, as well as differences in group dynamics between the two delivery methods. We surveyed students in online and traditional classroom sections of the same intermediate-level cost accounting course about their perceptions of group processes, general satisfaction with group work, learning outcomes, and group communications. Traditional classroom students were more positive about their group processes and learning outcomes than were online students. They also were more likely to agree that the learning benefits of group work outweighed the costs, (e.g., uneven and inefficient work distribution.) Our findings suggest that instructors who use groups in online courses should specifically consider the potentially negative effects of such factors as workload imbalances when designing group learning activities so that learning objectives are not adversely affected.

Online distance education programs are growing rapidly. According to data from the U.S. Department of Education, there were over 12 million enrollments in college-level credit-granting distance education courses during 2006–2007. The study further revealed that two-thirds of two-year and four-year degree-granting postsecondary institutions offered online or other forms of distance education courses, with 29 percent offering complete degree programs through distance education (U.S. Department of Education, 2008, pp. 6–10). Web-enhanced course delivery has led to the widespread use of online teams in education settings (Rainsbury & Malcolm, 2003, p. 49), undoubtedly owing to the realization by academia of the importance placed on teamwork skills by employers (Chen, Donahue, & Klimoski, 2004, p. 27). In groups associated with virtual courses, members use computer-mediated communication. Such communication is becoming common for virtual teams in dispersed organizations and other ventures (Kraut, Fussell, Brennan, & Siegel, 2002, p. 137).

Collaborative group work has become a prevalent teaching approach not only in traditional classes but also in distance education (Lewis, Shea, & Daley, 2005, p. 3). In her qualitative cross-case study, Smith (2005, p. 189) cited advantages of collaborative groups such as increased learner motivation, opportunities for adult learners to develop critical thinking and problem-solving skills, and the opportunity to construct new knowledge through sharing of ideas. There has been some research in the area of performance of groups associated with virtual courses, but the results are mixed (Berry, 2002, pp. 74–78; Liu & Burn, 2007, pp. 369–379; Michinov, Michinov, & Toczek-Capelle, 2004, pp. 27–39). Despite the wide use of collaborative groups in course work across disciplines, scant research has focused on the group dynamics (i.e., group processes and communications within the group) inherent in virtual teams.

The current study extends the literature by examining the relative perceived effectiveness of groups associated with virtual courses, using as a comparative baseline the perceptions of students in a traditional class of the same intermediate-level accounting course. The study examines several areas relative to how students carried out their group work and how they perceived the processes, satisfaction with group work, and learning outcomes. We find that the results related to group processes, learning outcomes, and satisfaction with group work generally favor the traditional classroom approach. Also, the results are consistent with anecdotal evidence suggesting that students generally do not perceive group work as relatively beneficial, regardless of the method of course delivery. Finally, students believe face-to-face communication is more effective than various electronic

forms, but the results indicate that e-mail is the most common method of intragroup communication.

PRIOR LITERATURE AND RESEARCH QUESTIONS

Extensive research centers on factors that affect satisfaction and group performance, primarily in traditional classroom educational environments. This research has examined group cohesion, commitment, effort, and attitudinal traits such as cooperation and aggressiveness (Bacon, 2005, pp. 248–267; Bento, 1997, pp. 137–144; Brandyberry & Bakke, 2006, pp. 195–209) and generally concludes that such factors can influence students' satisfaction with collaborative learning. Additionally, Carron and Spink (1995, pp. 86–105) examine the effect of group size on learning outcomes for groups in traditional classes using students enrolled in noncredit university-run aerobics classes. They find that, depending on the group size, collaborative team assignments can increase motivation, student satisfaction, and performance.

Online learning offers several advantages that make it ideal for collaborative learning (Brandyberry & Bakke, 2006, p. 207). The flexibility and convenience of asynchronous group meetings reduce the need to coordinate schedules to meet with group members (McConnell, 2000, p. 227). However, the empirical results of studies that focus on collaborative learning are mixed with regard to the performance of groups associated with virtual courses. For instance, Berry (2002, pp. 74–78) surveyed students in graduate marketing courses and concluded that groups associated with virtual courses were at least as effective as face-to-face groups. Conversely, Liu and Burn (2007, pp. 369–379) analyzed the group communications of undergraduate business students enrolled in an information system class. They found that face-to-face groups were more effective.

Prior research suggests that virtual teams need to overcome a variety of challenges in order to function effectively. For example, learners in groups associated with virtual courses are constantly confronted with communication, technology, and sociocultural issues in collaborative work (Walther & Bazarova, 2007, pp. 16–19). As a result, virtual teams often need to adapt and adjust, which can lower satisfaction and trust levels and lead to suboptimal performance (McFadzean & McKenzie, 2001, pp. 478–479). Further, the lack of nonverbal communication cues and communication spontaneity tends to lead to increased time needed to make decisions and reach consensus (Straus & McGrath, 1994, p. 94).

Some studies have examined qualitative information related to learners' experiences in groups associated with virtual courses. Smith (2005, pp. 182–199), examining data from graduate students in an adult learning course, suggests that small online groups demonstrate processes that are characteristic of individual growth and development and group individuation. Beer, Slack, and Armitt (2005, pp. 27–37) collected and analyzed data from occupational therapy students using online tutorial sessions. They suggest that students' shared presence helps collaboration and teamwork. Consistent with these results, Dewiyanti, Brand-Gruwel, Jochems, and Broers (2007, pp. 496–514) find that distance learners enrolled in five different undergraduate social science courses appreciate the opportunity to work collaboratively and are satisfied with collaborative learning.

There has been limited research focusing on collaborative learning in online courses involving technical topics such as accounting. Chen and Jones (2007, pp. 25–38) and Jones and Chen (2008, pp. 15–28) focused on blended learning in an MBA-level accounting course, in which a few on-campus meetings are held during the semester and the course is otherwise primarily online. Both of those studies found that MBA students in a blended-learning class had significantly better perceptions on a number of group-related issues than their traditional classroom counterparts. For instance, Chen and Jones (2007, p. 32) found that blended-learning students felt more strongly that group work enhanced their understanding of course materials and they were generally more satisfied with their group work. Similarly, Jones and Chen (2008, p. 21) reported that students in blended-learning classes believed more strongly that the interaction among group members was effective in achieving group goals, that decision-making processes were efficient, and that the group's output was of good quality.

No known study has examined whether individuals' satisfaction and perceptions of group outcomes differ between students enrolled in traditional classroom sections and online sections of the same accounting course. Further, the study by Berry (2002, p. 75) referred to earlier asked all students to communicate face-to-face for some tasks and to operate as a virtual group for other tasks, within a traditional classroom course. The courses involved in the current study differ only in delivery method (traditional versus online). Otherwise, the courses use the same instructor, assignments, weighting and grading schemes, and leave open the student choice of how best to plan and complete group assignments. The results will offer preliminary evidence as to whether students' satisfaction with their groups and outcomes differ in ways that are associated with the delivery method.

Because of the limited amount of research on collaborative projects in accounting classes, the mixed results of prior studies, and the uncertainty as to whether the results can be generalized to accounting courses, this study focuses on an intermediate-level cost accounting course typically required in U.S. accounting degree programs. Specifically, we consider the following two research questions:

RQ1. How do students' perceptions of group processes in online classes compare with those in traditional classes?

RQ2. Do perceptions of group outcomes differ between students in online and traditional classes?

Additionally, little research has examined the methods of communication most often used by students in carrying out group projects, and whether the preferred methods differ between delivery methods. Lancaster, Yen, Huang, and Hung (2007, pp. 5–22) surveyed 545 undergraduate management information systems students and compared their perceptions of e-mail and instant messaging. They found that undergraduate students perceived advantages of instant messaging over e-mail in terms of building relationships, conveying emotions, and ease of use. However, instant messaging was favored only for personal and social relationships, while e-mail remained the preferred method for work-related communications.

In another study of student-to-student interaction, Madge, Meek, Wellens, and Hooley (2009, pp. 141–155) examined the impact of Facebook upon first-year undergraduate students' social networks at a British university. While the students believed Facebook was an important part of their adjustment to college life from a social standpoint, they continued to value face-to-face interaction and did not view Facebook as important for formal teaching purposes.

Other studies have examined preferred methods of student–professor interaction. Michelson and Smith (2008, pp. 131–138) found that students in undergraduate finance courses favored, in order, face-to-face communication, e-mail, instant messaging, and telephone. Students viewed instant messaging as a supplement to, but not a substitute for, face-to-face interaction. On the other hand, Kuyath (2009, pp. 33–69) found somewhat different results for student–instructor communication in engineering technology distance education courses. These undergraduate students reported that instant messaging is higher in social presence and more effective for communication with the instructor than e-mail.

It would appear from the limited research that students do have different preferences depending upon whether their communications are social or business (Lancaster et al., 2007, pp. 5–22; Madge et al., 2009, pp. 141–155). Furthermore, some of this research (e.g., Michelson & Smith, 2008, pp. 131–138; Kuyath, 2009, pp. 33–69) deals with student–instructor interactions and does not address student–student interactions. We are not aware of a published study that has compared students' preferences between online and traditional sections of the same course in terms of their preferred communication methods for group work. Perhaps the relative convenience of face-to-face meetings in traditional courses and the relative convenience of online-facilitated meetings in online courses are related to how students communicate in completing group work. However, it is also possible based on current trends and the limited research noted above that students in either delivery method will prefer technology-assisted means of communicating with other students. In any case, the communication methods used are part of the ''inputs'' that go into the course (Crow, Cheek, & Hartman, 2003, p. 335) and may have an impact on ultimate student satisfaction.

The current study leaves open the methods of communication, regardless of course delivery method, and considers different choices of preferred communication methods. In doing so, we are able to examine whether students learning under the two different delivery methods lean toward different communication methods. Specifically, we examine the following final research question:

RQ3. Do students in online and traditional classes use different communication methods when performing group work?

DATA COLLECTION AND METHODS

Participants

Over a three-year period, students from six sections of the same intermediate-level cost accounting course participated in a survey aimed at assessing the effectiveness of online course delivery versus traditional classroom delivery across different group dimensions. The courses were taught at a public, AACSB-accredited university located in an urban setting that has a very high percentage of commuting students. Approximately 63 percent of undergraduate students are full time and approximately 38 percent of undergraduate students are of age 25 or older. Relatively large numbers of students

Table 1. Demographic Information.

	Traditional	Online
By Gender		
Male	32	31
Female	32	44
Total	64	75
Mean age	26.39	28.20
Mean self-reported undergraduate GPA	3.34	3.78

are employed while attending classes, with over 40 percent of freshmen and 50 percent of seniors working at least 20 h per week.

The university and its business school began offering online courses in 2000. At the time of the study in 2006–2009, approximately 25 percent of undergraduate business school courses were offered online.

The study included 64 students in three traditional classroom sections and 75 students in three online sections. The survey, which was reviewed and approved by the university human subjects committee, was completed anonymously and separately from the course evaluation.

Because certain demographic variables could account for differences observed, we collected information regarding gender, age, and under-graduate grade point average (GPA). Table 1 provides demographic information related to the student participants. They included 63 males and 76 females. The average age of student participants was 27 years (SD = 7.60) and the average self-reported undergraduate GPA reported was 3.57/4.00 (SD = 2.76). There were no significant differences between the two delivery methods or between sections of the same delivery method with respect to these demographic variables.

Course Administration

In order to avoid potential instructor-based biases, we designed the study so that all of the classes surveyed were taught by the same instructor, who had significant experience teaching in both delivery modes. The traditional and online sections differed only in the method of delivery. One section was offered per semester, either traditional or online, and the classes were taught over a period of three academic years. Because the classes were not taught in the same semester, we used a "semester" variable to examine whether there

were differences due to the different semester in which the course was offered. The results indicated that there were no significant differences in student responses related to the semester. Further, the teaching evaluations for both online and traditional courses were consistently above 4.0 (on a five-point scale) for all of the courses taught. These results suggest no "learning effect" or bias toward one teaching mode on the part of the instructor.

The instructor administered the online and traditional sections of the course using Blackboard® and assigned both individual and group cases as part of the fulfillment of course requirements under both delivery methods. There were two group assignments, including a research paper and a case assignment. Combined, the group assignments accounted for 25 percent of the final course grade. Individual assignments included two cases and 10 homework assignments, which together, accounted for 27.5 percent of the final course grade. The instructor assigned students alphabetically into groups of four (where possible) for group assignments, which consisted of a research paper and a case focusing on integrating key management accounting topics discussed in the course. Students were asked to post some background information (e.g., hobbies, employment affiliation, etc.) on the discussion board in order for their fellow group members to become better acquainted with them.

To help facilitate interactions and communications within the groups, the instructor utilized functions in Blackboard that allowed students to share information and exchange files with their teammates. Students also used e-mail in the Blackboard system to interact with their team members and the professor. In the first meeting and in the course syllabus, the instructor informed the students that they would fill out confidential peer evaluations near the end of the semester to assess the relative contribution of each group member and that these evaluations would affect grades. The instructor had knowledge of the identity of each student completing the peer evaluation, but other students did not. The instructor then adjusted individuals' grades based on these peer assessments.

Survey

We adapted many of the survey items from Chen and Jones (2007, pp. 25–38) and Jones and Chen (2008, pp. 15–28), while adding new items to provide a deeper examination of group dynamics. Students responded to each of these items on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). We examined all differences for significance using one-way ANOVAs.

The following sections discuss the comparative perceptions related to group processes, group learning outcomes, satisfaction with group work, and communications within the group in online and traditional sections of the same course.

COMPARATIVE SURVEY RESULTS

Group Processes

The survey included a number of items aimed specifically at examining whether students learning under the two different methods had different perceptions of group work. Table 2 provides mean responses relative to their overall satisfaction with group processes.

The results related to group processes, although mixed, generally favor the traditional classroom approach. Many of the differences shown are significant. Students in the traditional classes were significantly more likely to agree that conflict resolution in groups was smooth (item 1; $p < 0.01$). They were also more likely to perceive a natural leader emerging from the group (item 2; $p < 0.05$). Students in both groups agreed to some extent that the decision making was dominated by one or two members (item 3), and the difference between delivery methods was not significant ($p > 0.20$).

Table 2. Group Processes.

Item[a]	Traditional	Online	F-value	p-value
1. Conflict resolution in groups was smooth.	3.83	3.26	14.92	0.001
2. A natural leader emerged in the group.	3.98	3.61	5.14	0.025
3. The group decision-making process is usually dominated by one or two members.	3.81	3.63	1.14	0.288
4. The interaction among group members is effective in achieving group goals.	4.09	3.54	10.52	0.001
5. The group decision-making process is efficient.	4.10	3.52	14.14	0.000
6. The group decision-making process is effective.	4.09	3.50	15.07	0.000
7. I developed a social relationship with my group members.	3.57	2.30	47.93	0.000
8. The group size was appropriate.	4.21	4.16	0.29	0.587
9. The peer evaluation motivates me to work hard as a group member.	3.63	3.86	2.43	0.121

[a]Students answered on a five-point scale from 1 (strongly disagree) to 5 (strongly agree).

Therefore, this issue, which can impact the effectiveness of student learning in group activities, was present to a degree in both traditional and virtual environments. The interaction among group members appears to have been reasonably effective in both groups (item 4), but significantly more so in the traditional group ($p<0.01$). Importantly, the traditional group was also significantly more likely to agree that the decision-making processes were efficient (item 5; $p<0.001$) and effective (item 6; $p<0.001$). Perhaps not surprisingly, traditional classroom students also indicated more agreement that they developed social relationships with group members (item 7; $p<0.001$).

Students in both the traditional and online classes seem to feel that the group size (generally four students) is appropriate (item 8), and the difference between the delivery modes was not significant ($p>0.50$). Also important is the level of motivation provided by the peer evaluations (item 9). Both groups were somewhat likely to agree that the peer evaluation motivated them to contribute to the group's effort, and the difference between delivery modes was not significant ($p>0.10$).

Satisfaction With Group Outcomes

A number of survey items investigated students' perceptions of learning outcomes related to group work and several issues related to group dynamics that were believed potentially important to their satisfaction. Table 3 provides mean responses for these items.

As shown in Table 3, the results related to group outcomes consistently favor the traditional classroom approach. Traditional classroom students in general felt more strongly that the group case assignments were helpful in learning course content (items 10 and 11; $p<0.001$). Online students indicated more strongly that they prefer the individual case assignments over the group assignments (item 12; $p<0.001$). Likewise, traditional classroom students seem to find the group work more satisfying than do their online counterparts (item 13; $p<0.001$). Finally, the traditional classroom students felt more strongly that the benefits of group work exceeded the personal costs (item 14; $p<0.01$).

Some of the other items examine group dynamics in more detail and offer plausible explanations for some of the differences in satisfaction levels with group processes and group work. Traditional classroom students had more positive perceptions on several areas. They were relatively more likely to agree that group members contributed equally to assignments (item 15;

Table 3. Satisfaction With Group Outcomes.

Item[a]	Traditional	Online	*F*-value	*p*-value
10. The group case assignments were helpful in learning course content.	4.17	3.04	40.41	0.000
11. Group work enhanced my understanding of materials in this course.	3.80	2.79	32.41	0.000
12. I learned more from working on the individual case assignments than group case assignments.	3.62	4.30	15.82	0.000
13. I found the group work to be satisfying.	3.63	2.68	14.09	0.000
14. Overall, the benefits of group work exceed the personal costs (time, effort, etc.)	3.48	2.90	8.20	0.005
15. Group members contributed equally to assignments.	3.82	3.24	7.76	0.006
16. The group project's output is of good quality.	4.32	3.69	22.15	0.000

[a]Students answered on a five-point scale from 1 (strongly disagree) to 5 (strongly agree).

$p < 0.01$) and that their group project was of good quality (item 16; $p < 0.001$). Picciano (2002, p. 31) found that students' perceptions of social presence demonstrate a strong positive relationship with performance on written assignments. Perhaps the social presence felt by the in-class groups was stronger than in the online groups, resulting in higher accountability or more effort and leading to a better perceived final product relative to the groups associated with virtual courses.

Although not part of our research questions, we examined overall performance on group and individual assignments and compared online and traditional modes. The traditional sections outperformed the online sections ($p < 0.01$) on average overall course performance and on the individual assignments ($p < 0.01$). Conversely, the online sections did better on the group assignments than did traditional sections ($p < 0.01$). So somewhat paradoxically, relative performance on individual and group work in traditional versus online courses ran counter to relative satisfaction with individual and group work in traditional versus online courses.

We also found another differential result when we examined overall course satisfaction and satisfaction with group work (item 13). For the traditional classroom sections, there is a significant positive correlation between overall satisfaction with the course and satisfaction with the group experience (Pearson correlation $= 0.27$, $p = 0.02$). However, this relationship is not significant for the online sections ($p > 0.22$). We also examined the correlation between overall course performance (as measured by expected grade) and satisfaction with the group experience. However, we found no

Table 4.   Communication Within Groups.

Item[a]	Traditional	Online	*F*-value	*p*-value
17. I usually have face-to-face group meetings to discuss our group projects.	3.91	2.58	43.90	0.000
18. I usually use e-mail to communicate issues relating to group projects.	4.26	4.16	0.87	0.352
19. I usually use phone calls to discuss group projects.	2.75	2.32	6.23	0.014
20. Group work conducted over the internet is more efficient than group work conducted face-to-face.	2.92	2.46	5.61	0.019

[a]Students answered on a five-point scale from 1 (strongly disagree) to 5 (strongly agree).

correlation between this measure and satisfaction with group work for students in either delivery method.

Communication Within Groups

The study also addressed how students communicated and coordinated activities to carry out their group work. As shown in Table 4, traditional classroom students were more likely to have face-to-face group meetings than were online students (item 17; $p < 0.001$), which is not surprising given that online students likely chose that delivery method for the convenience of not attending classes on campus. However, the traditional group was at least as likely as their online counterparts to use e-mail to communicate group issues (item 18; $p > 0.35$). Neither group appears to use the telephone extensively, although the traditional group's mean was significantly higher on that item (item 19; $p < 0.05$). Neither group agreed that the Internet was more efficient for completing group work than meeting face-to-face. Interestingly, online students held this view to a significantly greater extent despite their presumed relative comfort with working over the Internet (item 20).

CONCLUSIONS AND IMPLICATIONS

The results of this study suggest that group work is perceived as more effective in traditional courses than in online courses. Many of the differences relating to group work were significant statistically and favored the traditional classroom learning approach. However, several mean responses in the 3.0–3.7 range for both traditional and online students

arguably indicate a lack of strong appreciation for the benefits of group work, because a response of "3" on a five-point scale indicates "neutral." In the final analysis, traditional classroom students provided a higher mean response when asked whether the benefits of group work exceeded the personal costs. However, the lack of strong responses by either the traditional or online group possibly renders some of the significant differences not "practically significant."

The lukewarm reception that group work often elicits is possibly due to a number of reasons. Two commonly cited issues are free-riding and the logistical difficulties involved in getting two or more people together at mutually satisfactory times (Erez & Somech, 1996, pp. 1513–1537; Harkins, 1987, pp. 1–18). With regard to balanced input from group members, both traditional and online students expressed the view that a small number of group members tended to dominate decision making to some degree. The difference between traditional and online students in this regard was not statistically significant.

Some course design issues are worth noting from the current results. Regardless of students' feelings about group work, it is still important because the ability to work in teams is highly valued by many employers (Chen et al., 2004, p. 25; Lewis et al., 2005, p. 3). On positive note, students felt fairly strongly that the group size (generally four) was appropriate. The results suggest that peer evaluations motivated students to some degree to work diligently in groups and reduced free-riding, and the responses did not differ significantly between traditional and online students. Brandyberry and Bakke (2006, p. 207) suggest that the use of an online peer review system and an online interactive activity log can mitigate the common negative behaviors of social loafing and free-riding. Further, this online peer review system can provide more accurate and useful information for evaluation of performance in group work. Such online systems might be useful additions to traditional classroom sections as well.

Overall, the comparative results are significantly less favorable for online students than for traditional classroom students from the same course. Traditional classroom students were significantly more likely to indicate that group case assignments were helpful in learning course content and enhancing their understanding of materials in the course. Conversely, online students indicated significantly more strongly that they learned more from individual case assignments than from group case assignments. These results are interestingly different from those of Jones and Chen (2008, p. 21), who found that blended-learning students actually had better perceptions of group work in many respects than did traditional classroom students in an

MBA-level accounting course. For instance, blended-learning students in that study were significantly more likely than their traditional-class counterparts to believe that the group's decision-making process was efficient and resulted in a good-quality output, and that the group interactions were effective in achieving group goals. While blended learning is not strictly online, there were only a few on-campus meetings in such classes at the university involved in this study. Therefore, it remains primarily online and can be thought of as a form of distance learning in comparison with traditional classroom delivery.

While some may view traditional versus online courses as an either-or decision, this is not actually the case. In fact, there is frequently little to prevent an instructor in a traditional in-class course from incorporating many, or possibly even all, online teaching and learning methods and techniques.

Conversely, it is probably more difficult for an instructor to incorporate some typical in-class teaching and learning approaches into an online course, e.g., face-to-face lectures and discussions, in order to close gaps in effectiveness. Some possibilities include podcasting, video lectures, and discussion boards. In both online and traditional courses, it seems that benefits will accrue when instructors work to identify learning objectives and the best ways to achieve them. As blended-learning courses seem to suggest, improved learning can result by considering a wide spectrum of teaching methods, rather than just those at extreme ends of the spectrum.

One important set of survey results relates to how students carry out their group discussions and issue resolution. Traditional classroom students were considerably more likely to believe that their decision-making processes were both efficient and effective, and that the process resulted in a good-quality output. Interestingly, both traditional classroom and online students indicated fairly strongly that they tend to use e-mail to communicate group issues, and they did not differ significantly. However, neither group believed that group work conducted over the Internet was more efficient than meeting face-to-face. The latter result appears consistent with the finding by Straus and McGrath (1994, pp. 87–97) that group members operating online may take longer to reach consensus and make decisions.

As would be expected, traditional classroom students were considerably more likely to have face-to-face group meetings. It may be that the greater use of face-to-face meetings helps to facilitate the process and results in better satisfaction in the final analysis. Perhaps the use of a blended-learning approach, which offers several face-to-face meetings, can result in a better collaborative learning experience for online groups as a result of more interactions among group members (Jones & Chen, 2008, p. 21). Does the

blended-learning approach offer "just enough" face-to-face interaction to mitigate some frustrations that online students experience with group work? This question is intriguing and, although the current study does not answer it definitively, the fact that the results run somewhat counter to those of Jones and Chen (2008, pp. 21–22) is consistent with such a suggestion.

It is interesting that students gravitate toward e-mail communications and away from using the telephone, although both traditional and online students seem to find group work conducted over the Internet to be less effective than face-to-face communications. In the authors' considerable experience, telephone conversations are arguably the "next best thing" to meeting face-to-face with another party and are often more efficient than e-mail communication. The relative aversion to communication via the telephone is likely because group communications involve more than two people.

The results of this study suggest that instructors who employ group assignments should take steps to ensure that the benefits of group assignments are not diminished by other aspects of group work. This is particularly true when group assignments are employed in online courses. Prior research suggests that group assignments can facilitate increased learning motivation, development of critical thinking and problem-solving skills, and opportunities to construct new knowledge through sharing ideas (Dewiyanti et al., 2007, pp. 511–512; McFadzean & McKenzie, 2001, p. 484). However, these opportunities can be negated if students perceive working in groups to be inefficient, inequitable, ineffective as to learning, or otherwise frustrating. Findings in this study indicate that this can occur, particularly in online courses.

Instructors should consider designing and planning group work in online courses to minimize unnecessary inefficiencies in completing group assignments and inequities in student workloads and grading to ensure effective student learning. This may include supplemental instruction in working effectively in group environments. In addition, perhaps instructors in both traditional and online courses should reiterate the importance of teamwork skills to employers and to the advancement of students' careers as a result. This emphasis may help students understand the reasons for using group projects in academic programs.

Limitations and Future Research Opportunities

The study's findings regarding communication within groups are limited, in part because only four survey questions addressed this area. In addition, the

responses to these questions are surprising to a degree because they suggest that online students seem less interested than expected in using computer-assisted or enhanced communication methods such as e-mail. Typically, it might be relatively easy for traditional classroom students to meet briefly before or after a traditional class. Conversely, such naturally convenient times are less available for online classes. Therefore, we would have expected online students to be more inclined toward computer-assisted communication. Future research regarding differences in group communication between online and traditional students could provide valuable insights. In addition, future researchers should consider including text messaging and instant messaging as options, due to the widespread use of such communication methods.

The findings regarding peer evaluation incentives are limited, with responses to one survey question suggesting that students were moderately motivated by this mechanism. Further research with additional direct questions could add additional insights into the motivational effectiveness of different peer evaluation approaches.

The results are consistent with some prior research (e.g., Michelson & Smith, 2008, pp. 131–138) suggesting that the current generation of college students does not tend to use the telephone as much as other communication media, at least when communicating about school work. These results seem surprising when one considers the time that the current generation of students appears to spend on their cellular telephones; however, the results might be explained by the number of people (greater than two) involved in the simultaneous communication in group work. Future studies should further examine whether there are truly generational differences with regard to a preference for using the telephone, their views about the efficiency of different communication methods, and whether those views truly differ depending upon whether they are communicating with instructors or fellow students. Finally, we do not capture the nature of communications that take place in e-mail, face-to-face, and in other methods of communication. The number and nature of each type of communication between group members could yield further insights into their preferences. For example, students in traditional classroom sections may prefer a face-to-face meeting only for the purpose of getting acquainted before moving to a primary reliance on e-mail.

Future research at other institutions using different instructors is warranted, as are studies in different levels of courses. This study benefited from having one instructor teach all online and traditional sections in a similar manner. Consequently, differences in factors such as institutional environments, grading standards, and instructor teaching style are

minimized. While this level of internal validity may not be possible in other settings, studies of group dynamics that use different group assignments, are in different levels and types of courses, and administer group assignments in different ways can extend and test the external validity of this study.

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ASSESSING SERVICE-LEARNING OUTCOMES FOR STUDENTS PARTICIPATING IN VITA PROGRAMS

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ABSTRACT

This study evaluates participation in the Volunteer Income Tax Assistance (VITA) program, a service-learning activity, to determine if participating students develop confidence in the skills needed for success in the accounting profession. An analysis of data from students at eight U.S. universities shows that VITA students were significantly more confident in their practical skills, citizenship skills, and personal responsibility skills after their VITA experience than a control group of students who did not participate in VITA, measured over a similar period of time. The VITA participants also reported a stronger sense of school pride and moderately more confidence in their interpersonal skills. However, the VITA students reported less confidence in their problem-solving skills, perhaps due to being faced with complex decision-making situations. While this finding was initially unexpected, it actually demonstrates the value of experiential learning for students.

> Service-learning incorporates community work into the curriculum, giving students real-world learning experiences that enhance their academic learning while providing a tangible benefit for the community. (Campus Compact, 2009)

The purpose of this study is to investigate the effects of participating in a Volunteer Income Tax Assistance (VITA) program on student outcomes related to professional competencies. The Accounting Education Change Commission (AECC, 1990) determined that accounting graduates should possess communication, intellectual, and interpersonal skills. The *AICPA Core Competency Framework for Entry into the Accounting Profession* (AICPA, 1999) provides guidance to educators on the skills needed for successful accounting careers both now and in the future (Thomas, 2000). The framework delineates the three categories of core competencies as functional, personal, and broad business perspective competencies. Functional competencies relate to accountants' technical skills, such as decision modeling, measurement, and research skills. Personal competencies relate to individual attributes and values, such as problem solving, interaction, and communication. Broad business perspective competencies relate to how accountants understand internal and external business environments (AICPA, 1999). Albrecht and Sack (2000), in their critical examination of the future of accounting education, strongly recommend that students participate in out-of-classroom activities, such as internships, field studies, and service-learning assignments. Properly structured service-learning activities help accounting students develop the skill sets they need to succeed in the profession. They give students the opportunity to be actively involved with their education, and they allow students to learn by hands-on, out-of-classroom experiences.

Numerous U.S. universities involve their students in VITA programs. These programs are service-learning activities in which students, primarily in the field of accounting, assist low-income members of the community to complete their annual federal and state tax returns. In many cases, these students receive college credit for a course that includes VITA participation. Students who participate in VITA programs learn the technical skills that are needed to assist clients. Students are required to interact professionally with a wide range of people, communicate effectively about tax issues, solve problems, and manage the return completion process. A VITA program can be service learning in that it combines course learning with an applied service activity. Hence, VITA programs are well suited to enhancing students' technical and personal competencies.

There are few studies about service learning in accounting education and even fewer empirical analyses of service learning and student outcomes in

the accounting field (Rama, Ravenscroft, Wolcott, & Zlotkowski, 2000; Andrews, 2007). We report the results of a service-learning experience using a cross-sectional sample of students working in VITA programs at eight U.S. universities during spring 2008. This research provides evidence of changes in student perceptions and skills related to the VITA experience. The findings of this study are strengthened by the underlying characteristics of the analysis: pretest and posttest measures, a control group of non-VITA students, the use of validated psychometric scales, and a cross-section of participants from eight VITA programs.

Empirical research evaluating the impact of service learning through VITA participation is important. Accounting programs are challenged to provide meaningful professional interactions for their accounting students to help them develop professional competencies (AECC, 1990; AICPA, 1999; Albrecht & Sack, 2000). However, deans and department heads are challenged by a scarcity of accounting faculty resources (Leslie, 2008). Service-learning courses are often time intensive for faculty and require a commitment beyond the traditional classroom boundaries. Given the results of this study, educators may better understand the multifaceted value of service learning, have a potential model to evaluate their own service-learning courses, and be more willing to support service learning in their curriculum.

The remainder of this chapter is organized as follows. In the next two sections we review relevant literature and develop our hypotheses. We then report our methods and results, followed by a discussion of our findings, the limitations of the current study, suggestions for future research, and the conclusion.

LITERATURE REVIEW

During the past decade, a body of research has been published reporting the effects of service learning on students, faculty, schools, and communities (Eyler, Giles, Stenson, & Gray, 2001). A number of large-scale studies have specifically examined the impact of service participation experiences on college and university students' attitudes, perceptions, and outcomes. Astin and Sax (1998), in a longitudinal study of service participation outcomes involving 3,450 students attending 42 academic institutions, report that participating in service programs favorably affected students' academic outcomes, civic responsibility, interpersonal skills, and social self-confidence. Eyler and Giles (1999) report positive impacts on students' personal

development, social responsibility, interpersonal skills, and learning out-
comes in their study of 1,110 students involved in service-learning projects
at 20 U.S. colleges and universities. Gray et al. (1998) evaluated 725 service-
learning students at multiple institutions participating in the Learn and
Serve America program and reported that service-learning experiences
positively affected student development, grade point averages, and learning
satisfaction.

The large-scale studies discussed above primarily involve service-learning
programs in the arts and sciences. Different effects of service learning in
business disciplines are possible. Therefore, it is important to explore service
learning within a business discipline like accounting. In particular, this
study focuses on the VITA service-learning experience to determine if it is a
useful means of developing the professional competencies desired by the
AICPA (1999).

Accounting Discipline Service-Learning Studies

Accounting academicians have posited that service learning provides an
effective means for students to develop many of the AICPA's core
competencies (Rama et al., 2000; Sharifi, McCombs, Fraser, & McCabe,
2009; Still & Clayton, 2004; Tschopp, 2004). A 16-essay monograph edited
by Rama (1998) develops a theoretical framework for service learning in
accounting and describes potential implementation across the accounting
curriculum. McCoskey and Warren (2003) discuss the process, benefits,
and practical issues of using service-learning projects in the accounting
curriculum.

The benefits and implementation issues of service-learning projects in
specific accounting courses are described for accounting communication
(Sharifi et al., 2009), auditing (Still & Clayton, 2004), governmental/
nonprofit (Still & Clayton, 2004), information systems (Hoxmeier & Lenk,
2003; Khan & Haroon, 2002; Rose, Rose, & Norman, 2005), intermediate
accounting (Gujarathi & McQuade, 2002a, 2002b), and management
accounting (Chiang, 2008). With the exception of Still and Clayton (2004)
and Rose et al. (2005), none of these accounting studies provide empirical
analyses of students' service-learning outcomes. Rama et al. (2000) and
Andrews (2007) note the scarcity of empirical service-learning studies
focused on the accounting curriculum. Thus, there is a need for additional
empirical research on service-learning benefits in the accounting discipline.

There have been a number of papers published that discuss VITA in a service-learning context; however, the vast majority of these papers are descriptive in nature. These papers generally describe the VITA programs and potential service-learning benefits and provide insights on how to structure and implement VITA service-learning courses or programs successfully. Such studies include Campbell, Reider, and Maloney (2002), Clovey and Olapido (2008), Long and Kocakulah (2007a, 2007b), and Price and Smith (2008). In addition to these descriptive studies, two studies include some quantitative evaluation of student outcomes related to VITA.

Quinn, Garner, Marshall, and Smith (1995) administered a 15-item questionnaire to 83 graduates who participated in their school's VITA program. The respondents reported relatively high scores for the knowledge and skill acquisition questions, and perceived improvements in their self-confidence, social awareness, and understanding of ethical standards. Anderson and Bauman (2004) evaluated the perceptions of graduate tax students who participated in a low-income taxpayer clinic (LITC). Like VITA, LITC students interact with taxpayers and perform tax research; however, LITC participants deal primarily in tax controversies and represent taxpayers before the IRS. The results of an eight-item scale administered to 29 graduate tax students showed that students generally believed that the LITC experience enhanced their tax research skills, improved their communication skills, and strengthened their understanding of societal and regulatory matters. While these studies used questionnaires to measure student perceptions quantitatively, they both focused on posttest measures from VITA students only; no pretest measures, control group measures, or validated scales were utilized in these studies.

HYPOTHESES

The goal of this research project is to examine empirically the effect of VITA in a service-learning context on student outcomes. Using student data from multiple VITA programs, we evaluate if VITA participation has positive effects on the development of students' confidence in their technical and personal skills. These skills align with the functional and personal competencies of the AICPA Core Competency Framework (AICPA, 1999). To evaluate the effect of VITA participation in a service-learning context, we propose and test six hypotheses, described below.

Practical Skills

Literature on the impact of service learning on students' practical skills is mixed. A number of studies show positive impacts of service learning on academic outcomes (Gray et al., 1998; Markus, Howard, & King, 1993; Vogelsegang & Astin, 2000). In contrast, Eyler, Giles, and Braxton (1997) studied 1,140 service-learning students and reported no impact on students' issue identification, communication, or critical-thinking skills, compared to a control group of 400 students.

VITA participation gives students opportunities to improve their technical competencies related to tax knowledge and materials. VITA students are asked questions about a wide range of problems and must learn how to identify the relevant issues, research the authoritative sources, and find information efficiently. Students learn what forms to use and what information is needed on each form. Clients often come to VITA sessions with unorganized information, and the students learn how to sift through the information and to ask questions of the clients to elicit needed information. They must document outcomes for the clients. VITA students are exposed to the real-world complexities faced by their clients. Having a greater understanding of the different situations tax preparers are faced with is on-the-job training that cannot be taught in a classroom setting.

> **H1.** Students who participate in a VITA service-learning program will be more confident in their practical skills than students who have not participated in a VITA program.

Interpersonal Skills

Eyler and Giles (1999) report that service learning significantly affected students' personal and interpersonal development. Students reported that their service-learning experiences gave them chances to work with people from ethnic, educational, and social backgrounds different from their own. The service-learning experience moved students out of hierarchical classroom settings with focused assignments into complex settings where they are doing real and meaningful work for the community. This field-based learning requires students to communicate and work with others to accomplish goals. In a classroom setting, students are in a subordinate relationship with the instructor, but in the service-learning experience

students assume more adult responsibilities that affect their interpersonal development.

Through VITA programs, students meet with dozens of community members who are different from themselves or their classmates. Some VITA clients are from other countries and cultures, many do not have college educations, and all of them are there because they need help with their tax filings. The first task for students is to gain rapport with their clients and to establish a working relationship. This may be accomplished through a handshake, a welcoming greeting, eye contact, or other interpersonal means of communication. The students must learn how to talk to people about personal financial information, such as income and potential deductions and credits. They must learn how to present their analyses in a professional manner and to communicate technical financial data in a way that the clients can understand. The students sometimes must communicate bad news to the clients: for example, that the clients must pay additional taxes or that their tax refunds are not as large as expected. The experience of working with a diverse set of clients requires the students to develop their interpersonal skills.

H2. Students who participate in a VITA service-learning program will be more confident in their interpersonal skills than students who have not participated in a VITA program.

Citizenship

Battistoni (2002, p. 12) describes citizenship to include "professional work with a civic purpose" (civic professionalism) and "responsibility to a larger society" (social responsibility). A number of studies in other disciplines document that service-learning participation positively impacts students' social responsibility and citizenship skills (Eyler & Giles, 1999; Markus et al., 1993; Rockquemore & Schaffer, 2000). Myers-Lipton (1998) compared civic responsibility outcomes for three groups of students – one group performing community service as part of a course (service learning), one group performing community service but not linked to course work, and a third group not performing community service. The service-learning group showed significantly higher gains in civic responsibility scores over the course of the study, whereas the other two groups did not demonstrate gains. Astin and Sax (1998) found that students participating in service

projects had a stronger commitment to helping others who are in difficulty and in promoting racial understanding than those who did not participate.

Students participating in VITA receive specialized training in tax knowledge, which is then applied according to the standards and norms of the tax code and the profession. This is ''professional work with a civic purpose'' (Battistoni, 2002, p. 12). We expect that VITA participation favorably affects students' citizenship skills because the VITA work requires the students to use their professional skills and knowledge to complete the tax returns. The work lets students directly see the results of helping others in the community and helps them become more connected to members of the community. The clients represent a range of socioeconomic and cultural backgrounds, enabling the students to understand better the diversity that exists in the community.

H3. Students who participate in a VITA service-learning program will be more confident in their citizenship skills than students who have not participated in a VITA program.

Personal Responsibility

Personal responsibilities include social self-confidence, the ability to assume responsibility for outcomes, and being trusted by others (Toncar, Reid, Burns, Anderson, & Nguyen, 2006). Astin and Sax (1998) report that service participation has a positive impact on students' abilities to work cooperatively, to get along with other people of different races and cultures, and to resolve conflict. VITA participation enables students to gain social self-confidence and ethical awareness through working closely with professors managing the program and working with a diverse set of clients. Learning takes place when students can monitor their own learning, by experiencing the complexities of client interaction and tax return preparation. Students in a service-learning experience receive real-time feedback about their performance, for example, by asking clients questions that elicit needed information, by completing forms correctly, and by explaining outcomes to clients in ways that clients understand and accept.

We expect that VITA participation favorably affects students' personal responsibility skills because it reinforces both the personal responsibility of clients and students. From the client side, it is the clients' responsibility to provide the needed information to complete the tax returns. The students cannot complete the returns without the clients complying with a number of

information requirements. Therefore, students are put in the role of requiring personal responsibility from their clients. VITA students also have a heightened sense of personal responsibility in that the tax returns represent legal documents for the clients. The tax returns also have very real financial consequences for the clients. These factors serve to sharpen the students' attention to completing the tax returns accurately. They need to ask questions of the faculty mentors and other VITA volunteers when they are faced with a problem that they cannot solve, because the consequences of not doing so can negatively affect the client.

    H4. Students who participate in a VITA service-learning program will be more confident in their personal responsibility skills than students who have not participated in a VITA program.

Problem Solving

Astin and Sax (1998) report a significant effect of service participation in human needs service projects with students' changes in critical-thinking abilities. In a study of students at two Virginia universities, about 75% of the students reported that their service-learning experiences helped them to link course material to real-world problems and to better solve problems due to the broad range of experiences in their service-learning assignments (Virginia Commonwealth University, 1997). Eyler, Root, and Giles (1998) compared problem-solving abilities between two collegiate student groups: community service "experts" (students with extensive community service experience) and "novices" (students with beginning or no service experience). They found that the community service "expert" group demonstrated stronger problem-solving skill sets. Also, Eyler and Giles (1999) report that students in service-learning classes with strong integration between academic learning and the service experience improved their problem-solving skills to a greater degree than students in courses with weak service-learning integration or with no service-learning component.

    We expect participation in VITA programs to improve students' confidence in their problem-solving skills because completing tax returns require students to solve a series of steps, or problems. Although each tax return has a standardized structure of information required, not all clients come to the VITA workshops with the required set of information, or the information is not readily obvious. The first problem that students must solve is one of gaining rapport with the clients in order to elicit needed

information. Working with the clients, the students must solve problems of incomplete or missing information. They must also solve some more complex tax problems as they determine which schedules need to be completed and what credits or deductions the VITA clients may be eligible to claim. They not only learn what questions to ask of the clients to gain needed information but also what questions to ask of the faculty mentors when they are uncertain about how to solve a particular problem. These experiences will give the students confidence in their problem-solving abilities.

> **H5.** Students who participate in a VITA service-learning program will be more confident in their problem-solving skills than students who have not participated in a VITA program.

School Pride

A number of research studies have reported a significant impact of service learning and student satisfaction with college (Astin & Sax, 1998; Gray et al., 1998). This satisfaction stems partly from the increased interaction with the service-learning faculty members, and also from the increased learning that takes place in the service-learning experience. Astin, Sax, and Avalos (1999) further report that participation in college service programs was significantly associated with students donating money to the college in the four years postcollege.

Research has shown that when individuals are proud of an organization they are likely to be loyal to the organization and work harder (Grant, 2008; Svensson, Müssener, & Alexanderson, 2006). Pride and satisfaction are determined by a company's performance management and professional development practices, the quality of supervision it provides employees, and the extent it behaves in a socially responsible manner (Grant, 2008). Svensson et al. (2006) suggest that pride is closely linked to self-esteem and self-identity and that when individuals are proud of an organization with which they associate they perceive themselves in a positive light.

The VITA programs in this study were associated with universities, and most took place in university classrooms or computer labs. VITA clients receiving help therefore associated the service they received with the university. The VITA service is free to community members, resulting in clients who are generally very appreciative of the help they receive. Many of the clients receive tax refunds, which increases their appreciation of the

VITA service. As representatives of the university who are working directly with clients, the VITA students are direct recipients of this client goodwill. This interaction could lead to increased school pride for the students. Also, the students, through being able to help clients with the skills they have gained in their coursework, may translate those abilities into increased pride for their educational experience.

> **H6.** Students who participate in a VITA service-learning program will have a stronger sense of school pride than students who have not participated in a VITA program.

METHODS

This study uses student data from eight geographically dispersed U.S. universities: five public and three private institutions. We contacted academic colleagues at various schools to request their students' participation in the study. Participating colleagues received a structured e-mail that they forwarded directly to their students. The e-mail briefly described the study to the students and included a link to the online survey instrument. Each colleague was asked to send the e-mail to the students participating in the school's VITA program (VITA students) and to a separate set of accounting students who were not participating in the VITA program (control group). We did not collect data on the total number of students who received the e-mail, as the e-mails were sent by the accounting colleagues and the number of students who read the e-mails was not ascertainable.

We collected a set of pretest data prior to the start of the 2008 VITA program from VITA students and a control group of non-VITA students and a similar set of posttest data at the conclusion of the VITA program. Use of a control group distinguishes this study from prior VITA service-learning studies and increases its internal validity (Rama et al., 2000). The academic colleagues did not have access to the raw data. As an incentive for participating, we offered to summarize their students' outcomes compared to the outcomes of all participating students.

Pretest Procedures and Analyses

The pretest instrument was developed based on three validated scales used in prior research studies. Toncar et al. (2006) developed a 12-item Service

Learning Benefit (SELEB) scale with four dimensions that encompass several of the AICPA's core competencies: practical skills, interpersonal skills, citizenship, and personal responsibility. The problem-solving scale consists of six items drawn from the confidence factor of the Problem-Solving Inventory (PSI) instrument developed by Heppner and Petersen (1982). The school pride scale consists of four items from the identification and involvement subscales of the British Organizational Commitment Scale (Cook & Wall, 1980). The appendix details the scales used in this study.

The online survey instrument first asked students to supply demographic and educational background information (gender, age, undergraduate GPA, year in school, undergraduate major, membership in Beta Alpha Psi (BAP) or an Accounting Club, and participation in other service-learning courses or activities). Next, the students were asked to indicate the importance of the 12 SELEB items to their educational experience using a seven-point Likert scale (1 = "not at all important"; 7 = "very important"). The students then responded to the problem-solving and school pride scales using a seven-point Likert scale (1 = "strongly disagree"; 7 = "strongly agree"). To avoid an order effect, the items for each of the three scales were sorted randomly before being displayed on screen.

We collected pretest data using an online survey instrument from January 24, 2008 to February 7, 2008, which was prior to the start of the VITA program at each school. Of the 250 students who responded to the survey, 55% were VITA students and 45% were control group students. Table 1 reports demographic and background data for the pretest groups.

We were unable to randomize the assignment between the control and the VITA group due to the nature of the study; however, we evaluated potential differences between the control group and the VITA students, using two-tailed tests. The demographic results indicate that the two groups were very similar. There were no significant differences between the groups on gender, age, undergraduate GPA, major, or other service-learning activities. However, the VITA students had a relatively higher percentage of seniors and graduate students and fewer juniors than the control group. Also, the percentage of students in the VITA group who participated in BAP or an Accounting Club was higher.

We evaluated the internal consistency reliability of each service-learning construct using Cronbach's α. As shown in Table 2, the Cronbach's α for each scale except practical skills exceeded 0.70, indicating acceptable reliability for exploratory research (Nunnally & Bernstein, 1994). Using a two-tailed multivariate analysis of variance (MANOVA), we found no statistically significant between-group differences on any of the six

Table 1. Demographic Data and Tests of Differences for VITA and Control Groups (Pretest, $n = 250$; Posttest, $n = 219$).

Variable	Pretest			Posttest		
	VITA	Control	Significance	VITA	Control	Significance
Number of students	138	112		137	82	
	55%	45%		63%	37%	
Gender						
Male	40.6%	43.8%		43.1%	35.4%	
Female	59.4%	56.2%	0.614	56.9%	64.6%	0.261
Mean age	23.2	23.9	0.264	23.1	23.5	0.480
Mean GPA	3.38	3.36	0.710	3.34	3.37	0.679
Year in school						
Sophomore	0.7%	2.7%		1.5%	1.2%	
Junior	16.7%	45.9%	0.000	18.2%	50.0%	0.000
Senior	48.6%	36.1%		48.2%	34.1%	
Graduate	34.0%	15.3%		32.1%	14.7%	
Major						
ACCT	92.0%	92.9%		94.1%	87.7%	
Other	8.0%	7.1%	0.806	5.9%	12.3%	0.095
Accounting club						
Yes	56.5%	33.0%		51.1%	37.8%	
No	43.5%	67.0%	0.000	48.9%	62.2%	0.056
Other service learning						
Yes	8.7%	9.8%		14.6%	3.7%	
No	91.3%	90.2%	0.759	85.4%	96.3%	0.011

constructs. Both groups of students indicated they believed that developing practical skills, interpersonal skills, citizenship, and personal responsibility skills is an important part of their education. Both groups had similar confidence in their problem-solving skills and exhibited comparable levels of school pride. These results suggest that the VITA students and control group students had very similar attitudes toward each of the six service-learning constructs prior to the beginning of the VITA sessions.

Posttest Procedures and Analyses

The posttest instrument was based on the same scales used in the pretest, with one important change. Consistent with the administration of the

Table 2. Pretest Reliability of Constructs and MANOVA Evaluation of
Mean Differences Between VITA and Control Groups ($n = 250$).

Construct	Cronbach's α	VITA		Control		
		Mean	Standard Deviation	Mean	Standard Deviation	Significance
Practical skills[a]	0.64	6.20	0.72	6.29	0.72	0.346[b]
Interpersonal skills[a]	0.77	6.08	0.80	6.11	0.87	0.827
Citizenship[a]	0.78	5.30	1.08	5.33	1.23	0.817
Personal responsibility[a]	0.73	5.98	0.75	6.02	1.00	0.736
Problem solving[c]	0.91	5.73	0.78	5.81	0.79	0.442
School pride[c]	0.87	5.50	1.14	5.32	1.17	0.220

[a]Students indicated how important each of the scale items was to them in their educational experience (1 = "not at all important"; 7 = "very important").
[b]Two-tailed tests of significance.
[c]1 = strongly disagree; 7 = strongly agree.

SELEB scale described in Toncar et al. (2006), the question preceding the SELEB items was changed to the following: "Over the past three months, I believe my skills or abilities in the areas below have …," with a seven-point Likert response scale where 1 = "substantially decreased" and 7 = "substantially increased." In the pretest, we asked students about the *importance to their educational experience* of various skills and abilities. This allowed us to determine if there were any pretest attitudinal differences between the VITA group and the control group. In the posttest, we asked both groups of students to indicate whether they believed that their *skills and abilities increased or decreased* over what was essentially the tax season.

The first four hypotheses were tested using the SELEB dimensions of practical skills, interpersonal skills, citizenship, and personal responsibility. H5 was tested using responses to the problem-solving scale, and H6 was tested using responses from the school pride scale. The posttest instrument also asked the VITA students to respond to a set of statements related to their satisfaction with the VITA program and an open-ended question about the most important thing they learned from their VITA experience.

We again used an online survey instrument to collect posttest data from April 10, 2008 to May 14, 2008 (near or shortly following the end of tax season), sending the posttest e-mail and survey link to the same academic colleagues who participated in the pretest. Of the 219 students providing usable responses to the posttest survey, 63% were VITA students and 37%

were control group students. Table 1 displays the posttest demographic and background data.

The results in Table 1 indicate that the two groups of posttest students were very similar. There were no significant differences between the groups on gender, age, undergraduate GPA, or major. Consistent with the pretest data, the groups differed significantly in year in school and slightly in BAP/Club membership. Among the posttest students, the participating rate in service learning activities other than VITA was significantly higher for the VITA students.

The internal consistency reliability of each posttest construct was evaluated using Cronbach's α. To control for the significant demographic differences between the posttest groups, we analyzed the data using multivariate analysis of covariance (MANCOVA) with year in school, BAP/Club membership, and other service-learning experience as covariates.

RESULTS

For the practical skills, interpersonal skills, citizenship, personal responsibility, and school pride results, VITA students reported higher means on each of these constructs than did the control group of students (Table 3). The outcomes for the practical skills, citizenship, and personal responsibility

Table 3. Posttest Reliability of Constructs and MANCOVA[a] Evaluation of Differences Between VITA and Control Groups ($n = 219$).

Construct	Cronbach's α	VITA		Control		
		Mean	Standard Deviation	Mean	Standard Deviation	Significance
Practical skills[b]	0.78	5.30	0.82	5.01	0.90	0.005[c]
Interpersonal skills[b]	0.81	5.14	0.79	4.99	0.86	0.075
Citizenship[b]	0.77	5.13	0.81	4.56	0.76	0.000
Personal responsibility[b]	0.71	5.02	0.85	4.80	0.79	0.036
Problem solving[d]	0.91	5.64	0.75	5.84	0.84	0.046
School pride[d]	0.90	5.58	1.05	5.19	1.21	0.063

[a]Year in school, BAP/Club membership, and participation in other service-learning activities are covariates.
[b]Students indicated their belief that, over the past three months, their skills or abilities in each scale item changed (1 = "substantially decreased"; 7 = "substantially increased").
[c]Two-tailed tests of significance.
[d]1 = strongly disagree; 7 = strongly agree.

constructs were highly significant and in the hypothesized direction; the results for the interpersonal skills and school pride constructs were modestly significant and in the hypothesized direction. Although there was a significant difference in the problem-solving results, the difference was in the opposite direction of our hypothesis, with the control group reporting a higher degree of problem solving confidence than the VITA students. We conducted additional tests to determine if VITA students who participated in other service-learning activities or participated in VITA in a prior year differed from students who participated in VITA for the first time in 2008 with respect to our dependent variables. No significant differences were found. We also tested whether responses to our dependent variables differed across participating schools, and no significant differences were observed.

The results presented above were for 219 students who responded to the posttest survey. By matching pretest and posttest responses by school and by the last four digits of students' phone numbers, which they provided, we were able to analyze the responses received from the 144 students who participated in both the pretest and posttest surveys where we could match results. We first tested for significant differences between these 144 students and the students who only participated in the pretest or in the posttest. No significant differences were found. The results of the MANCOVA analysis were substantially similar to the analysis of all the students who completed the posttest survey (Table 4). VITA students exhibited higher scores on each of the six scales except problem solving. Between-group differences were significant ($p < 0.05$) for practical skills and citizenship and marginally significant ($p < 0.10$) for personal responsibility, problem solving, and school pride.

DISCUSSION

We found substantial support for our hypotheses that VITA students would be more confident than the non-VITA students in their practical skills (H1), citizenship skills (H3), and personal responsibility skills (H4). In addition, we found moderate support that VITA students would be more confident in their interpersonal skills (H2) and would have a stronger sense of school pride (H6). The VITA program requires students to use their practical, interpersonal, citizenship, and personal responsibility skills for every client they serve, and the students receive immediate feedback about whether or not they are working effectively. If students do not ask the right questions of clients, needed information may not be communicated. As students

Table 4. MANCOVA[a] Evaluation of Differences Between VITA and Control Groups, Matched Sample of Students Completing Both Pretest and Posttest ($n = 144$).

Construct	VITA		Control		
	Mean	Standard Deviation	Mean	Standard Deviation	Significance
Practical skills[b]	5.24	0.79	4.88	0.82	0.017[c]
Interpersonal skills[b]	5.08	0.74	4.92	0.82	0.132
Citizenship[b]	5.05	0.77	4.43	0.66	0.000
Personal responsibility[b]	4.97	0.79	4.75	0.74	0.089
Problem solving[d]	5.67	0.80	5.91	0.76	0.062
School pride[d]	5.55	1.02	5.00	1.23	0.072

[a]Year in school, BAP/Club membership, and participation in other service-learning activities are covariates.
[b]Students indicated their belief that, over the past three months, their skills or abilities in each scale item changed (1 = "substantially decreased"; 7 = "substantially increased").
[c]Two-tailed tests of significance.
[d]1 = strongly disagree; 7 = strongly agree.

complete tax returns, the returns are generally checked by a faculty member or other experienced reviewer to verify completeness and accuracy. The students work face-to-face with their clients, and there is often a line of clients waiting for tax assistance. As returns are completed, the students communicate the outcomes directly to their clients, who are generally appreciative of the help they receive. Many clients do not realize that they are eligible for certain tax credits or deductions and are thankful that they will be receiving refunds instead of paying additional taxes. Some clients are not very fluent in English and need the VITA students to help them understand the tax documents and system, and they appreciate that help. Direct involvement with people needing tax assistance and applying their technical knowledge in a professional setting enables VITA students to learn and grow in ways that a sterile classroom setting does not support.

VITA students also provided qualitative evidence that they benefited from their VITA service-learning experience. The final question on the posttest survey was: "What was the most important thing you learned from your VITA experience?" Comments from the VITA students who responded to this open-ended question stressed practical skills (applying tax law), interpersonal and communication skills (interacting and communicating with clients), and citizenship (contributing to the community). In addition,

the students often mentioned exposure to real-world situations and increased cultural/diversity awareness. These responses support the notion that participation in VITA results in skill development far beyond what students experience in classrooms. They also indicate that VITA, as a service-learning activity, helps students develop many of the functional and personal competencies desired by the AICPA (1999). Representative student comments appear in Table 5.

An initially surprising result was that the problem-solving hypothesis (H5) was not supported by the data, and was significant in the opposite direction of our prediction. Students participating in a VITA service-learning experience are exposed to a learning environment that is much more complex than a classroom setting. VITA students are expected to provide a professional service to a diverse set of community members. There is pressure on the VITA students to be accurate in their work, as the tax returns they prepare are legal documents that have financial repercussions for their clients. VITA students are expected to understand tax law and the many forms that are used to complete tax returns, they are often required to research tax issues for clients, they must learn how to use tax software, and they must ensure that tax returns are completed accurately.

While having a complex learning environment is one motivation for faculty to participate in VITA, it also creates a challenging assignment for students. Some VITA students may become frustrated by the multiple degrees of variation encountered in preparing the returns, in the diversity of the client base, or in their own inabilities to apply their classroom tax knowledge to preparing tax returns for their clients. Accounting students are typically among the highest performers in their academic units, and they may come into the service-learning experiences over-confident about their abilities to solve numerical problems. They find that the complexity of the hands-on tax preparation world is unlike anything they have encountered in a sterile textbook or classroom setting, and this may cause them to lose some confidence in their problem-solving skills. Students in the control group do not face this dose of reality, and may be over-confident in their problem-solving skills. VITA students may be disillusioned by the complexity of the VITA experience. While this initially may seem detrimental to student learning, students may actually benefit from encountering situations that challenge them and teach them how complex the real world actually is.

Another possible influence on students' problem-solving confidence is the amount of faculty support the VITA students received during the VITA sessions. If students in VITA sessions were uncertain about what to do and

Table 5. Student Comments on Their VITA Experience.

What was the most important thing you learned from your VITA experience?

Practical skills
- Applying the tax laws and regulations learned in class to real-life situations.
- Knowing how to find answers is more important than knowing all the answers.
- How to prepare taxes, where and what certain schedules are, and tax rules.
- Applying classroom knowledge to practical situations.
- How to research issues and explain the interpreted law to clients.
- ''Real world'' experience working with taxes.
- How to apply my textbook knowledge to the real world, how to research tax problems and deal with problems that arise with clients, and how to communicate effectively.

Interpersonal and communication skills
- Communication skills from working with a client face-to-face.
- How to communicate tax information to the public.
- Learning to communicate with individuals of various cultures.
- It is important to connect with the clients.
- Face-to-face client interviews and handling myself in tough situations.
- How to explain the tax code to clients.
- How to communicate with people of all walks of life.
- How to communicate with many different people, especially those who do not understand the tax law.

Citizenship
- A little contribution for the community can make a big difference.
- Working with people of many ages and income levels opened up my eyes to the rest of the community instead of just working with college students.
- Even though I am young, I can better the community around me.
- How to work with people that are disabled in any way.
- That helping others cannot only benefits the individual receiving help, but also a large group of other community members.
- That the community needs accounting students' assistance more than we realize.
- Community service is important and worthwhile.
- That I am able to help the community in more ways than I ever thought before.

Problem solving
- The real world is a lot more complicated than homework.
- Not every problem is easy to figure out and sometimes you just have to stop and ask for help.
- I learned to communicate with people and solve problems.
- That I can tackle difficult problems (tax returns) given the right resources.
- The importance of having every piece of information possible.
- Interacting with people and solving problems on my own.

Table 6.   VITA Participants' Satisfaction With VITA Experience
($n = 134$).

Statement	Mean	Standard Deviation
Helping people in the VITA program is worthwhile to me personally.	6.28	0.92
I would participate in VITA again if the opportunity arose.	6.31	0.92
I would recommend to a friend that he or she participate in VITA.	6.35	0.83
My participation in VITA makes me feel that I am contributing to the community.	6.22	0.93
I would encourage people to have their taxes prepared at a VITA program.	6.07	1.05
I am satisfied with my VITA experience.	6.31	0.88

were unable to get support from a faculty member, they may have become less confident in their problem-solving abilities. We did not collect data about the amount or quality of the student–faculty interaction; we therefore recommend that future studies include these items as potential mediating variables.

The VITA students in this study also seem to be quite satisfied with their VITA experience. We asked these students in the posttest survey to indicate their agreement with a set of statements using a seven-point Likert scale (1 = "strongly disagree"; 7 = "strongly agree"). As reported in Table 6, the mean response for each of the six statements was extremely high, ranging from 6.07 to 6.35. The students found the experience personally worthwhile, would participate in VITA again, and would recommend to their friends that they participate in VITA. They also felt that they were contributing to the community and that they would encourage people to have their taxes prepared by a VITA volunteer. We found no significant between-school differences on the satisfaction outcomes.

LIMITATIONS AND FUTURE RESEARCH

This exploratory study is one of the first to analyze empirically the service-learning benefits of student participation in a VITA program. This study would be strengthened by the random assignment of students to a service learning and control environment. Although students from eight universities were involved in the study, future research would benefit from an even

broader university and student base. We did not assess the amount or quality of student–faculty interaction, and we suggest that future studies pay closer attention to service-learning program characteristics and structure in order to evaluate potential differences in outcomes related to faculty interaction and other program characteristics.

We also suggest that future research assess actual changes in functional competencies related to a VITA experience. We would add a reflection variable to the study as Eyler and Giles (1999) have shown reflection to be an important aspect of service learning. Reflection is a difficult construct to measure, but developing a valid reflection metric would aid future service-learning studies. We also suggest that researchers explore the possible mediating effects of other service-learning experiences of students, as our analysis showed this to be a significant covariate. Finally, we suggest that future research evaluates the effects of other accounting-related service-learning experiences on student outcomes.

CONCLUSION

This study contributes to the literature by empirically analyzing the service-learning benefits of university-based VITA programs. Using a robust design for a service-learning analysis, we found support that VITA students – as compared to a similar group of accounting students who did not participate in VITA – were significantly more confident in their practical skills, citizenship skills, and personal responsibility skills after their VITA experience. They also had a stronger sense of school pride and more confidence in their interpersonal skills. This demonstrates that students who participate in VITA develop skills consistent with the functional and personal competencies desired by the AECC (1990) and the AICPA (1999). VITA students actively participate in the learning process and learn by doing, leading to development of their communication, intellectual, and interpersonal skills. We also found that the problem-solving confidence of the VITA students declined after the VITA experience. We encourage researchers to continue this line of investigation by refining and expanding the measurement scales and by identifying possible mediating variables. We also strongly encourage tax accounting faculty who are not involved with a VITA program to consider getting involved with such a program because of the demonstrated positive learning effects VITA participation has on students.

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APPENDIX. SCALE ITEMS

SELEB dimensions:

Practical skills
1. Organization skills
2. Applying knowledge to the "real world"
3. Workplace skills

Interpersonal skills
1. Ability to work with others
2. Communication skills
3. Leadership skills

Citizenship
1. Ability to make a difference in the community
2. Social responsibility and citizenship skills
3. Understanding cultural and racial differences

Personal responsibility
1. Ability to assume personal responsibility
2. Social self-confidence
3. Gaining the trust of others

Problem solving
1. I have the ability to solve most problems even though initially no solution is apparent.
2. When faced with a novel situation, I have confidence that I can handle problems that may arise.
3. When confronted with a problem, I am sure I can handle the situation.
4. I trust my ability to solve new and difficult problems.

5. When I make plans to solve a problem, I am certain that I can make them work.
6. Given enough time and effort, I believe that I can solve most problems that confront me.

School pride
1. I feel I am a part of this college.
2. In my actions I like to feel that I am making some effort not just for myself, but for the college as well.
3. I am quite proud to be able to tell people that I am associated with this college.
4. To know that my own actions have made a contribution to the good of the college would please me.

STUDENT PERCEPTIONS OF WEB-BASED HOMEWORK SOFTWARE: A LONGITUDINAL EXAMINATION

Cindi Khanlarian, Evan Shough and Rahul Singh

ABSTRACT

Web-enhanced instruction is increasingly pervasive in higher education. Homework assignments and exams are increasingly completed online. Instructors evaluate the effectiveness of educational tools, such as web-based homework (WBH), in part through student performance that can be affected by students' motivation. Thus, changes in students' motivations and perceptions during an academic term can affect our assessment of the efficacy of the educational tool depending on when our assessment is conducted. No current studies identify variations in student perceptions of educational technology over time. Better understanding the changes in student perceptions of educational technology as they complete a course of study may help educators develop more effective instructional and pedagogical strategies. Our study explores how students' attitudes toward WBH change with use.

B. F. Skinner (1950) defined learning as "a change in probability of response." His studies demonstrated that the shorter the time between the learned behavior and the reinforcement the stronger the response. He criticized the educational system that assigned homework to students, required them to complete it at home, return to school, submit to the teacher, and then receive feedback at a later time. He said, "(I)it is surprising that this system has any effect at all" (Skinner, 1954, p. 91). Most of Skinner's observations were conducted longitudinally, since learning is a process and as such changes over time. Based on Skinner's work, behaviorists believe that human learning can only be studied by examining and analyzing observable and quantifiable events such as watching a student work a problem, receive the feedback, and complete a similar problem. According to Skinner, if the feedback is immediate, learning should take place and can be measured by the student's performance on the next problem.

As educators continue to adopt web-enhanced instruction, assessment mechanisms such as homework assignments and exams are increasingly done online. Technology has been adapted for use as a reinforcement technique and is being used nationwide at the university level in the form of web-based homework (WBH). Software often accompanies a course textbook or is accessible over the web to supplement and support student learning. When a student logs into the WBH and works on problems, the software provides instantaneous feedback to the student on his work and progress. It is very important for educational research, as well as research in functional areas, to study how online education and online assessment impact students' performance and learning. In particular, it is critically important to understand how the online assessment software impacts students throughout the course of the academic term. It is useful to study the changes in such motivations, perceptions, and impacts of the educational technology over the period of the academic term: the semester. *However, after an extensive literature review we did not find any studies on how students' perceptions of WBH change over the course of an academic term.* Understanding whether students' perceptions of technology change over time can help inform educators in the development of effective instructional and pedagogic strategy. Evidence describing the longitudinal changes in student perceptions is lacking in the current literature and our study attempts to fill this gap.

In this study we examine student perceptions of WBH for grading their accounting homework. WBH should be beneficial since it gives immediate feedback, which is particularly valuable when students work on new

concepts to encourage nascent skill sets. However, we do not know how students' attitudes and perceptions on using WBH change over time. Theory suggests that these will affect a student's intention to use and his continued use of the software (Davis, 1989; Bhattacharjee & Sanford, 2006). The purpose of this study is to describe how student perceptions of WBH, including its usefulness and ease of use, change over the course of a semester. Information on this will help educators incorporate WBH in the curriculum effectively and manage student engagement during the course of the semester.

This chapter is organized as follows. The following section discusses the theoretical foundations of the chapter and hypotheses development. We then present our research design, including the approach and setting of the study, followed by the results and a discussion, including some analysis and conjecture based on our observations and our understanding of the literature.

THEORETICAL FOUNDATIONS AND HYPOTHESES DEVELOPMENT

Use of Technology for Learning

Thorndike (1912, p. 165) wrote, "If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print." Skinner (1986) created a "teaching machine" that used "programmed instruction." It is very much like the WBH software used today. Educational technology is designed to be an enabler of student learning. It can present immediate feedback as positive reinforcement if the answer is correct. Each response using the software should provide an experience that establishes a foundation for more learning. Homework has traditionally been assigned as a way to promote learning. Cooper (1989a, 1989b) and Cooper, Robinson, and Patall (2006) reported that the benefits of homework increased with the age of the student, but the studies stopped short of examining homework effects on college students. This research found evidence that working homework problems increased immediate achievement and learning as well as future academic and nonacademic endeavors as it encouraged persistence and general practices that facilitate learning.

Hypotheses Development

In the following sections, we discuss the theory that motivates our development of hypotheses and present the hypotheses to test the longitudinal changes in student perceptions and motivations in the use of WBH software. Specifically, we develop five constructs that have been previously used in systems research to understand the variations and changes in students' perceptions and experiences in using the homework-grading software over the course of the academic term.

Perceived Ease of Use of Web-Based Homework Software

Bloom (1968) suggests that perseverance (with feedback) is a component of mastery learning. His studies indicate that students who find the effort rewarding are more likely to spend more time on a particular task. However, he also states that if a student is frustrated in his learning, "(H)he must (in self-defense) reduce the amount of time he devotes to learning. While the frustration level of students may vary, we believe that all students must sooner or later give up a task if it is too painful for them" (Bloom, 1968, p. 6). Ease of use is important for WBH to be effective to prevent frustration from causing student "shut down."

The technology acceptance model (TAM) (Davis, 1989) was built on the theory of reasoned action (Ajzen & Fishbein, 1980). Davis proposed that a person's intention to use software was partly based on their perceived usefulness and the perceived ease of use of the technology. Davis' work suggested that perceived usefulness was a better indicator of future use than the perceived ease of use of the technology. These two constructs are very important and well-researched aspects of information systems research. Based on TAM, we can conjecture some propositions about student perceptions of the educational technology. Will the perceived usefulness and perceived ease of use of the software still influence students' use and continued use of the technology? If students perceive the educational technologies as easy to use, they should complete more homework. In addition, if students perceive that the educational technologies are useful to them, they should complete more homework. Changes in these perceptions over the course of the semester would affect the students' use of, and learning with, WBH.

At the time of our study, the university required all entering freshmen to have a laptop. The state educational system also required all eighth graders

to be proficient in basic computer skills. As faculty, we have seen a general acceptance of technology by the students as evidenced by numerous cell phones and netbooks. The TAM (Davis, 1989) suggests that ease of use leads to actual use. Another study (Green, Reinstein, & McWilliams, 2000) found that students would recommend the use of interactive course software to others. Mendoza and Novick (2005) used a longitudinal study and found that a test of usability was actually a test of learnability. As software users gained experience over time, their level of frustration dropped, the causes of their frustration changed and their responses to episodes changed. They suggest that over time many of the events that create frustration in novice users become very insignificant as they become more familiar with the software. We hypothesize that students find WBH software easy to use and that continued use of the software will engender increased positive perceptions of the ease of use of WBH. This is explicated in our first hypothesis.

> **H1.** Students have a positive perception of the software's ease of use and this perception increases over time.

Perceived Usefulness of Web-Based Homework Software

Technology has been found to be useful as an interactive educational learning tool (Lippincott, Matulich, & Squire, 2006). Current research has shown the use of software in education to be at least as good as using paper and pencil. Palocsay and Stevens (2008) studied the use of software in business statistics classes and found that the student's GPA was the only significant predictor of course grade or exam score. They suggested that the type of homework system used in a course did not make a significant difference in the student's performance. Another study found a significant relationship between students' GPAs, homework scores, and course grades (Dillard-Eggers, Wooten, Childs, & Coker, 2008). This study also reported that 69% of the students reported technical problems while using educational software; 55% believed the use of online homework affected their understanding of the topic and problems compared to alternative methods "much higher" and 49% reported "much better" learning compared to pencil and paper homework (choices included "much better," "neutral," or "much worse").

Studies of WBH used in accounting courses suggest that students prefer using the software since it gives immediate feedback and is available through

the Internet (Lippincott et al., 2006). Peng (2009) also studied accounting WBH and reported significantly higher levels of intrinsic motivation and computer efficacy among students who reported the software was useful. However, Heath (2008) reported significant differences in the *cognitive effort* used by students preparing paper tax returns compared to those preparing computer-based returns. In short, the current literature on WBH reports that it appears to be useful to the student but does not appear to engage significant cognitive efforts and does not seem to significantly affect a student's performance in the class.

Goodhue and Thompson (1995) added to the TAM by introducing the task-technology fit construct. They suggested that "for an information technology to have a positive impact on individual performance, the technology must be utilized, and the technology must be a good fit with the tasks it supports." They defined task-technology fit as "the degree to which a technology assists an individual in performing his or her portfolio of tasks" (Goodhue & Thompson, 1995, pp. 215–216). As educators, we believe the purpose of homework is to help the student learn and master the subject area. In preliminary interviews with students we found evidence that suggests they view homework as a task to be completed as quickly as possible so they can check it off their list, then complete the course, and be one step closer to graduation. Edmunson (1997) refers to this generation of students as being steeped in consumer culture and viewing a college degree as a consumer good. Their goal consists of obtaining the degree and cognitive engagement does not appear to play a role in the completion of their task. The finish line appears to be more important than the race. It is interesting to observe if this perception changes as students utilize the WBH more over the course of the semester.

Use of educational technology provides students with instant feedback and allows them to try again if they are wrong. Based on previous study (Lippincott et al., 2006), this should impact students' perceptions of the usefulness of the software. Continued use will also give them time to try out some of the features of the software such as hints, calculators, and a connection to an e-book, making it seem to be even more useful. The usefulness will motivate them to complete all their assignments. We expect that the perceived usefulness of the software will increase over time during the course of the semester.

H2. Students have a positive perception of the usefulness of the software and this perception increases over time.

Cognitive Engagement and ''Fun'' in using Web-Based Homework Software

Cognitive psychology research has shown that generating information allows one to remember it better than just reading it (Bertsch, Pesta, Wiscott, & McDaniel, 2007). This is referred to as the generation effect. In education, assigning homework problems is an attempt to encourage students to generate the appropriate responses. Research on the generation effect (Hirshman & Bjork, 1988) implies that the more assignments and problems students work, the more they will learn. Many other studies have found support for the practice of assigning homework including a report that repeatedly answering questions about material helps one retain the information significantly better than without answering questions (Roediger & Karpicke, 2006; McDaniel, Howard, & Einstein, 2009).

Research on cognitive absorption and the ''fun'' factor present in some computer use suggests that it is composed of five dimensions: feeling dissociated from time, being immersed in the program, enjoying the activity, having some control over the outcome, and having a measure of curiosity (Agarwal & Karahanna, 2000). The holistic experience is an antecedent to perceived usefulness, perceived ease of use, and intention to use along with a measure of self-efficacy.

The ''fun'' construct in information systems research is based on the idea that being cognitively engaged and engrossed in an activity, being curious, and having control over the software combine to make it enjoyable. Peng (2009) found increased intrinsic motivation in a study of WBH. Similarly, we believe that intrinsic motivation is related to the fun construct and that this perception of enjoyment will increase over time as students grow more familiar with the materials and become more adept at using the computer program.

H3. Students have a positive perception of the ''fun'' value of the software and this perception increases over time.

System Reliability and Web-Based Homework Software

System reliability is dependent on use but is also related to user satisfaction (DeLone & McLean, 1992). Software reliability is defined as the probability of failure-free software operation for a specified period of time (Yang & Xie, 2000). But reliability can also involve dropped network connections, long

download times, hard-to-find features, and error messages (Ceaparu, Lazar, Bessiere, Robinson, & Shneiderman, 2004). In our study, we expect that the more the students enjoy using the software and the fewer technological problems they find, the more homework they will complete. Changes in the perception of the software's reliability, positive or negative, from a technological as well as subject-matter perspective are important to understanding students' perceptions and use of the technology.

A person's perception of software reliability is either confirmed or refuted with time and use. It is important to note that we are interested in examining the changes in the students' *perception* of reliability of the WBH over the course of the academic term. Actual reliability of the software is an objective function of the software design and the technical architecture that supports the software. Perceptions of reliability are subjective measures that are influenced by the student and the student's social system. These affect how students view the importance of the WBH and its legitimacy and utility. Experientialists might say their perception would be based on their experiences with other software. Since we know the students have had many hours of experience in technology use, we expect them to respond in a positive manner. It seems illogical that we would ask them to purchase unreliable software. However, as they experience some of the glitches in the software we expect their perception of the software's reliability to decrease.

> **H4.** Students have a positive perception of the software's reliability but it will decrease over time.

Perceived Importance of Homework and Web-Based Homework Software

Simon's theory of bounded rationality (1991) suggested that people have so many decisions to make that they use their limited memory and abilities in the best way to *satisfice* as many of their needs as possible. Bounded rationality suggests that some students devote time to a subject only to realize that in order to make an "A" they will need to spend even more time than they already have. They may choose to take time away from another subject or lower their grade standards and accept the "B." Students understand that a college education is about learning and achieving; but many also maintain a job, outside activities and families in addition to their schoolwork. These place demands on time and attention. While students realize homework helps them learn, bounded rationality suggests they may seek shortcuts to help them complete assigned tasks. A task is the action(s) "carried out by individuals in

turning inputs into outputs'' (Goodhue & Thompson, 1995, p. 218). For students, the task is to successfully complete the homework assignment while learning the material or to pass the course as a step towards earning a degree. Technology that helps them to finish the task sooner is useful.

Bandura (1995) wrote that a person's motivation to act was based more on belief than on objectivity. The theory of self-efficacy proposes that the best motivation is a strong belief based on past mastery experience. In our study, we expect to observe that as students work homework problems and master the learning objectives of the course they will become more motivated and work harder to complete future assignments. Thus, the motivations and perceptions of self-efficacy should increase during the course of the semester as students become more familiar with the WBH and develop mastery experience over the environment and the subject matter. This is important to students' overall performance in the course.

College students, throughout their educational careers, have witnessed the value of homework in that the process of completing homework on time improves their performance. Cooper (1989a, 1989b) and Cooper et al. (2006) reported that homework aided the learning process and the generation effect proposes that working a homework problem will also improve performance. Dillard-Eggers et al. (2008) reported that students believed the WBH improved their grades in the class. Based on these studies, we believe the student will have a positive perception of the importance of homework and that perception will not change over time.

H5. Students have a positive perception of the importance of homework and this will not change over time.

In the following section, we present our research design to test these hypotheses.

RESEARCH DESIGN

The Department of Accounting at a large regional university reported that 25% of students received a "D," "F," or "W" (withdrew) from its introductory classes for nonmajors. Faculty teaching these courses required homework assignments but gave varying degrees of feedback and graded it differently. Some would give credit for attempts while others required the answers to be correct. The department devised a new model that weighted homework grades at 15–20% of the course grade and required that all homework be completed using various software packages offered by

publishers as supplementary educational technology. In the first week of class, students saw a demonstration of the software. They were asked to enter their answer to a homework problem and click "submit." If their answer was correct, they would see a green check. An incorrect response received a red X. The software provided an unlimited number of attempts and only the highest grade was recorded. Tutors were available about 20 h a week in the department and the professor was available either during office hours or through e-mail. The ability to make perfect scores on the homework assignments was limited only by the amount of effort a student assigned to the task.

Our initial sample was composed of 148 students in a large introductory accounting course. Only 113 students finished the course; the others withdrew for personal or performance issues. Approximately 60% of the class was female and 65% of the useable responses were from female students. Students were asked to complete a questionnaire at the beginning of the term after seeing a walkthrough of the software. They were given a version of the same questionnaire, adjusted for grammar and tense, eight weeks into the class and again near the end of the term. Fig. 1 provides a schematic of our research design.

Copies of the questionnaires are provided in the appendix. Questions from previous studies were used. The questionnaire inquired about their intention to use software and their intention to continue to use software to grade their accounting homework. Students answered using a five-point Likert scale. Completing the survey was optional, but a two-point bonus was added to each final exam grade for each survey completed, for a possible six bonus points (approximately 1% of the final grade) as an incentive to participate. Despite that only 89 students provided useable responses for all three questionnaires. We randomly selected and
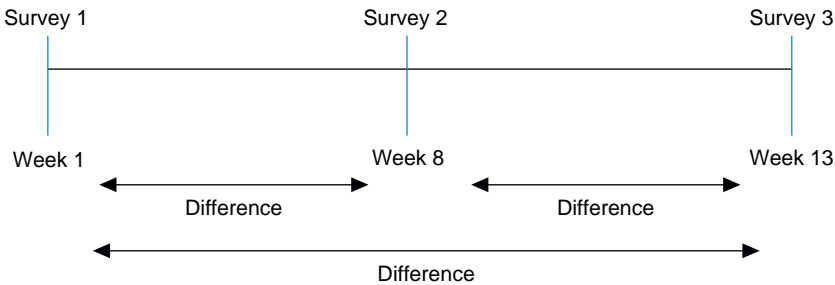
Fig. 1. Research Design.

interviewed some students about their use of the software to gain further qualitative and anecdotal insights into their perceptions of WBH.

RESULTS AND DISCUSSION

A factor analysis using a varimax rotation identified five constructs with eigenvalues above 1.0 that accounted for approximately 76% of the variance. Table 1 shows a listing of the constructs measured by the instrument with the associated reliability alphas per survey. A reliability coefficient of .70 or higher is usually acceptable and since adding items can increase Cronbach's α, our short questionnaire reflects the likelihood that each question in a group measured the same construct.

Table 1. Construct Composition and Cronbach's α.

Construct	Item: The Software …	Cronbach's α			Source of Survey Item
		t_1	t_2	t_3	
Usefulness	Is very useful in learning accounting Enables me to perform better on my tests Helps me make better grades	.832	.843	.802	Davis (1989)
Fun	Will be fun to use Will be entertaining Will be more fun that doing homework without it	.862	.794	.792	Agarwal and Karahanna (2000)
Ease of use	Will be easy to use Will be easy for me to learn to use Will be easy to operate	.808	.865	.846	Davis (1989)
Reliable	Will give the correct answer Will operate correctly Will be reliable	.784	.817	.801	DeLone and McLean (1992)
Intention to use	I plan to work on my homework until I get 100% Turning in homework on time is very important	.845	.743	.794	Ajzen and Fishbein (1980); Davis (1989)

Our purpose was to examine student perceptions of the software and to determine if these perceptions changed over time. We administered the surveys and collected the data when the course began, half way through the course and at the end of the semester, as illustrated in Fig. 1. We scaled the results so they centered on zero, with positive numbers indicating a positive perspective and negative numbers indicating a negative view of the construct. We developed scores for each of the constructs to establish whether perceptions towards the software were positive or negative at the time the data were collected. These scores were used to establish base values at the beginning of the semester and were used to calculate the differences between the student perceptions across the time periods. The factor scores were used to run t-tests to establish whether the differences between the construct scores are statistically significant. We then analyzed the data using statistical software to run paired t-tests to determine whether differences in survey answers were significant.

Table 2 shows the results of paired t-tests and factor scores of the responses on each construct for each of the three questionnaires. The responses to the first survey suggest that students agreed with statements that the software was easy to use and the assignments were important. The idea of finding the software entertaining or fun was initially met with a slightly positive response. They did not think the software would be useful or reliable.

Table 3 presents the results of our hypotheses testing. In Table 2, we use the construct score from survey 1 to establish an initial baseline for the construct. This is then compared to the construct scores in surveys 2 and 3 to determine the change in direction of the construct. For example, in the ease of use construct, the survey 1 construct score was 0.106, as shown in Table 2. This established that the initial value of ease of use was positive therefore the initial hypothesis was supported as shown in Table 3.

Our data and results suggest that there are significant changes in the students' responses throughout the semester. Table 3 summarizes the results of hypotheses testing based on the results shown in Table 2.

Our data show that the 17 students who obtained 100% on all homework assignments scored an average of eight points higher on the final exam than the other students. The 31 students who scored lower than 90% on all homework assignments had, on average, final exam grades that were six points lower than the class mean. Thus our results tend to support Cooper's (1989a, 1989b) research that shows working homework problems aids in the learning process. It also seems to support Bloom's finding that perseverance does matter, but we do not know if the perseverance is internally or externally motivated.

Table 2. Construct Scores and Results of *t*-Test for Significance.

Construct Initial Direction Expected Change	Construct Score			Difference Between		
	Survey 1	Survey 2	Survey 3	First and second survey	Second and third survey	First and third survey
Ease of use + *Increase*	0.106	0.04	−0.153	−0.059	−0.200*	−0.259**
Usefulness + *Increase*	−0.437	0.161	0.276	0.598***	0.115	0.713***
Fun + *Increase*	0.151	−0.215	0.04	−0.367***	0.279***	−0.088
Reliability + *Decrease*	−0.362	0.097	0.265	0.459***	0.168	0.627***
Intention/ importance + *Remain constant*	0.169	−0.105	−0.064	−0.275***	0.041	−0.233***

*Significant at .05 level.
**Significant at .01 level.
***Significant at .005 level.

In the following section, we discuss the results of testing each hypothesis and attempt to use existing theory to explain our observations.

Ease of Use

Hypothesis 1 stated that, "Students have a positive perception of the software's ease of use and this perception increases over time." This was not supported.

This construct was composed of student responses to the statements "It will be easy to use," "It will be easy for me to learn to use it," and "It will be easy to operate." Their initial responses show a positive perception of WBH's ease of use (Fig. 2). However, this perception decreased during the course of the semester. It is understandable that students would think that

Table 3. Hypotheses Results.

		Initial (Hypothesis Supported?)	Over time (Hypothesis Supported?)
H1	*Students have a positive perception of the software's ease of use and this perception increases over time.*	Positive (supported)	Decreased (not supported)
H2	*Students have a positive perception of the usefulness of the software and this perception increases over time.*	Negative (not supported)	Increased (supported)
H3	*Students have a positive perception of the "fun" value of the software and this perception increases over time.*	Positive (supported)	Decreased, increased partially (supported)
H4	*Students have a positive perception of the software's reliability but it will decrease over time.*	Negative (not supported)	Increased (not supported)
H5	*Students have a positive perception of the importance of homework and this will not change over time.*	Positive (supported)	Decreased (not supported)

WBH would be easy to use after so many years in the classroom, passing computer literacy tests and carrying around laptops. However, it is interesting to note that their perceptions changed over the course of the term. There is a significant decrease by mid-term and a significant decrease over the entire semester. This could be because the material increased in difficulty or because they found the software a little quirky. New material was sometimes presented in a new format, which meant the student had to deal with fresh topics as well as a novel way to report the results. Also, the software sometimes required "n/a" for no affect but at other times it required "N/A" (capitalized) as the appropriate response that indicated there was no affect on the accounting equation. In some questions, it wanted lower case "n/a" on one line and capitalized "N/A" on the next. One problem asked for the numbers to be written from largest to smallest, but
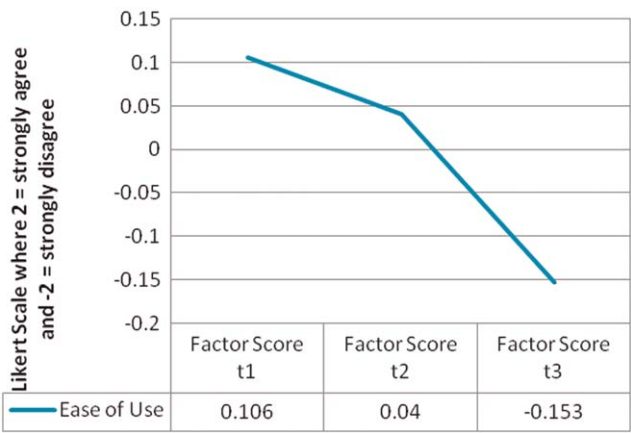
Fig. 2. Ease of Use.

marked it wrong when they did. However, since educational theories agree that experience is a good learning tool, we would expect the software to become easier with use. For the students to respond otherwise leads us to believe that repeated use of quirky software may not positively alter the perceived ease of use with time.

Usefulness

Hypothesis 2 stated that, "Students have a positive perception of the usefulness of the software and this perception increases over time." This hypothesis was partially supported.

The students did not have a positive opinion of the usefulness of the software before they started using it. However, that changed significantly during the semester. The largest gain in their perception of its usefulness occurred early in the semester but their feelings about it continued to be positive. Considering their response to the ease-of-use question discussed above, this is even more surprising since it seems to suggest that perceptions of usefulness increased while perceptions of the ease of use decreased (Fig. 3).

Davis' TAM provides some explanation of this when it states that usefulness was more important than ease of use in motivating people to adopt the software. Additionally, this also supports Goodhue's task–technology fit theory, which states that technology will be used if it helps complete a task.
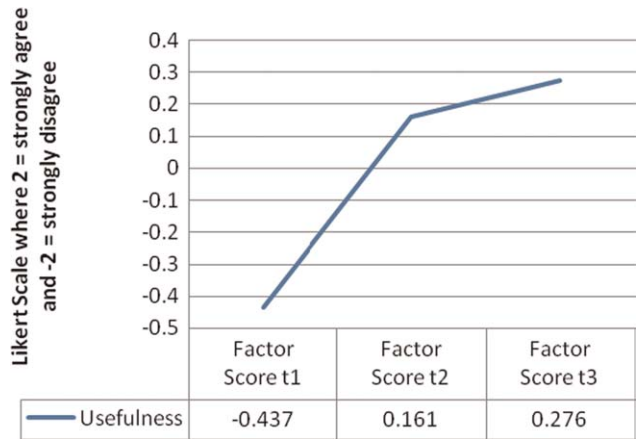
Fig. 3. Usefulness.

Fun

Hypothesis 3 stated that, "Students have a positive perception of the 'fun' value of the software and this perception increases over time." We observed partial support for this hypothesis.

The statements making up this construct were "It will be fun to use," "It will be entertaining," and "It will be more fun with the software than without it." It is surprising to see that their opinion of the software's entertainment value increased during the last five weeks of the term. The differences in the scores between the first and second surveys and the second and third surveys are both significant (see Fig. 4).

Agarwal and Karahanna's (2000) work suggested that cognitive absorption or "fun" was an antecedent to perceived ease of use and perceived usefulness. But playing the same game over time gets old and doing homework can be boring so seeing the positive increase in their response at the end of the term is surprising. Perhaps the concept of cognitive absorption is accurately measuring the student's curiosity, being immersed and having some control and the dip in the middle is a response to a mid-semester drop in energy or their frustration with the software. Maybe it is measuring their interest and curiosity at the beginning of the term and their satisfaction at being able to click and complete an assignment by the end of the term. Interestingly, there was no significant change from the beginning to the end of the term while there was a huge shift in the middle. Our results
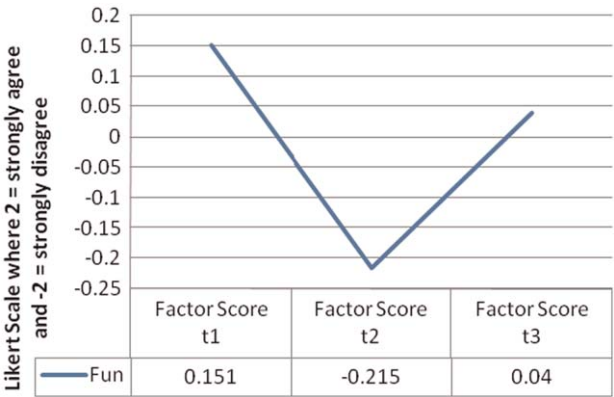
Fig. 4. Fun.

show a negative perception of ease of use and a positive perception of usefulness and fun. This finding is inconsistent with Agarwal and Karahanna's research. We believe more research is needed in this area.

Reliability

Hypothesis 4 stated that, "Students have a positive perception of the software's reliability but it will decrease over time." This hypothesis was not supported.

This construct is composed of student responses to three statements, "The software will give the correct answer," "will operate correctly," and "will be reliable." The students' perception of the software's reliability increases significantly from the first to the second measuring dates and the first to the third surveys (see Fig. 5). For students to respond negatively before they used the software suggests either they have generally negative experiences with software and technology or they have heard from other students that there are problems with this particular software. This is contrary to the hypothesis that stated the students' opinion of it would be positive and would decrease as they found glitches. From another perspective, the software was presented and the assignments were available and graded as scheduled on the syllabus, so perhaps the perception of reliability is based on its availability and timeliness rather than its ability to give correct
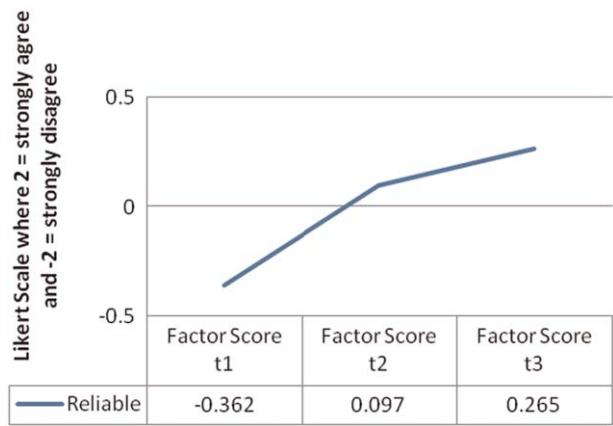
Fig. 5.   Reliability.

answers. Apparently, knowing there are hiccups in the software does not impede its overall reliability. It appears that their perception of the reliability of WBH supported their perception of its usefulness since both increased similarly.

Intention/Importance

Hypothesis 5 stated that, "Students have a positive perception of the importance of homework and this will not change over time." This hypothesis was not supported.

This construct was based on student response to two statements: "Turning homework in on time is very important to me" and "I plan to work on my homework until I get 100%." At the beginning of the semester, the students were full of good intentions and high hopes (see Fig. 6). It was important to submit the homework on time and to complete it all. It was important to learn the material and do a good job. But as the semester progressed, some of their enthusiasm seemed to wane. There is a significant difference in their scores between the first and second and first and third surveys. This does not support the hypothesis that stated the students' perception of the importance would not change over time. Perhaps after the semester break, students could tell what their final grade was likely to be and that could have changed their opinion as to the importance of the homework. We tried to run several regressions using the data. The only
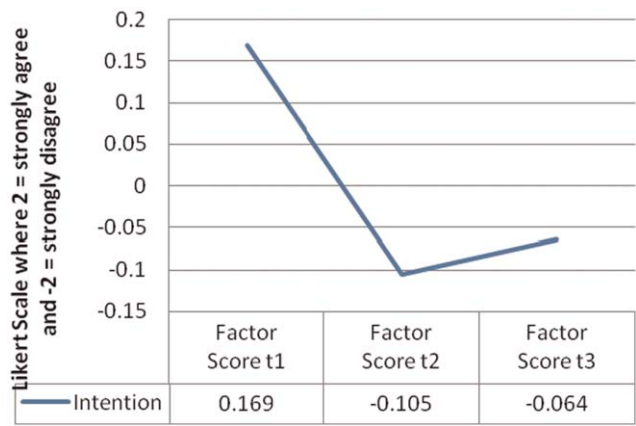
Fig. 6. Intention to Use.

good predictor of the student's final grade was their last homework assignment grade. This is logical because a student with an "A" average is going to work on the homework until he gets an "A," whereas a student who is failing will not work on it at all. Perhaps the key to helping students learn is to prevent this dip from occurring. Self-motivation dropped over the semester as students began to feel it was not so important to maximize their homework grades. Since Bandura (1995) relates belief and motivation, this decrease is troubling and leads to more questions. Do students lose motivation throughout every semester, or is this drop due to use of the software? Are the students completing assignments yet failing to learn the material thus making them believe that working homework is not helping them accomplish their goals? Additionally, our university has a policy that permits students to replace three course grades. In our interviews with students at the end of the course, some of them admitted that when they realized their grade was not going to be good, they gave up because they knew they could take the course again and replace the grade.

Additional Analysis

We ran additional regression analyses to test the correlations between students' responses as the independent variable and their final grades in the course as the dependent variable. When we ran a regression using students' perceptions of usefulness as the independent variable and their final grade in

the course as the dependent variable, we did not find a significant relationship. Additionally, we did not find evidence of any significant relationship between the usefulness of the software, intention to use the software, and ease of use as independent variables with grades as the dependent variable. In our study, the use of WBH did not increase student retention, motivation, or learning.

CONCLUSIONS

Even though homework accounted for 15% of their grade and they had unlimited attempts to make 100% each week, very few students took advantage of this opportunity. Bounded rationality would explain working until they were satisfied with their grade. They knew it was useful and they intended to use it, but only 20% of students earned 100% on each assignment, even though 80% of the students made 100% the first week. They started strong but lost a lot of steam. Even after promoting the use of the software, more than 25% of the students received a grade of "Withdrawn," "D," or "F." Perhaps students have a shorter motivational cycle and a 15-week semester is too long. Or maybe the educational process needs to find a way to encourage students to get over the mid-semester dip. Most of the students' responses reflected their desire at the beginning of the semester to do well but by the end of the semester, the course became less important in most aspects suggesting a level of cognitive depletion of the energy applied to the task.

Our results suggest support for the premise that usefulness of technology is more important than ease of use. The students cared about getting their tasks accomplished and the homework-grading software did that. They appreciated the immediate feedback and the opportunity to submit answers until they got it right.

At the end of the term, the instructors discussed the software and agreed the benefits provided were somewhat outweighed by the problems that resulted from technological tribulations or when students figured out how to beat the system (guessing and collaboration) or complained that the homework did not match the test questions (even though both were publisher provided). While these discussions were not subject to rigorous qualitative analysis, they did provide contextual information and shed light on our results. There was a learning curve for faculty but not just for operating the software. Faculty had to learn which problems to assign each week since we had to know when the software wanted a negative sign or

capital letters for an answer. There were also a few occasions where the answer was just wrong and we had to contact the publisher. In order for the software to truly grant teachers freedom from grading homework, it will have to allow students to enter an answer that is not from a drop-down window and still be able to read it correctly so that n/a equals N/A. If the software can work out the semantics of the accounting language maybe then it will live up to its potential as a true teaching aid.

Finally, as faculty members, we suggest that students not be allowed to have unlimited attempts to solve a problem. One student tried 205 times before she found the right answer – entering 1, then 2, etc. While unlimited attempts would seem to be supported by Bloom (1968) and Cooper (1989a, 1989b), our discussions with students lead us to believe the students approached homework without reading the book. They logged into the software, read the question, and checked to see what kind of answer was required. If the problem offered a drop-down window, they clicked until they got it right. If it was fill-in-the-blank, they tried different numbers until they either got it right or gave up and opened the book. For many questions, there is no generation effort required. Without the generation effect, homework becomes pointless as a learning tool but this could explain their strong positive feeling about the software's usefulness. It allows them to complete a task without much cognitive effort.

As in classes without WBH, we believed the students would be motivated by the ability to increase their final grade through completion of the homework, but it is possible their motivation was associated with the software. Our study did not control for that and we could have a confounding effect. We also did not track the effect of different types of questions that were presented on the WBH. There were matching, true/false, fill in the blank, drop-down windows, and multiple-choice formats. In retrospect, the presentation of the homework question may make a difference in student engagement.

The results from this study suggest that research is needed to better understand the impact of the constructs presented here on student performance by developing explanatory research models. In addition, the change in the impact over the course of an academic term is an area for future research. In this study, we provide a baseline measure of the student's attitudes and perceptions of WBH. We demonstrate that these perceptions are not static and do indeed change over the course of the semester. We believe that this understanding leads to the development of instructional and pedagogical strategies that are better informed, more accurate, and more attuned to the variations in student perceptions of the increasingly pervasive WBH in higher education.

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APPENDIX

Your Intention to Use Homework Manager Software

The accounting department is interested in your opinion of Homework Manager – the software you will be using in this class. You will see the homework problems in your book and in a slightly different version on the Internet. You will enter your answer and the software will tell you if it is right or not. It will not tell you the right answer but will tell you if it is right or wrong. You have an unlimited number of attempts each week to make 100% on the homework.

How important is each of the following factors (statements) to you *before using the software?* Please circle the level of importance with each statement using the following scale.

1	2	3	4	5	6
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Applicable

Homework Manager will be very useful in learning accounting.	1 2 3 4 5 6
Homework Manager will enable me to perform better on my tests.	1 2 3 4 5 6
Homework Manager will help me make better grades.	1 2 3 4 5 6
Homework Manager will be useful because it will tell me when I'm right or wrong.	1 2 3 4 5 6
Homework Manager will be fun to use.	1 2 3 4 5 6
Homework Manager will be entertaining.	1 2 3 4 5 6
It will be more fun doing homework with Homework Manager than without it.	1 2 3 4 5 6
Homework Manager will be easy to use.	1 2 3 4 5 6
It will be easy for me to learn to use Homework Manager.	1 2 3 4 5 6
Homework Manager will be easy to operate.	1 2 3 4 5 6
Homework Manager will give the correct answer.	1 2 3 4 5 6
Homework Manager will operate correctly.	1 2 3 4 5 6
Homework Manager will be reliable.	1 2 3 4 5 6
I am going to use Homework Manager because my teacher says it is important.	1 2 3 4 5 6
I am going to use Homework Manager because my friends are going to use it.	1 2 3 4 5 6
I am going to use Homework Manager because I like using technology.	1 2 3 4 5 6
I have some experience with online shopping.	1 2 3 4 5 6
I feel comfortable around computers.	1 2 3 4 5 6
Turning homework in on time is very important to me.	1 2 3 4 5 6
I plan to work on my homework until I get 100%.	1 2 3 4 5 6
Homework Manager will not be physically exhausting.	1 2 3 4 5 6
Using Homework Manager will not take much time.	1 2 3 4 5 6
Using Homework Manager will not give me physical discomfort.	1 2 3 4 5 6

PUBLISHING AND UTILIZING RELEVANT RESEARCH IN ACCOUNTING: THE IMPACT ON THE PERCEPTION OF EFFECTIVE TEACHING

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ABSTRACT

Prior research that attempts to empirically correlate research activity and effective teaching generates conflicting results. These contradictory findings contribute to the scrutiny that currently threatens to undermine accounting education and to impact funds currently directed toward the support of accounting research. The purpose of this study is to measure the impact of relevant research on students' perceptions of effective teaching. This two-phase study incorporates both a between-subjects decision-making experiment and a ranking instrument to measure the importance of various faculty attributes of teaching effectiveness. The two factors of interest in this study are whether a hypothetical accounting professor (1) conducts and publishes relevant research and (2) incorporates relevant research into classroom lectures. The results of the first phase of the study experimentally demonstrate that students enrolled in

accounting classes perceive the professor who does both (conducts and publishes relevant research and incorporates research into classroom lectures) to be significantly more effective than others. Specifically, the study identifies a statistically significant two-way interaction between the two factors of interest. This suggests that students perceive the professor's research to be a component of teaching effectiveness if, and only if, that research is incorporated into the classroom experience of the student. The second phase of the study finds that students generally rank both of the faculty research attributes lower in importance than other previously identified factors used to describe the professor.

In many ways, universities operate much like for-profit businesses in that they are motivated to provide desirable products to the public. One product provided by a university is an educated student. Students vote "with their feet" by selecting academic programs or universities that meet their individual needs. This selection process results in the allocation of tuition dollars to select institutions (Frank, Lowe, & Smedley, 2002). Students' perceptions of a quality education are vital to the success of the university. Students who attribute their eventual success to their education tend to financially support their alma mater. These students also improve the university's opportunity to recruit additional students. Employers that reap the benefit of successful and well-prepared accounting students indirectly reward superior accounting programs by continuing to hire graduates from the program and by contributing to the university.

In recent years, the quality of accounting education has been under heavy scrutiny. The Accounting Education Change Commission (AECC, 1990) has recommended that teaching be given a higher priority in accounting programs, and the American Assembly of Collegiate Schools of Business (AACSB, 1990–1992) has also called for more mission-based standards that could result in less emphasis on research (Read, Rama, & Raghunandan, 1998). With many state budgets now in crisis, universities and accounting programs are facing financial constraints that could result in reduced emphasis on the less visible areas of a professor's responsibilities, such as research and service. If students, administrators, practitioners, taxpayers, and society perceive research as unimportant, financial support could rapidly diminish. These constituents must recognize how important relevant research is in the development of successful professors if financial support is to continue (Frank et al., 2002).

The perceived quality of accounting education is based, in large part, on students' perceptions of the professors under whom they studied and learned. The typical professor's primary responsibilities include teaching, research, and service. Each of these three areas is commonly evaluated and used to support and enhance effective teaching (Brodzinski & Scherer, 1990). However, the call for more emphasis on (and time for) teaching by accreditation boards, educational organizations, and society should be a wakeup call to the academic profession. The universities' students, or paying clients, may not recognize the importance of all three of these job responsibilities, especially the relationship between conducting relevant research and effective classroom teaching. This is particularly true in business-related professions, where students do not observe the direct effect of research apparent in other disciplines, such as health-related professions and the sciences. In order to maintain research as an invaluable tool in the teaching profession, students must perceive the usefulness of this research as part of the learning process. Unfortunately, students are often exposed only to the teaching responsibilities of a faculty member and are relatively unaware of the other faculty responsibilities that may contribute to the overall effectiveness of a professor.

The purpose of this study is to examine student perceptions of what characterizes the effective accounting professor. In particular, the study examines the impact of conducting relevant research and incorporating relevant research into classroom lectures. The study examines the relationship between student perceptions and a hypothetical accounting professor in an experimental setting.

PRIOR LITERATURE: THE RESEARCH/TEACHING CONNECTION

Prior research that attempts to correlate the impact of research and teaching yields conflicting results regarding the value of accounting research. Various studies find positive, negative, and zero correlation between research productivity and teaching effectiveness.

Manakyan and Tanner (1994) conducted a study using student opinion surveys and research activities with accounting faculty that finds weak but statistically significant negative correlations between research output and teaching effectiveness. In a separate but similar study with management professors, Tanner and Manakyan (1992) find no relation between teaching

performance and research activity. Tanner and Manakyan (1992) also cite a study performed by Hoyt and Spangler (1976), which indicates no significant benefit to students from the instructor's research involvement. Faia (1976) suggests that research and teaching are mutually supportive activities, provided that research is not overemphasized.

Bell, Thomas, and Solomon (1993) cite several empirical studies that investigate the relationship between research productivity and teaching effectiveness, which provide minimal, if any, support for the relevant researcher/effective teacher relationship. Marsh (1984, p. 727) concludes " … there was virtually no evidence for a negative relation between effectiveness in teaching and research; most studies found no significant relation, and a few studies reported weak positive correlations." Feldman (1987, p. 229) concludes that "the relationship between research or scholarly productivity and overall evaluation of the teacher is not statistically significant; but note further that whether or not the relationship is statistically significant, with very few exceptions, the direction of the relationship is positive." Bell et al. (1993) note five other studies between 1971 and 1975 that report a statistically insignificant average correlation of .07 between teaching effectiveness and the amount of time spent on research.

While the studies that Bell et al. (1993) cite indicate little, if any, relationship between research and teaching, their own research results support a positive relationship between teaching and research. Their study of 473 accounting faculty members at 31 universities indicates a positive and statistically significant association between accounting teaching effectiveness and research productivity and no statistically significant evidence supporting any negative research productivity/teaching effectiveness hypotheses. The strongest positive associations were between research productivity and the preparation, knowledge, and coverage components of teaching effectiveness. In addition, publication in major research journals indicates the most consistent positive association with teaching effectiveness. The data for this study was generated using student and teacher evaluations and the number of publications produced by the teacher.

Lindsay and Campbell (1995) provide another study indicating a positive relationship between teaching effectiveness and research productivity in accounting faculty. These researchers utilize a regression model using the certified public accountant (CPA) exam pass rate as a dependent variable to represent teaching outcomes. Their study confirms a significant positive relationship between research productivity of faculty and the teaching outcomes measure. This relationship was measured over a four-year period, which covered eight CPA exam dates.

From a different perspective, Gribbin and Karnes (1995) survey practicing accountants from 52 CPA firms and find that practitioners did not feel that a faculty member must pursue both research and teaching to be a competent teacher or researcher. The practitioners surveyed placed high values on quality teaching. The authors claim that practitioners apparently thought research had less value than teaching based on the results of perceptions that quality researchers were over-rewarded.

In an effort to draw some conclusions from this body of research, Hattie and Marsh (1996) conduct a meta-analysis of 58 studies designed to determine the relationship between research and teaching. Their results indicate no relationship between teaching and research.

One of the difficulties in interpreting the results of these studies is the varying definition and measurement of effective teaching. According to Hildebrand (1973, p. 42), the measures of effective teaching based on the success of learners and/or their progress toward stated educational objectives can ''scarcely be measured by valid means.'' Controversy abounds on how to define or describe the role of this "effective" and inspiring professor. Instead of synergy between the professor's teaching, research, and service responsibilities, debates rage around the emphasis of quality teaching over quality research (Beaver, 1992; Boyer, 1992; Elliot, 1991; Gribbin & Karnes, 1995).

Hildebrand's (1973) research avoids the quibbling over effective teaching definitions by identifying the characteristics of effective teachers. Accordingly, most of this research utilizes the most commonly identified characteristics of effective teaching to address effective teaching albeit in different ways.

A second difficulty of evaluating prior research is the lack of agreement on the definition of research productivity as it applies to teaching activities. Research productivity is typically measured by the quantity and quality of resulting publications. According to Paul and Rubin (1991), quantity measures the time and effort invested in research, and quality measures the ability to determine which ideas are most fruitful. They suggest that student evaluations are indicative of classroom presentation rather than the command of knowledge in the field. In other words, a professor can be a great teacher of irrelevant information. Therefore, the publication record and activity of the faculty member is the "other measure" necessary to determine whether a teacher is effective.

Others have criticized Paul and Rubin for their "publish or perish" approach to link research to effective maximization of classroom content and instruction (Dyl, 1991; West, 1991). Dyl (1991) questions the use of research to determine the ability to discern between what is important and

what is unimportant since he claims most scholarly research has little practical relevance. West (1991) also argues that utilizing publication records to measure an effective teacher misses the mark of evaluating pedagogical skills and falls short of assessing the appropriate course content. He believes the "publish or perish" standard encourages faculty to teach what is of interest to them and not what is relevant to undergraduates. Both Dyl (1991) and West (1991) agree that good teaching involves more than research and merely choosing the right materials. Teaching is not just the transmission of information; it should involve a stimulating, thought-provoking experience that is "crackling with intelligence" (Wilshire, 1990, p. 24). Research must be defined as not merely the number of publications produced by a professor, but also in terms of the number of those publications relevant to the classroom experience. This measure of research would be difficult to determine in a direct manner.

In summary, prior research focuses on the relationship between research productivity and teaching effectiveness using various definitions and measures of these variables. This research generates mixed results. Beaver (1984, p. 34) states that there should be no conflict between research productivity and teaching effectiveness. If there is a conflict, "something is fundamentally wrong with either the research process, the educational process, or both." Prior research has neglected to consider the impact of incorporating *relevant* research into classroom lectures and its impact on students' perceptions of teaching effectiveness.

PRIOR LITERATURE: THE IMPORTANCE OF STUDENT PERCEPTIONS

As stated earlier, having a university's constituencies perceive research as important may well impact funding for faculty research. Students represent one of those constituencies. A number of studies examine students' perceptions of research. The AACSB's "Impact of Research" (2008) document cites studies that indicate a positive perception of schools that engage in faculty research. In particular, Becker, Cotton, and Grizzle (2003) note that students find schools engaged in faculty research to be attractive. They further find that such schools attract better students and have better qualified, larger pools of applicants.

Much research in education has been conducted concerning student perceptions in a classroom setting. Friedrich and Michalak (1983) find a

negative perception of research on the part of students. They find that researchers are perceived to possess less knowledge than nonresearchers and are less effective teachers. However, the subjects indicate that researchers require more work, set higher standards, and give lower grades.

Other studies find that students have a positive perception of research. Arnold (2008) finds that during the first two years of the bachelor's program, students display a negative perception of research and its impact on teaching effectiveness. However, these students display a positive perception after moving into the latter two years of their degree program.

A pair of studies also finds a positive perception of research. Both find that undergraduate and graduate students perceive research to be beneficial to their learning (Jenkins, Blackman, Lindsay, & Patton-Saltzberg, 1998; Lindsay, Breen, & Jenkins, 2002). More specifically, both undergraduate and graduate students find researchers to be more enthusiastic, more credible, and to possess more up-to-date knowledge. Graduate students, more so than undergraduate students, expect their professors to engage in research and expect the research be relevant to the courses they are teaching.

Given that students have opinions about the value of faculty research, how are these opinions created? Prior research indicates that the classroom experience forms these perceptions and that these perceptions impact the learning approaches (Marton & Booth, 1997; Prosser & Trigwell, 1997, 1999; Ramsden, 1992). Accordingly, whether or not research is used by the professor in teaching may impact or change the students' perceptions. Therefore, the students' perceptions of research and the use of research in the classroom continually impact each other.

If faculty can instill students with a positive perception of research, the learning experience may actually improve the student's classroom performance. Entwistle, McCune, and Hounsell (2002) state that a student's learning is affected less by the teaching method used and more by the perception of teaching. Others have found that a student's regard for learning materials and the selection of learning approaches are impacted by the student's perceptions (Entwistle, 1987; Entwistle, et al., 2002; Hassall & Joyce, 2001).

One criticism of the education research described above is that its approach has been too general (Jackling, 2005). This criticism has led to calls for studies concerning student perceptions that are more discipline specific (Eley & Meyer, 2004).

Ferreira and Santoso (2008) examine the impact of accounting student perceptions on performance in a managerial accounting course. Their findings demonstrate that students with negative perceptions at the start of

the course performed at a significantly lower level. The negative perceptions at the start of the course were significantly correlated with the end-of-course perceptions. Further, no significant relationship was found between end-of-course perceptions and course performance.

The findings were different for students with a positive perception of accounting at the beginning of the course. Positive perceptions at the start of the course did not significantly impact performance in the course. However, students' positive perceptions at the beginning of the course were significantly correlated with the end-of-course perceptions, but less so than students with negative perceptions. In addition, the end-of-course positive perceptions did significantly impact performance in the course. The results of this study, while mixed, do indicate that student perceptions impact the learning process.

In summary, it is clear that students possess perceptions about faculty research. These perceptions affect the students' choice of university, as well as their view of their professors in the classroom. Finally, there is evidence that a students' perceptions of research may impact their learning experience.

Hypotheses

The present study extends prior research by examining student perceptions of accounting faculty research involvement in an experimental setting. The first hypothesis addresses the impact of conducting and publishing relevant research on effective teaching. This is similar to prior studies cited earlier that attempted to find a relationship between publishing research and teaching effectiveness, with mixed results. This study extends prior research by experimentally manipulating descriptions of research involvement and activity in order to measure impact on accounting students' perceptions.

Because of the mixed results of prior research, the research hypotheses are stated in the null form. The first hypothesis examines whether involvement in conducting and publishing relevant research actually contributes to the perception that a teacher is effective.

H1. Conducting and publishing relevant research by an accounting professor does not impact a student's perception of the effectiveness of the teacher.

The second hypothesis addresses the unique contribution of this study. It examines whether incorporating and using relevant research in classroom lectures affect students' perceptions of teaching effectiveness. As discussed

earlier, scholarly research accomplishments must be operationalized. The successful scholar must also translate research into current material for class lectures and discussions for positive student perceptions to be maintained or created (Bell et al., 1993; Brodzinski & Scherer, 1990; Porter & McKibbin, 1988). If the scholar does not find mechanisms to transfer this current knowledge into curriculum and teaching materials, he has failed to fulfill his responsibility as an educator and has reduced teaching to an extrapolation of past and present data (Kaplan, 1989). Research that is not utilized may be viewed as irrelevant. Accordingly, the second hypothesis, stated in the null, is as follows:

H2. The incorporation and use of relevant research in classroom lectures by an accounting professor does not impact a student's perception of the effectiveness of the teacher.

RESEARCH METHODOLOGY

This research consists of two phases to measure the relationship between relevant research and the perception of effective teaching. The first phase involves a decision-making experiment that manipulates two independent variables, conducting and publishing relevant research *and* the incorporation and use of relevant research in the classroom. The purpose of the experiment is to determine whether accounting students report a higher perception of the teaching effectiveness of a hypothetical accounting professor who publishes relevant research and/or incorporates relevant research in the classroom. Teacher effectiveness is measured by the likelihood that the student will enroll in a course taught by the described professor.

The hypothetical professor in this study is described by publicly available teaching evaluations and by comments from other students. Accordingly, this study assumes that the accounting students participating in the study will utilize optimal, rational decision-making choices. Wilhelm and Comegys (2004) provide an excellent review of the research that supports how teaching evaluations and student-provided comments actually impact the course selection decision of students. The recent explosion in popularity of web sites such as www.ratemyprofessor.com attests to this fact. This study specifically examines the decision to choose a particular accounting professor for a required, additional accounting class. Subjects included both accounting and nonaccounting majors at the undergraduate and graduate levels.

Phase One of this study utilizes a between-subjects experiment to ensure that the students were unaware of the manipulation of the two independent variables. In Phase Two, a ranking instrument allows students to self-report the relative importance of various faculty attributes, including the publication of relevant research and the use of relevant research in the classroom.

Phase One Research Design

Table 1 illustrates a 2×2 full-factorial, between-subjects design used to examine the impact of an accounting professor's research on the students' perceptions of effective teaching. Students received a scenario requiring them to evaluate the likelihood of selecting a particular hypothetical accounting professor for their next accounting course. The independent variables, (1) conducting and publishing relevant research and (2) incorporating relevant research into classroom lectures, were manipulated by indicating whether the professor possessed each attribute or not. It should be noted that it is likely that many students may not know whether a professor is conducting research unless it is being incorporated in the classroom. However, the "conducting research" variable is included in the design to determine whether having such knowledge about a professor has any impact on a student's perception of the professor's teaching effectiveness. Further, the use of the term "relevant" research is used to indicate to the subjects that the research they are evaluating would be appropriate to the classroom. The term "relevant research" is applied in all four conditions. Each student received only one of the four different instruments. The experiment collects various demographic data to control extraneous variables.

Table 1. Phase One Research Design.

	Not Actively Involved in Conducting and Publishing Relevant Research	Actively Involved in Conducting and Publishing Relevant Research
Does not incorporate relevant research into class lectures	Cell 1	Cell 2
Does incorporate relevant research into class lectures	Cell 3	Cell 4

Note: The instrument used is described in Appendix A.

Phase One Research Instrument

The one-page research instrument presents a scenario in which students assume their degree plan requires them to take another accounting course (see Appendix A). The scenario provides eight attributes of teaching effectiveness based on common characteristics cited in prior studies (Bell et al., 1993; Brodzinski & Scherer, 1990; Hildebrand, 1973; Mounce, Mauldin, & Braun, 2004; Xiao & Dyson, 1999). The attributes are listed randomly, and six attributes are identical on all four versions of the instrument. While these six attributes of teaching effectiveness are not tested directly in this current study, prior research provides evidence that these factors are important predictors of teaching effectiveness. The remaining two attributes, the variables of interest in this study, relate to research and are manipulated across the four versions of the instrument. Students are randomly assigned to one of the four cells depicted in Table 1.

The experiment measures teaching effectiveness by asking subjects to assess the likelihood of selecting a course taught by the hypothetical professor for their next accounting class. The likelihood scale ranges from 0 to 10, with a response of 0 representing a low likelihood and a response of 10 representing a high likelihood. The subjects also provide five pieces of demographic information.

Phase One Sample and Data Collection Procedures

The sample for both phases of the experiment includes both accounting and nonaccounting majors from one doctoral-granting university and two nondoctoral-granting universities. The undergraduate student subjects were drawn from students enrolled in principles and intermediate accounting courses. The graduate student subjects were enrolled in graduate managerial accounting courses. However, some were enrolled in an MBA program and others in a Master of Accountancy program. As such, all subjects were enrolled in accounting courses although they are not necessarily accounting majors. The experiment uses three different institutions to gather data from students at universities with research missions and teaching missions.

Between the two phases, there are five different experimental instruments. There is one instrument for each of the four Phase One cells as shown in Table 1. These are described in Appendix A. The fifth instrument is the ranking instrument described below that is used in Phase Two (Appendix B). Each subject received one of these five instruments. Subjects receiving

one of the four instruments in Phase One did not participate in Phase Two to avoid tainting the ranking results of Phase Two. In total, 397 subjects participated in the study. A total of 332 instruments were completed as part of Phase One, and 65 subjects completed the Phase Two ranking instrument. The data for both phases were collected simultaneously.

Phase Two: Research Design

Recall that in Phase One, subjects were asked to give a global assessment of a hypothetical accounting professor based on eight attributes, including the two variables of interest. As an additional investigation, Phase Two assesses student perceptions of the *relative* importance of the eight individual attributes used in Phase One to describe the accounting professor through the use of the ranking instrument. As described above, the subjects completing the Phase Two instrument did not participate in Phase One. Phase Two of the research utilizes a ranking instrument to determine the perceived level of importance of two variables of interest (conducting and publishing research *and* incorporating research into lectures) relative to the other attributes commonly possessed by accounting faculty.

Phase Two Research Instrument

The ranking instrument instructs the students to allocate 100 points across the eight faculty attributes. Recall that two of these attributes are those manipulated in Phase One. The order in which the eight attributes are presented is randomly assigned and is consistent with the order of attributes used in Phase One. In addition to the ranking exercise, the survey collects the same demographic data as collected in Phase One. An example of this instrument is included in Appendix B.

Phase Two Sample and Data Collection Procedures

As previously discussed, no individual participated in both phases of the research. Students either completed the Phase One instrument or the Phase Two instrument based on random assignment. Recall that Phase One included 332 subjects, while Phase Two included 65 subjects.

ANALYSIS AND RESULTS

Phase One

Table 2 reports the descriptive statistics for students' demographic characteristics. In order to identify potentially extraneous variables, a separate analysis of variance (ANOVA) was conducted for each demographic variable with teaching effectiveness as the dependent variable. Major, defined as accounting students versus nonaccounting students ($F = 5.704$; $p = .018$), and grade point average ($F = 6.770$; $p = .010$) were both significant predictors of the effective teaching measure and, as such, were included as covariates in the overall analysis of covariance (ANCOVA) model to analyze effective teaching. All other demographic characteristics are insignificant predictors of the dependent variable, as follows: gender ($p = .529$), age ($p = .586$), level in school ($p = .783$), or university mission ($p = .381$).

Based on the scale used in the Phase One instrument, higher scores reported by the students indicate a greater likelihood that the student would enroll in the class and, as such, indicate a more favorable perception of teaching effectiveness. The means for each cell in the model are presented in Table 3. Note that the grand mean and the individual cell means are relatively high (grand mean = 8.15 on 10-point scale). This is not surprising

Table 2. Demographic Characteristics.

Characteristic	Mean or Frequency	Significance Level
Gender	49.3% Female 50.7% Male	$p = .529$
Age	23.92 years	$p = .586$
GPA[a]	3.29 on 4.0 scale	$p = .010$
Major[a]	49% Accounting 51% Other	$p = .018$
Level	62.2% Undergraduate 37.8% Graduate	$p = .783$
University mission	30% Teaching 70% Research	$p = .381$

[a]Found to be significant predictors of the effectiveness rating (at $p = .05$ level) in separate analyses.

Table 3.   Responses and Means for Effective Teaching Measure.

| | | The Professor Conducts and Publishes Relevant Research | | Marginal Means |
		No	Yes	
The Professor incorporates relevant research into class lectures	No	Cell 1 7.98 $n = 81$ Median = 8	Cell 2 7.96 $n = 78$ Median = 8	7.97 $n = 159$
	Yes	Cell 3 8.02 $n = 85$ Median = 8	Cell 4 8.60 $n = 88$ Median = 9	8.32 $n = 173$
	Marginal means	8.00 $n = 166$	8.32 $n = 166$	Grand mean 8.15 $n = 332$

because the instrument incorporates the previously identified predictors of effective teaching, and the hypothetical professor is portrayed as possessing each of these positive characteristics. Stated alternatively, the hypothetical professor is described as fair, thorough, a good communicator, experienced and qualified. As such, the mean ranking of all subjects was expected to be fairly high.

Recall that the first hypothesis examines whether relevant research conducted by an accounting professor will increase a student's perception of teaching effectiveness. The second hypothesis examines whether the incorporation of relevant research into class lectures by an accounting professor increases a student's perception of teaching effectiveness. While the marginal means in Table 3 suggest that such an effect may exist, a two-way ANCOVA is used to determine whether the differences in the effectiveness measure resulting from conducting research (8.32 vs. 8.00) and incorporating research (8.32 vs. 7.97) represent statistically significant differences. In addition, since the differences depicted in Table 3 appear to be most pronounced in cell 4, the model includes a two-way interaction term. Effective teaching, as measured by the likelihood that a student would enroll in the proposed accounting course, serves as the dependent variable, while conducting and publishing relevant research *and* incorporating relevant research into the class lectures are the manipulated independent variables. Since the demographic variables major and GPA were individually significant predictors of effective teaching, these variables are also

Table 4. Analysis of Covariance Results: Dependent Variable – Effective Teaching.

Independent Variables	Df	*F*-Value	*p*-Value
Publishes relevant research	1	2.838	.093
Uses relevant research	1	3.456	.064
Two-way interaction (publishes × uses)	1	5.363	.021
Covariates			
Major	1	7.043	.008
GPA	1	5.603	.019

Note: $R^2 = .085$ (adjusted $R^2 = .07$).

included as covariates in the analysis. Table 4 provides the results of the ANCOVA.

With regard to H1, the ANCOVA results indicate that the main effect of conducting and publishing research marginally impacts the student's perception of an effective accounting teacher ($F = 2.838$; $p = .093$). This evidence supports prior studies by Bell et al. (1993), Feldman (1987), and Marsh (1984), who find minimal support for a positive relationship between the relevant researcher and the effective teacher. Based solely on this main effect for conducting relevant research, we find marginal support for this positive relationship. With regard to H2, we find a marginally significant effect that provides some evidence that the accounting professor who incorporates research into classroom lectures is perceived by students as a more effective teacher ($F = 3.456$; $p = .064$).

However, as indicated in Table 3, it appears that an interaction exists between these two variables. Specifically, the increase in the teaching effectiveness rating resulting from the student's awareness that the professor conducts and publishes relevant research seems much stronger when the student is also aware that the professor incorporates relevant research into classroom lectures. As such, the ANCOVA model includes a two-way interaction term. The results indicate a significant ordinal interaction ($F = 5.363$; $p = .021$) between these two variables. As suggested by Kirk (1982), a significant two-way interaction confounds the interpretation of simple main effects and should be clarified by examining a graphical depiction of the means. The interactive effect of the two variables of interest is presented in Fig. 1.

As shown in Fig. 1, no significant difference exists in the responses of subjects in three of the four experimental treatments. However, when, and only when, the hypothetical professor conducts relevant research *and*
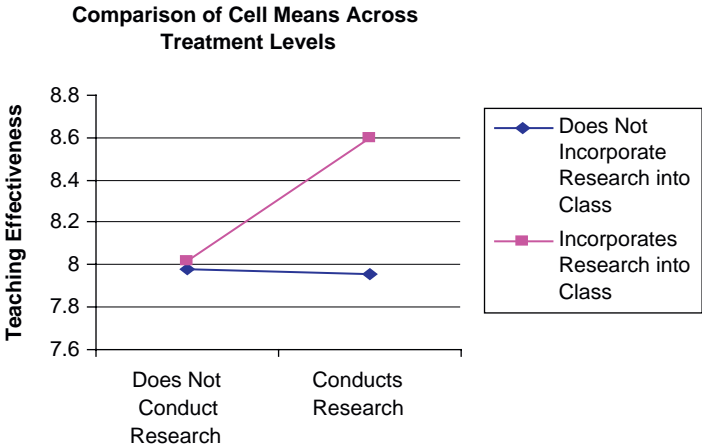
Fig. 1.   Analysis of Two-Way Interaction.

incorporates relevant research into class lectures is the teaching effectiveness rating influenced. It is apparent that the two-way interaction drives the marginally significant main effects for the two variables of interest. Accordingly, the present research provides support for both hypotheses when considered jointly, but not when considered independently.

Two additional findings related to the interactive effect of these two variables are noteworthy. First, as mentioned earlier, the high overall response from all subjects was not unexpected, since the six nonresearch factors described in the instrument are those found to be most desirable in the effective teacher from prior research and were all designed to reflect positively on the hypothetical professor. Accordingly, the appropriate relevant range of comparison between cells is small. The hypothetical professor described in each of the four treatment cells is an effective teacher, with or without the research activity. Accordingly, an increase in the mean response for cell 4 (the professor who is actively involved in conducting and integrating relevant research) to 8.6 from a mean of approximately 8.0 for the remaining three cells represents a substantial increase. Second, an analysis of the median response of subjects in each cell is revealing. It is important to note that the median response in cell 1, cell 2, and cell 3 is 8, while the median response in cell 4 (where the professor conducts *and* incorporates research) is 9. While the magnitude of the difference in means is not dramatic, it is important to recognize that the most common response of subjects in cell 4 is one full point higher on the response scale. This

between-cell median difference provides additional support for the interactive effect of these two research factors.

The ANCOVA model described in Table 3 also includes two covariates. Both of these demographic variables represent significant predictors of teaching effectiveness. Specifically, the accounting majors ($F = 7.043$; $p = .008$) and students with higher GPAs ($F = 5.603$; $p = .019$) in our sample rate teaching effectiveness higher. Since the hypothetical professor is an accounting professor, the higher rating by accounting majors may be expected. Perhaps the accounting majors have more respect for their accounting professors than those who simply take a few accounting courses in their undergraduate education. The finding that students with higher GPAs rate the hypothetical professor higher suggests that more successful students have a greater appreciation for the teaching effectiveness of faculty.

Phase Two

The Phase Two ranking instrument asks subjects to rank the importance of the eight attributes of teaching effectiveness used in Phase One. These eight attributes include the six descriptors held constant in the Phase One instrument, as well as the two attributes that were manipulated in Phase One. The results of the ranking instrument provide some evidence regarding the perceived level of importance of publishing relevant research and utilizing relevant research in the classroom relative to other attributes commonly found in accounting faculty. In order to compare the publication and utilization of relevant research to other faculty attributes, the mean responses for each attribute are calculated and presented in Table 5.

The results indicate that students perceive publishing relevant research and utilizing relevant research in the classroom to be less important than five of the other eight faculty attributes. Students perceive the publication of relevant research as the least important (mean weight = 6.03) of all the characteristics of an effective teacher. This result is surprisingly similar to the findings of the Mounce et al. (2004) study that finds publication of relevant research to be least important with a similar weight of 6.0 out of 100.00. Teaching experience, accounting experience, doctorate and CPA, and service activities also follow the same ranking order as the Mounce et al. (2004) study. The incorporation of research into class lectures (mean weight = 9.86) ranks sixth out of the eight attributes.

Despite these findings, the results of the ranking provide some validation of the results found in Phase One. While the research attributes are rated

Table 5. Mean Weights of Accounting Professors' Attributes.

Attributes	Total ($N = 65$)
The professor:	
has above average communication skills.	21.03
has the reputation of being fair, but thorough.	19.22
has several years of teaching experience at the college level.	12.58
has several years of practical accounting experience.	12.02
holds a doctorate in accounting and a CPA certificate.	11.46
incorporates textbook materials and relevant published research in class lectures.	9.86
is actively involved in accounting associations, civic groups, and university-sponsored programs.	7.80
is actively involved in conducting and publishing relevant research.	6.03
Total points	100.00

low, they are greater than zero and therefore may provide students with incremental information when making a decision about faculty. Also, this instrument presents the two research attributes separately, and the Phase One results indicate that it is the joint presence of conducting research and incorporating it into the classroom experience that affects student perceptions. Further research is needed to determine how combining the two attributes might affect the ranking.

It is recognized that the instrument used in Phase Two merely uses a ranking instrument on which no tests of statistical significance between the differing means were conducted. However, as stated earlier, Phase Two was designed to provide supplemental information to Phase One, the primary focus of this study. Phase One asks subjects to make a *global* assessment of a hypothetical professor based on the eight attributes cited in prior literature as attributes of effective teachers. Phase Two attempts to examine subjects' relative evaluation of each individual attribute. While the findings of Phase Two appear to lend some support to the Phase One results, further research would be necessary to make this inference stronger.

IMPLICATIONS AND INSIGHTS FOR
ACCOUNTING EDUCATORS

This study recognizes the importance of students' perceptions of a quality education. Students experience their professors' teaching daily, but it is

important for accounting educators to incorporate their research in the student's educational experience as well. For students to understand the importance of research, accounting educators must help students develop an appreciation for faculty research. This study finds that a student perceives the accounting professor to be more effective when he both conducts and publishes relevant research and also incorporates this research into the classroom. While simply conducting and publishing research is very relevant, students may never be exposed to this research if not incorporated into the classroom.

Recognizing the importance of incorporating research in the classroom may also help accounting professors choose research projects appropriate for class discussion. Admittedly, not all accounting research may be applicable to the accounting classroom. Accounting professors may pursue different types of research not directly relevant to course topics. On the other hand, if encouraged, professors may be able to find mechanisms to interpret various research studies for students and incorporate the research findings into meaningful curriculum material.

This study demonstrates the multiplicative effect of conducting and publishing relevant research while incorporating research into teaching activities. Students perceive professors who do both to be more effective, and accounting professors may find it beneficial to understand why students respond this way. The reasons for this perception could be the subject of future research. One explanation may be that when students have knowledge that a professor actively conducts and publishes research, the students view the professor as more competent when he presents research in the classroom. This would be consistent with the findings of Jenkins et al. (1998) and Lindsay et al. (2002). If so, accounting professors may improve the student perception of their teaching effectiveness by simply improving the student perception of their competence by incorporating research.

A second explanation may be that when students have knowledge that a professor actively conducts and publishes research while incorporating research into the classroom, the student makes an assumption that at least some of the research incorporated is the professor's own research. Education literature provides a stream of research concerning the concept of "authenticity" (Cranton, 2001). An "authentic" professor brings a "sense of self" into teaching and communicates with students in a more genuine way (Cranton & Carusetta, 2004). In light of the present study, if the accounting professor utilizes his own research in the teaching experience, the personal knowledge of the development and execution of the research might result in the professor being more "authentic." Accordingly, accounting

professors may be able to enhance students' perceptions of quality education with authenticity. Once again, future research is needed to determine if the assumption concerning the professor's research in the classroom is accurate and to pursue any connection to the concept of authenticity.

In summary, this study helps accounting professors realize the importance of student perceptions of research and its effect upon their perception of an effective teacher. Students not exposed to research may never fully appreciate the value of such research. Incorporating research into the teaching experience requires accounting professors to study relevant research topics and interpret research that is relevant for the classroom experience. Understanding the reasoning behind these student perceptions of research and an effective teacher also opens doors to new research and provides potential explanations for these perceptions. Students may perceive accounting professors who incorporate research into the teaching experience as more competent or even simply, more authentic. Overall, the accounting professor can benefit from this study by recognizing that the student perception of an effective teacher, and thereby a quality education, may be improved by incorporating research into the classroom experience.

SUMMARY AND CONCLUSION

This experiment examines whether students' perceptions of research activity and the incorporation of research into the classroom are important factors in how they rate teaching effectiveness. The results of this study are encouraging. In the first phase, results indicate that students, both undergraduate and graduate, perceive a contribution toward teaching effectiveness when a hypothetical accounting professor is described as actively conducting and publishing relevant research *and* incorporating research findings into the classroom experience. It is important to note that this finding is supported only when both of these factors are present. The marginally significant main effects are completely driven by the interaction between these two factors.

While the first phase of the study demonstrates that research activities positively impact perceptions, the second phase was designed to consider the relative importance of research activity when compared to other important characteristics. Students rank both the incorporation of research into the classroom and the process of conducting and publishing research as relatively less important than five of the other attributes of teaching

effectiveness. However, the instrument does not list an attribute that combines publishing with incorporating the results into class discussion. Given the interactive effect of conducting relevant research *and* incorporating that research into classroom lectures found in the first phase, this combined attribute might have been viewed more favorably by students. Future research is needed to further explore this possibility.

Four significant limitations in this study could affect its generalizability. First, the participating universities were not chosen randomly. The goal was to investigate the perceptions of both undergraduate and graduate students at research and teaching institutions. Although no differences in student perceptions were found based on the level of education or the mission of the university, the lack of random selection of the universities could affect the results. Second, this study used student perceptions to measure the impact of research on teaching effectiveness. While the findings were significant, the use of student perceptions is an indirect measure of teaching effectiveness. The generalizability of an indirect measure is not as good as a direct measure. Further research is required to find a direct impact of research in the classroom and on teaching effectiveness. Third, this study focuses on the perceptions of students in accounting classes. As stated earlier, further research in other disciplines is necessary to determine if the results of this study are generalizable. Finally, this study utilized a hypothetical scenario to measure perceptions. Responses could differ if the students were actually choosing an accounting professor.

In conclusion, the findings of this study establish a relationship between an accounting professor conducting and incorporating relevant research into the classroom and a student's perception of such a professor's teaching effectiveness. This study examines only a small portion of what constitutes teaching effectiveness. Much more research is required to further identify and test the factors that influence teaching effectiveness. In addition, additional research is necessary to consider the impact of accounting faculty research activity in the absence of other factors that positively influence student perceptions.

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APPENDIX A. PHASE ONE INSTRUMENTS

All four instruments included the following instructions and list of six attributes (randomized):

Assume that your degree plan requires you to take another accounting course. Several different accounting professors are currently teaching the course, and you have never taken a course from any of these professors. You have reviewed the publicly available teaching evaluations for each professor, and you find that each professor has approximately the same overall teaching effectiveness score. In addition, you note that each professor has approximately the same grade distributions for the course in question. From your discussions with other students about one of the professors, you have found the following additional pieces of information:

- The professor has the reputation of being fair, but thorough.
- The professor has above average communication skills.
- The professor has several years of teaching experience at the college level.
- The professor has several years of practical accounting experience.
- The professor holds a doctorate in accounting and a CPA certificate.
- The professor is actively involved in accounting associations, civic organizations, and university-sponsored programs.

Research-related attributes that were manipulated across the four versions of the Phase One Instrument:

Cell 1:
- The professor is not actively involved in conducting and publishing relevant research.
- The professor incorporates textbook materials but not relevant published research in class lectures.

Cell 2:
- The professor is actively involved in conducting and publishing relevant research.
- The professor incorporates textbook materials but not relevant published research in class lectures.

Cell 3:
- The professor is not actively involved in conducting and publishing relevant research.
- The professor incorporates textbook materials and relevant published research in class lectures.

Cell 4:
- The professor is actively involved in conducting and publishing relevant research.
- The professor incorporates textbook materials and relevant published research in class lectures.

All four instruments included the following instructions and the five demographic questions:

PLEASE CIRCLE A NUMBER ON THE SCALE BELOW TO INDICATE THE LIKELIHOOD THAT YOU WOULD ENROLL IN THE COURSE TAUGHT BY THIS PARTICULAR PROFESSOR.

0.........1.........2.........3.........4.........5.........6.........7.........8.........9.........10

LOW LIKELIHOOD   HIGH LIKELIHOOD

Please answer the following:

1. Undergraduate major _____

2. Undergraduate GPA _____ Graduate GPA (if applicable) _____

3. Gender Male _____ Female _____

4. Age _____

5. Academic Classification (check one)

    1. _____Freshman
    2. _____Sophomore
    3. _____Junior
    4. _____Senior
    5. _____Graduate Student

APPENDIX B. PHASE TWO INSTRUMENT

Assume that your degree plan requires you to take another accounting course. Several different accounting professors are currently teaching the course, and you have never taken a course from any of these professors. You have reviewed the publicly available teaching evaluations for each professor, and you find that each professor has approximately the same overall teaching effectiveness score. In addition, you note that each professor has approximately the same grade distributions for the course in question. From your discussions with other students about one of the professors, you have found the additional pieces of information listed below. Please rank the attributes by allocating 100 points among them. The more important the attribute the more points you should assign to the attribute.

_____ The professor has the reputation of being fair, but thorough.
_____ The professor has above average communication skills.
_____ The professor has several years of teaching experience at the college level.
_____ The professor is actively involved in conducting and publishing relevant research.
_____ The professor incorporates textbook materials and relevant published research in class lectures.
_____ The professor has several years of practical accounting experience.
_____ The professor holds a doctorate in accounting and a CPA certificate.
_____ The professor is actively involved in accounting associations, civic organizations, and university-sponsored programs.

100 Total Points

Each participant also answered the five demographic questions that are described in Appendix A for the four instruments used in Phase One.

UNAUTHORIZED ELECTRONIC ACCESS: STUDENTS' ETHICS, ATTITUDES, AND ACTIONS

Anne L. Christensen, Jane Cote and Claire K. Latham

ABSTRACT

Universities are expected to prepare accounting students to conduct themselves with integrity in all environments, including those that utilize information technology (IT). Our study investigates student integrity in an online environment to determine if students are honest about accessing unauthorized Internet solutions. We then evaluate student responsiveness to interventions designed to discourage unauthorized access using techniques suggested by the literature to foster ethical behavior. Our examination of such factors as moral development, moral identity, age, gender, and grade point average finds no significant relationship with student ethical behavior. More problematic, classroom interventions proved ineffective in preventing students from accessing unauthorized online solutions. We conclude with suggestions for developing and encouraging ethical behavior among accounting students in IT learning environments.

While extensive evidence of cheating among accounting and other college students exists (Abdolmohammadi & Baker, 2007, p. 51; Callahan, 2006,

p. 1; McCabe, Butterfield, & Trevino, 2006, p. 294; West, Ravenscroft, & Shrader, 2004, p. 178), the problem is exacerbated in an online educational environment (Molnar, Kleke, & Chongwatpol, 2008, p. 657). As online enrollments increase at a rate 10 times that of the total university population and more online resources are integrated into traditional accounting courses and the university environment (Albanese, 2001, p. 52; Allen & Seaman, 2008, pp. 5–6), online forms of cheating also are increasing (Rowe, 2004). In a recent study that specifically examines accounting students, Abdolmo-hammadi and Baker (2007, p. 51) used the www.turnitin.com program and found that 61 percent of accounting students plagiarized a portion of one or more course research papers.

Key components of ethics education in an online environment involve understanding student motivations and the environment in which they operate, as well as helping students understand what is appropriate behavior and the steps they can take to avoid temptation (Molnar et al., 2008, p. 657). However, research shows educators' attempts to intro-duce interventions to reduce cheating using online resources have been successful in some contexts, but not others (Kaner & Fiedler, 2008, p. 184). Therefore, additional ethics education research involving online settings is needed.

This study investigates student integrity in an online setting in an upper-division accounting class. It examines student honesty about accessing unauthorized Internet case solutions, as well as the effectiveness of various interventions designed to discourage unauthorized file access. We employ a number of techniques to encourage ethical development and behavior described by Armstrong, Ketz, and Owsen (2003, pp. 7–9) and Granitz and Loewy (2007, p. 301). However, these did not deter students from accessing unauthorized online materials. Additionally, our examination finds no significant relationship between student ethical behavior and any of the following factors: moral development, moral identity, age, gender, and grade point average.

The remainder of this chapter is organized as follows. First, we review literature related to ethical motivation and behavior in accounting contexts and online environments. Then, we discuss studies that address interven-tions which promote ethical behavior. Next, we detail our study's methodology. We conclude with a summary of our findings and specific suggestions for developing and encouraging ethical behavior among accounting students in learning environments that employ information technology (IT).

LITERATURE REVIEW

Ethical Motivation and Behavior

A number of ethics studies focus on whether individual factors such as age (Turiel, Killen, & Helwig, 1987, p. 255), gender (Crown & Spiller, 1998, p. 683), and grade point average (Leming, 1980, p. 83) are related to ethical behavior. Numerous studies specifically address accounting and business students' ethical motivation and behavior. Armstrong et al. (2003, p. 1) provide a thorough review of the ethics and accounting education literature up to 2002 and frame it in the context of Thorne's (1998) integrated model of ethical decision making. This model posits that virtue and moral development interact and create sensitivity, prescriptive reasoning, ethical motivation and ethical character, which are forerunners of a student's ability to identify ethical dilemmas, ethical judgment, ethical intentions, and ethical behavior (Thorne, 1998, p. 291).

In a study that compares IT ethics to ethics in other contexts, Molnar et al. (2008, p. 659) suggest that ethical decision making in an IT environment is complicated by factors such as computers reducing face-to-face interactions, questions of intellectual property rights, difficulties in protecting information integrity, perceptions that there is no real victim when intellectual property is copied from the Internet, and the lack of effort required to "cut and paste" from the Internet (pp. 659–660). In their study of 708 students at five universities, they find that undergraduate students in general believed that it was more acceptable for them personally to cheat using IT than to cheat without the use of IT. However, the students in their study believed that cheating by others with or without the use of IT was unacceptable.

In two recent accounting ethics studies involving an online component in an academic setting, Abdolmohammadi and Baker (2007, p. 45) and West et al. (2004, p. 173) focus on the relationship between moral reasoning or judgment and unethical behavior. They find that moral reasoning is inversely and significantly correlated with plagiarism. However, West et al. (2004, p. 181) find no significant relationship between moral reasoning and student cheating, or student honesty about cheating.

Moral identity may provide insights into the ethical behavior of students, as well as the mixed findings surrounding moral reasoning. Aquino and Reed describe moral identity as a "self-regulatory mechanism that motivates moral action" (2002, p. 1423). They posit that when moral identity is central

to a person's self-concept, then it provides the motivational strength for the individual to perform or act with moral judgment. Virtue ethics also emphasizes sound moral judgment as a necessary component of enhancing the ability to act in an ethical manner (Dobson & Armstrong, 1995, pp. 189–190). Moral identity complements the concept of moral reasoning as a predictor of moral action.

Armstrong et al. (2003, pp. 11–12) and Granitz and Loewy (2007, p. 301) both suggest actions that instructors can take to promote an ethical classroom environment. Rowe (2004) tailors similar ideas for the online environment. Recommendations to mitigate cheating behavior focus both on proactive teaching innovations, such as honor codes, modeling good professional behavior, and clear boundary specifications, and on reactive or consequential methods, such as enforcement and surveillance.

METHOD

Based on the above-discussed literature, we examine factors such as moral development, moral identity, age, gender, and grade point average in relation to student ethical behavior in a learning environment that employs IT. In determining whether there are significant relationships among moral reasoning, moral identity, and ethical behavior, we measure moral reasoning using the defining issues test (DIT) (Rest, 1979, p. 14, 1986, pp. 176–179) and moral identity using Aquino and Reed's scale (2002, pp. 1423–1425). We also use various intervention methods found in the ethics literature to motivate students to behave ethically and assess the impact of these methods on students confronted with Internet access restrictions.

Subjects

Twenty-eight accounting students (16 females and 12 males) enrolled in a senior-level undergraduate auditing class at a public university participated in each step of the study. The institution is an urban commuter campus where the majority of students are employed while attending school.

In addition to the university's academic integrity instruction requirements, accounting students study the standards of professional conduct, learn an ethical decision-making framework, prepare real-world cases in which accounting professionals behaved unethically with serious consequences (e.g., Enron, WorldCom, and Phar-Mor), and discuss "whistle-

blowing'' instances in which individuals spoke out against fraud. As noted previously, these university requirements are specified in the moral behavior literature as those that forestall unethical behavior (Granitz & Lowey, 2007, p. 302; Armstrong et al., 2003, pp. 11–12; Rowe, 2004). Table 1 summarizes the academic integrity training that accounting students receive at the university.

Table 1. Academic Integrity Interventions Employed at Study University.

Execute honor contract	When students matriculate into the business school, they attend an orientation and individually sign a document that attests to their understanding of the academic integrity code of conduct and consequences of violating the code. The code is reinforced in the syllabi. Students sign honor statements on exams and projects.
Institute clear, severe penalties	The consequences of code violation are specifically articulated in orientation material, class syllabi, and an academic integrity website. The first cheating offense results in a grade of zero on the assignment or exam, while the second offense results in a failing grade for the course.
Adopt zero-tolerance approach and enforce penalties	Faculty receive training on the academic integrity code of conduct, its specific articulation in the syllabi, and the zero-tolerance approach. Cases are reported to Academic Integrity officer and penalties are enforced.
Expose students to ethical theories	Students study ethical theories including an ethical decision-making framework in senior-level accounting courses.
Emphasize negative consequences and usage of both good and bad exemplars	Ethical vignettes are presented and discussed in junior-level courses. Senior-level courses address control and environment failures, ethical violations (e.g., Enron, WorldCom, Phar-Mor), and ''whistle-blowing.''
Use ''paradigmatic'' cases which illustrate ethical principles in accounting such as public interest, independence, integrity, and objectivity	''Paradigmatic'' cases are part of senior-level accounting courses.
Act as role model and promote good professional behavior	The course instructor is a member of university's Academic Integrity Task Force and Ethics Task Force.
Explain and emphasize surveillance	Students are made aware of the statistics-tracking feature of Blackboard.

Design and Procedure

The senior-level auditing course is an opportune place to assess the cumulative impact of the school's academic and professional integrity efforts. We collected data throughout the spring semester. Table 2 outlines the data collection sequence, which is described in more detail in the following sections.

Weeks 1–2
Ethics and professionalism were the initial focus in the auditing course. Students were assigned codes to protect their anonymity and they completed

Table 2. Weekly Data Collection Procedures.

Weeks 1–2	Students completed the defining issues test. Instructors required students to access Blackboard for announcements and class updates. Instructor assigned professional ethics readings, which are discussed in class.
Week 3	Students completed the *Leigh Ann Walker* case. The case had no significant grade impact; it was assigned for class discussion and included questions to guide student preparation.
	When students accessed Blackboard in anticipation of week 3, a document to assist them interpreting their DIT scores was posted. The students received the results of their DIT exercise in week 3. Also present on Blackboard was a posting titled *Case Solutions to the Leigh Ann Walker, Staff Accountant* case with explicit instructions not to access the case solutions
	Students received DIT results together with a debrief.
Weeks 4–10	Students discussed the *Leigh Ann Walker* case. They anonymously reported whether they abided by explicit "non-access" instructions on Blackboard.
	Students completed a test on the ethical decision-making framework and analyzed five class audit cases involving fraud and unethical behavior. Class discussion centered on the role of the accounting professionals in creating an environment in which opportunity for such behavior is limited.
Week 11	Guest instructors administered the Moral Identity Scale to students and collected qualitative data to assess motivations for observed week 3 behaviors.
	Students confronted their actions as part of a classroom discussion reinforcing professional ethical boundaries and were collectively counseled as to the potential consequences.
Weeks 12–13	Students applied the audit process to an entity in a term project. Instructors link the assignment to the *Leigh Ann Walker* case. Specifically, can one trust or rely on the work papers of an individual who had told a "white lie?"
Weeks 14–16	The final two assignments in a five-part term project were due within one week of each other. Solutions to last section of the project were posted on Blackboard with the same explicit access instructions as week 3. This assignment constituted 5.5 percent of course grade.

the DIT to assess their own levels of moral reasoning. Over these two weeks, the students completed readings from the Josephson Institute of Ethics' *Six Pillars of Character* on trustworthiness, respect, responsibility, fairness, caring, and citizenship, and a six-step approach to resolving ethical dilemmas (Arens, Elder, & Beasley, 2006, pp. 74–76). The framework steps are as follows: (1) obtain the relevant facts; (2) identify the ethical issues from the facts; (3) determine who is affected by the outcome of the dilemma and how each person or group is affected; (4) identify the alternatives available to the person who must resolve the dilemma; (5) identify the likely conse-quences of each alternative; and (6) decide the appropriate course of action.

Week 3

The instructor next assigned a case titled, *Leigh Ann Walker, Staff Accountant* (Knapp, 2006, pp. 331–332). While no points were specifically assigned to the case itself, the instructor did reward student class participation throughout the semester. This case describes the true story of a young lady who upon graduation begins work in a large public accounting firm. Several weeks into her first audit engagement, the senior-in-charge asks her whether she had yet taken the CPA exam. Although she had taken the exam, she lied to her supervisor because she thought she might have failed the exam, and hoped to avoid potential embarrassment. Upon learning that she did pass, the young woman informs several individuals at the firm, including the senior. The senior, troubled by the young lady's lack of integrity, reports the situation to firm management. As a result, the recently hired young lady is let go by the firm since trustworthiness is a trait critical to her profession. The case provides the basis for an important class discussion since professional integrity is called into question over what some may view as a minor indiscretion.

Our university uses Blackboard Academic Suite™ as its course manage-ment platform. Students understood that they should regularly check the course site for important information. Prior to this class session, the instructor posted an announcement asking students to download a document from the course site to use in an upcoming class. The instructor also placed solutions to the *Leigh Ann Walker, Staff Accountant* case on the same section of Blackboard. Explicit instructions next to these files, in bold, italicized capital letters, stated that the students should not access the case solutions prior to classroom discussion. The intent was to simulate the type of warning professional accountants encounter in their normal workflow. The instructor applied the statistical tracking feature of Blackboard to assess whether and how frequently students accessed the unauthorized

materials. The instructor then removed the solutions from Blackboard just prior to the start of the actual class session.

At the beginning of the week 3 class, the instructor asked students to write their assigned codes on a sheet of paper and to indicate whether or not they had opened the case solution file. The instructor then explained how the posting episode paralleled the *Leigh Ann Walker* case and highlighted the lesson that a "white lie" is a violation of personal integrity and professionalism. The instructor assumed that the students would recognize the analogy to the case, the earlier readings, and discussions, and would abide by the *do not access* instructions. Ex ante, the instructor intended to use the exercise to illustrate the students' growth in professional integrity. However, the tracking data revealed that almost every student had accessed the solutions. All but one student who had opened the files lied about it. This unexpected behavior motivated additional interventions and data collection as described in the following sections.

Weeks 4–10

During these weeks, students completed a quiz on professional ethics, as well as an exam question asking them to analyze an ethical dilemma using the six-step ethical decision-making framework taught in weeks 1–3 (Arens et al., 2006, p. 76). Students also analyzed five cases involving fraud and unethical behavior in publicly traded companies. The overarching theme in class discussions during this six-week period was the need for students to create an ethical working environment when they graduated and entered the accounting profession. An individual from public accounting also assisted students in identifying risk areas surrounding management integrity in their assigned term project.

Week 11

A guest instructor conducted a training session to reinforce the importance of honest behavior even when a violation appears small or inconsequential. The guest instructor administered the moral identity scale and collected qualitative data on student rationales and motivations for the week 3 "white lie" behaviors, as well as influences on their ethical behavior and perspectives on future behavior. Three faculty members reviewed and coded the written responses.

Weeks 12–13

Students applied audit class concepts to an entity in their term project, including work paper preparation. Again, the *Leigh Ann Walker* case was

discussed and students were asked if they could trust that someone actually did the work described in the workpapers if that individual had previously told them a "white lie."

Weeks 14–16

The final two assignments of a five-part term project were due within one week of each other during this period. After students turned in part 4 (week 14), the instructor informed them that the solution to part 4 was available on Blackboard, along with a study guide for the week 16 final exam. As in the previous restricted-access trial (week 3), the instructor also posted the solution to part 5 of the term project next to the part 4 solution and the final exam study guide. Again, the instructor placed explicit instructions in bold and all capital letters to not open the file until the student had turned in part 5 of the assignment during week 15. In contrast to the first access trial, which contained material with no points assigned, part 5 of the term project comprised 5.5 percent of the student's final grade. The instructor again applied statistical tracking to determine whether the restricted information was accessed.

RESULTS

Table 3 reveals that for the restricted-access trial during week 3, 25 of the 28 students who visited the class web site to obtain the assigned document also accessed the *Leigh Ann Walker* case solution. Additionally, 24 of 25 students lied about accessing the case solution.

During the week 11 intervention, the guest instructor reported the statistics on the unauthorized file access in week 3. Students were shocked to learn that almost all of the class had looked at the case solutions. Their

Table 3. Students Engaged in Unethical Behavior.

Sample	Female	Male
Total class enrollment	16	12
Number of students who opened the *Leigh Ann Walker* case without authorization (week 3 intervention)	13	12
Number of students who lied about opening *Leigh Ann Walker* (week 3 intervention)	12	12
Number of students who opened final case without authorization (week 14 intervention)	14	12

reactions varied from anger at other students to embarrassment that the instructor might think poorly of them as a class. The instructor emphasized that accessing the unauthorized materials represented poor decision making rather than flawed character, and explained that this exercise was preparing them for similar experiences in their future professional careers. Student curiosity and conversation was lively and there was no indication of hostility towards the intervention.

Students then were asked why they would access the unauthorized files and lie about it. The instructor framed this question in the third person to avoid embarrassment. Some students indicated that they had not read the instructions or had prepared the case answers in advance and did not view checking their answers as a transgression. Other explanations included the pressure of internships, family problems, or class workloads that promoted them to take shortcuts. A final behavior justification was that obtaining the case answers in advance of the class discussion provided a means to impress peers and faculty. When questioned as to why one would further lie about accessing the electronic materials, some students volunteered that they did not want to tarnish their image and disappoint the class instructor.

In week 11, students also submitted written responses to a question about their personal ethical influences. Their responses indicated four main categories of influence: people (family, friends, co-workers, and employers), beliefs (philosophy, religion), life experiences, and school. In response as to how they will identify an ethical crossroad in the future, they indicated that they would rely on instincts (i.e., doing what feels right) and follow a structured decision process.

For the week 14 restricted-access trial, 26 of 28 students accessed part 5 of the final case solution prior to being authorized to do so. All three students who did not access the *Leigh Ann Walker* case solution in the week 3 trial did access the final solution without authorization in week 14.

Originally, the authors planned on employing logistic regression to analyze the data. However, our independent variables (DIT and moral identity scores as well as age, gender and grade point average) cannot say anything about a student's probability to access the final solution without authorization because too few students did not access the final solution.

DISCUSSION

The results of this study confirm Molnar et al.'s (2008, p. 657) findings that a high percentage of students find it acceptable to cheat using IT. Almost all

of the students in this study not only accessed unauthorized solutions on the Internet but also lied about accessing those materials. Despite theories such as Thorne's integrated model of ethical decision making (1998, p. 291) and Kohlberg's (1981, p. 136) cognitive moral development theory, students' levels of moral reasoning and moral identity were unrelated to ethical decisions or moral behavior. Age, gender, and grade point average also were unrelated to students' ethical behavior in this study.

Some of the factors found significant in Banerjee, Cronan, and Jones's (1998, p. 46) model of IT ethics may explain the behavior observed in our study. They found ethical behavior to be situation specific and that moral judgment and attitude towards the behavior did not explain intentions to behave in an ethical manner. In addition, their research shows that personal normative beliefs about performing an act and an organization's ethical environment influence ethical intentions. In our study, despite all the steps the university, accounting program, and the individual instructor took to develop and encourage ethical behavior, the context of the solutions being posted online and subsequent knowledge that other students were accessing the unauthorized materials may have influenced our students to engage in unethical behavior.

The students in our study also may be similar to those in Kaufmann, West, Ravenscroft, and Shrader's (2005, p. 126), who were described as exhibiting a complete lack of moral imagination and who ethically distanced themselves from their actions and the effect of those actions on others. They suggest that their students "did not even see the issue of cheating as a moral one" (p. 126). Kaufmann et al. (2005, p. 130) posit that "actors engage in wrongful behavior not just because factors discouraging such behavior are ineffective but because they actively seek to justify it." Similarly, our student subjects did not view accessing the online material as a transgression, and believed that their personal situation (work load and family pressures) made it acceptable.

Zack (1998) noted that it takes little pressure for students to succumb to retrieving electronic information online. Thus, online environments may serve to exacerbate a culture of cheating (Callahan, 2004, pp. 12–13). Similar to Bunn, Caudill, & Gropper's (1992, p. 204) and McCabe et al.'s (2006, pp. 299–300) observations, the perception of their peers' cheating may have had the greatest effect on our students engaging in academic dishonesty.

Throughout this chapter we have illustrated and discussed cheating behaviors. Callahan (2004) refers to the events we witnessed as the culture of cheating. Palfrey and Gasser (2008) present a provocative thesis that

challenges us to view students born since 1980 as "digital natives" versus those born prior to 1980, who the authors call "digital immigrants." Digital natives are a new demographic culture. In an online author interview, Palfrey (2009) proposes that digital natives do not distinguish between their online and offline lives. Rather it is one fluid medium in which they communicate with peers, information and institutions. Digital natives have grown up with ready access to free information. Their views of property rights are in contrast to digital immigrants, not to mention property rights law. If we are faced with a new demographic culture that has long-term implications, our responses and teaching methods may need to change. Palfrey (2009) suggests that we need to either (1) change minds about what constitutes proper behavior, (2) change the business model, which in a classroom setting would require changing the incentives for unauthorized access as well as lowering the tolerance for sleeping watchdogs, or (3) change the laws, which might mean more stringent penalties for improper behaviors. What Palfrey and Gasser (2008) provide is a view of students who are not all dishonest cheaters, but honest people raised in a different culture. Their work provides a positive framework upon which we can begin to shape our students into responsible professionals.

CONCLUSIONS AND RECOMMENDATIONS

This study makes several contributions to the literature. First, we measure actual student ethical behavior rather than self-reported ethical behavior. Bernardi and Adamitis (2007, p. 149) find that self-reported cheating behavior is often underreported due to students' concerns about providing a socially and personally desirable response. Second, our results demonstrate that many of the traditional intervention methods found in the ethics literature may not motivate students to behave ethically in an IT environment. As Granitz and Loewy (2007, p. 293) point out, the approach that resonates and motivates ethical action varies from student to student. In the online setting of this study, techniques such as honor codes, syllabus reinforcement and guidance, and repeated classroom discussions were not sufficient to move students from the theoretical to the practical perspective. However, if the intent is to transform accounting students into accounting professionals, we need to find teaching methods that build the integrity muscle, particularly in the face of increasing online environments, so that students respond with integrity in the presence and absence of enforced penalties. We provide suggestions below that include approaches not used

nor emphasized sufficiently by our university's and instructor's approach to fostering ethical decision making.

Guiding Ideas

Develop Schemas

Professional integrity choices are often a "pop quiz." They are incidents in which students and professionals are faced with opportunities or pressures to act with integrity that arise without advance notice. Therefore, it is necessary for individuals to develop schemas or antennae that alert them to be careful about their choices and possible consequences. Mary Gentile (2007), in her *Giving Voice to Values* curriculum, calls this "developing the integrity muscle" (www.givingvoicetovalues.org). The challenge accounting faculty face is how to teach integrity and ethics so that students internalize the message and practice it in a variety of settings. Similar to the experiment by Dirsmith and Ketz (1987, p. 140), the students in our study became energized to discuss integrity issues when they were placed in an immediate, real, and relevant setting.

Cultivate Virtue

Armstrong et al. (2003, p. 9) suggest that exemplars and exhortation may encourage more ethical behavior. They note that "it is insufficient to eliminate vice, and so one must also cultivate virtue" and suggest emphasizing cases and individuals who made ethical choices. While numerous case examples of unacceptable accountant behavior are presented, there are fewer case examples of accounting professionals behaving in an honorable fashion. Knapp, Louwers, and Weber (1998, p. 270) suggest that accounting heroes should be celebrated as a means of encouraging ethical behavior in students.

Comprehensive Approach

Armstrong et al. (2003, p. 5) also advocate a three-tiered "sandwich" approach comprised of the following:

- General course in ethics, followed by
- A variety of accounting courses in which case studies and homework problems help students spot ethical issues and reinforce good ethical reasoning, and
- A Capstone course in ethics and professionalism taught by accounting faculty.

Introducing self-reflection exercises at the beginning and end of accounting courses may help students develop more awareness of their ethical identity (Esmond-Kiger & Stein, 1998, pp. 218–219). Such exercises might require students first to write an essay about their ethical responsibilities, and then discuss whether they lived up to their own expectations. Moral imagining (Kaufmann et al., 2005, p. 126) also might help instructors guide students to opportunities that build greater self-awareness of the impact of one's actions on others.

Countermeasures for Online Instruction

Molnar et al. (2008, p. 667) recommend that ethics instruction specifically geared towards IT environments is needed. A code of ethics related to online behavior should be established and enforced. Rowe (2004) also provides suggestions such as clearly defining cheating in online environments, being vigilant with security (e.g., intrusion-detection software, hard-to-guess passwords), using varied test formats, and using plagiarism safeguards.

Hence, as education increasingly incorporates IT and the culture of cheating becomes more pervasive, accounting educators must develop comprehensive strategies to assist students in developing strong ethics. These strategies should include defining acceptable and unacceptable classroom behavior, providing examples of honorable conduct, developing schema and images of ethical behavior, providing structures for ethical decision making, and enforcing rules prohibiting all forms of cheating. Only when a multifaceted approach is adopted are the students likely to develop the high levels of ethical behavior needed in the accounting profession and society.

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