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Automated Accounting: Are Computers Being Used in Accounting I?

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AUTOMATED ACCOUNTING: ARE COMPUTERS BEING

USED IN ACCOUNTING I?

(TITLE)

BY

JANET G. JOHNSON

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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Abstract

Continuous improvement in the accounting curriculum is needed to prepare students for the technology-based workplace of today's business world. Literature available indicated that using computers in the accounting curriculum, is one essential tool available to students. This study examined the professional opinions and teaching practices of community college and secondary educators in Illinois. A survey was used as the research instrument. There were 148 participants in the study. The purpose of the study was to determine if computers were being used by accounting instructors in Accounting I and when they felt computers should be integrated into their accounting curricula. The findings of this research indicated that accounting instructors believe that computers are an important part of today's accounting curriculum. It also indicated that 81.1% of accounting instructors are using computers to enhance their accounting curricula. Most instructors (76.3%) believe that computers should be used during the first year of accounting. However, there was a significant difference between the opinions of secondary and community college instructors.

ACKNOWLEDGMENTS

It is with the highest recognition that I express my gratitude to the following individuals for the help and support given during the progress of writing this paper.

To Mr. Doug Bower, who assisted with the analysis of the statistical information.

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Last, but certainly not least, to my family, who has encouraged me to complete this paper and allowed me the time and space to accomplish this fulfilling achievement.

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Chapter 1

Introduction

Nature of the Problem

Accounting education has been a topic of review for the past ten years. The Accounting Education Change Commission (AECC) was created in 1989 to provide leadership in changing accounting education to better prepare students for careers in public practice. The objectives of the AECC were to examine and discuss issues related to preparing future accountants, to bring about improvements such as restructuring the curriculum, to award and oversee grants to schools to help achieve these objectives, to respond to the concerns of the public, and to report their findings to the American Accounting Association (AAA). ("AAA Establishes Accounting Education Change Commission," 1989).

Since that time, many researchers have examined various areas of study in the accounting field. "As technology continues to impact and enhance the accounting process, the knowledge, skills, and experiences needed by accounting students is being assessed" (Hoyt, 1997, p. 101). He reported that technology has enabled instructors many opportunities to integrate activities and applications never before possible. Hoyt believed technology should be viewed as a vital tool that teachers may use to enhance the core accounting curriculum. He further stated that because of this, students are no longer just processors of financial data, they must now also have the ability to analyze and interpret the financial information available to them.

With the explosion of technology in our economy, the need to teach computer skills in business is extremely important. After his examination of employment ads, Wasson (1992) stated that office and accounting positions require experience with spreadsheet, database, and data-entry in addition to typical word processing and accounting skills.

Graham (1993) stated that instructors need to prepare students for entry level accounting positions by including computers in their curricula. He believed that computers should be used earlier and more often. Businesses that employ high school graduates are now using computers for their record-keeping. Therefore, it is imperative that computer education be included in the high school curriculum (Spiegelberg, 1993). Segui (1991) suggested using the same software used in the business world. He believed that because computers are in every aspect of our lives, it is imperative that educators provide students with skills needed to be competitive in the workplace. Ames (1991) stressed that computer-literacy skills are crucial in preparing students for successful careers. These skills are most needed in the technology-oriented employment market.

Preparing students for the work world should be of major concern to teachers and including computers in their instruction is part of this preparation. Hoyt (1993) said, "Accounting should be an interesting, challenging, enjoyable, and rewarding experience for all students" (p. 39). He stated that integrating computer applications into accounting programs can be a way of meeting this challenge. He also believed that by incorporating the "what if" situations of the

business world into the accounting curriculum, critical thinking skills of students can be enhanced. According to Borthick and Clark (1996), using computers can be a distinct teaching technique; however, the effectiveness of microcomputer use may not be as dramatic as one would have expected. The study completed by Jensen and Sandin (1992) indicated that computer-aided learning (CAL) is indicative but not conclusive about the value of CAL in motivating and teaching students. Therefore, teachers must be sure that the techniques used are in the best interest of the student.

Professors at Brigham Young University developed an accounting core in which computers were integrated into the curriculum. They concluded that, by using the computer to enhance accounting concepts, students learned these concepts better (Cherrington, Denna, & Romney, 1995). A study by Williams (1993) found that a few colleges have developed computer programs to teach introductory accounting to students.

Togo & McNamee (1995) found both benefits and problems with computer use in accounting education. They suggested that before using computers, teachers should answer affirmatively to questions concerning enhanced learning, time conflicts, and improved students' scores. Their conclusion was that there is an increasing awareness of problems associated with computer use in the accounting classroom. According to Hansen (1992), computer tutorials that follow the simple-to-complex learning found in the first-

year accounting textbooks provide additional drill and practice to enhance the learning of students and these may provide learning for students of all levels.

Statement of Problem

Several authors recommended including computers in the instruction of accounting. Most of the literature dealt with university accounting programs. However, limited articles dealing with high school accounting stressed the importance of computer usage in accounting. Hoyt (1997) recommended that the degree to which computers are used should be determined by the instructors and their departments. However, insufficient information dealing with the use of computers in the beginning accounting course exists. Accounting instructors are concerned that the students may not master basic accounting concepts if computers are introduced too early in the accounting curriculum. The problem is that there is not sufficient research to tell instructors when computers should be introduced in the high school Accounting I curriculum. Are accounting instructors using computers in their beginning accounting classes? If they are not, what are the reasons computers are not being integrated into the accounting curriculum? When do community college and secondary educators feel computers should be introduced? Should the first cycle be completed before computer integration? Should students begin using the computer immediately for data-entry? Should the student complete a full-year of accounting, then begin using the computer in the advanced accounting courses? Finding the answers to these and other questions concerning the use of the computer in the accounting classroom will

help accounting teachers improve the preparation of students for the future. With the onset of the Tech-Prep programs, there is a greater need to articulate the high school accounting curriculum with the community college accounting curriculum. Therefore, it is important to determine the degree of agreement between secondary and community college instructors. Do these two groups of instructors concur about the use of computers in the accounting curriculum?

Purpose of the Study

The increased use of computers in the business world has definitely established the need for educators to review the accounting curriculum and make changes needed to better prepare students for the workplace. The purpose of this research was to find out when accounting instructors feel computers should be introduced into the accounting curriculum and if computers are actually being used in beginning accounting. Are accounting teachers using the information available to them to update their methods? With the results of this research, accounting educators may be better able to decide how to improve their accounting curricula.

Delimitations and Limitations

This study is concerned with the use of computers in only community colleges and high schools in the state of Illinois.

It was not the intent of this study to examine the extent of computer usage in any accounting class other than Accounting I.

The only curriculum issue addressed in this study was the use of computers in Accounting I.

The term "beginning accounting" was not defined in the survey instrument. While most instructors indicated the level of accounting course they were teaching some problems may exist in evaluating the results.

The survey was mailed to the accounting department chair and not all accounting teachers answered the surveyed.

All secondary instructors chosen were selected from the 1994-95 Illinois high school directory.

The survey was mailed to all community colleges in the state and a random sample of the high schools.

Definition of Terms

To provide additional clarity and understanding, the following definition is included:

Automated Accounting - The use of computers in the accounting classroom for instruction and/or accounting applications.

Chapter 2

Review of Related Literature

Introduction

Articles from business journals were examined. The literature dealt with the accounting curriculum being used in colleges and high schools and with the teaching methods of these colleges and high schools.

Accounting Curriculum

In researching the college curriculum, Borthick and Clark (1996) studied managerial and cost accounting. This study showed that students believed the use of computers in accounting courses is necessary and that students experienced greater learning with integrative course assignments than with repetitive non-integrative assignments. The authors stated, "The growth in microcomputer use in accounting education reflects the perceived need of accounting graduates" (p. 143).

With the integration of computer technology into accounting education, the need to examine the use of computers in the accounting classroom increases. However, the effort to learn computer software along with learning accounting requires great effort by the students. ". . . microcomputer use is a positive pedagogical technique. The effectiveness of microcomputer use, however, may not be as dramatic as one would have expected" (Bothrick and Clark, 1996, p 156).

Williams (1993), reported the work of the AECC, is causing changes in accounting education. He indicated that part of these changes resulted from the invasion of technology to all areas of an accountant's professional life. Williams noted that nine colleges and universities have received AECC curriculum development grants. Among these are Arizona State University, Brigham Young University, and Mesa Community College. He stated that one feature of the new accounting curriculum encouraged by the AECC will be the integration of the latest technology throughout the accounting curriculum. Williams reported that "Arizona State University and Mesa Community College are using self-developed computer systems to teach introductory accounting students the rudiments of the accounting cycle in a laboratory setting, freeing up class time for broader and more conceptual issues" (p. 81).

Heagy & Gallun (1994) agreed with Williams, but stated that, ". . . little or no information is available as to the actual computer knowledge considered necessary or desirable of the accounting graduate" (p. 205). Their research showed that greater emphasis should be on spreadsheets first, then accounting systems.

Research at Brigham Young University by Cherrington, Denna, & Romney (1995) showed that accounting should include the use of information systems because of the growing use of computers in business. BYU developed an accounting core in which computers were integrated into the first-year accounting

curriculum. Cherrington, Denna, & Romney concluded that the use of computers enhanced the student's ability to learn accounting concepts.

The increased use of computers and information systems in the corporate world has caused The American University's Kogod College of Business Administration to attempt to integrate information technology into its curriculum. After completing an assessment of the university's curriculum, Delone & Biles (1991) found the main obstacles to integration were: continued pressure on the teacher, lack of computer literacy, lack of faculty incentives, lack of faculty involvement in curriculum modification, coordination across departments and space limitations. They stated that many ingredients were important for successful integration. By recommending an internal assessment of organizational realities, clear articulation of integration objectives with specific action items, faculty incentives and communication among internal and external colleagues, the integration objective is within reach.

The study by Rebele, Stout, & Hassell (1991) examined the research done between the years 1985 and 1991. A study by Guinn (as cited in Rebele, Stout, & Hassell, 1991) indicated that approximately one-half of those responding to the study were using microcomputers in the first auditing course, and the number was usually higher in accredited accounting programs (p. 187). Kocakulah and Wade's study (as cited in Rebele, Stout, & Hassell, 1991) stated that about 75% of the

respondents were using computers in cost accounting courses (p. 187). The authors' research also showed that most studies done were related to the accounting faculty concerns. Rebele, Stout, & Hassell recommended future studies on improving the quality of accounting education.

Since computers are in every aspect of our lives today, Segui (1991) said it is imperative that educators provide students with skills needed to be competitive in the workplace. They must provide hands-on experiences using the computer in the classroom. He suggested using the same software that is being used in the business world.

Buttermilch (1991) reported that computer applications in accounting will be essential for the future of accounting professionals. Integrating the computer better prepares students for the technology environment they will find in the workplace. She suggested requiring a computer class as a prerequisite, or corequisite, to Accounting I to better prepare students.

Graham (1993) further advocated the use of computers in accounting by stating, "Teachers who are preparing students for entry level accounting positions must be sure that students are familiar with microcomputer technology" (p. 30). His research showed that employers want students with a working knowledge of word processing and database as well as spreadsheet programs. His findings concluded that, ". . . greater and earlier emphasis should be placed on the use of the computer" (p. 31). Using computer applications at key points

throughout Accounting I will be more beneficial to students. Graham believed less time should be spent on manually solving repetitious problems.

Another advocate of using computers in the accounting classroom and preparing students for the work world, stated:

> Accounting is a natural subject for the incorporation of computer applications . . . . The computer can become your gateway to move the student from the textbook into the real world . . . . It is a strategy that makes education relevant and meaningful. (Hogan, 1994, p. 37)

Teaching Methods

A study by Togo & McNamee (1995) gave a list of benefits and problems of computer use in accounting education. They emphasized that computer integration would not just change the accounting course but should improve it. Time constraints seemed to be the greatest problem with computer integration. Requiring students to have computer skills before taking accounting could reduce this problem. They found that students attempted to complete the computer assignments before completely understanding the basic accounting principles. Togo & McNamee suggested computer software be used only after students have learned the accounting concepts needed for a computer assignment. They advised answering three questions with an affirmative answer, before using computers. "Will the computer assignment enhance learning of the accounting concepts" (p. 155)? They reported that such computer projects increase learning and student appreciation. "Will the

computer assignment create time conflicts that would adversely affect student learning of the accounting concepts" (p. 156)? Togo and McNamee suggested that the time needed to learn a software language could be a major drawback to integrating computers into the accounting curriculum. "Will the students successfully completing the computer assignment also improve their grade in the course" (p. 156)? They believed better student grades should be the ultimate goal. Togo & McNamee concluded that there is an increasing awareness of problems associated with computer use in the accounting classroom.

Articles relating to high school instruction report conflicting results compared to college and university research. Hoyt (1993) believed that students should enjoy their accounting classes. Teachers of accounting are meeting this challenge by integrating computer applications in their accounting programs. He stated that by using computer applications students can use critical thinking for the "what if" situations found in the business world. Hoyt indicated that these skills are needed in today's technology-oriented employment market.

Hansen (1992) studied the use of computer tutorials and concluded that computer tutorials furnish supplementary practice that strengthens student learning. He also reported that these types of programs follow the order of learning found in Accounting I textbooks. Hansen believed students of all ability levels benefit from these tutorial applications.

In another study of computer tutorials, Getter & Gilbertson (1992) found that tutorials allow students to work at their own pace for reinforcement of a

specific skill. They implied that because of this capability, computers allow activities that are appropriate for individual ability levels.

Wasson's (1992) examination of employment ads stressed that a new approach to teaching accounting is necessary.

> Positions listed as office positions require experience with spreadsheet and database applications and accounting and data entry ability in addition to the traditional typewriting and word processing skills. Positions listed as accounting positions require word processing and data-entry ability in addition to the traditional accounting background. (p. 33)

He believed that using computers to enter the chart of accounts early in the first semester is a good way of integrating computers in the accounting curriculum. After the introduction of each new concept, entering data is a continuation of integration. Wasson recommended that curriculum changes need to expand the use of computers covering accounting concepts and procedures. He also stated that by using the computers as a drawing-card, perhaps more students will enroll in the beginning accounting class.

Borgmeier, Creveling & Bartholome (1989) believed that one of the objectives in secondary accounting textbooks is that students should explore technology in performing business tasks. They stated that students should be using the computer in accounting education, but recommended the introduction of basic skills or concepts should precede computer usage. Using the computer in accounting classes provides a realistic accounting experience for students.

Nevertheless, the researchers suggested that students understand the procedures that the computer automatically performs. Borgmeier, Creveling & Bartholome stated that one-third of the teachers surveyed wait until the second year to introduce the computer, about one-half introduce the computer during the first year with the greatest emphasis during the second year and one-fourth use the computer extensively during the last period of the first year. The authors recommended that computers be integrated to better prepare students for the technology found in the work environment.

The purpose of Jackson's (1993) study was to determine the perception of business educators regarding when to begin teaching computerized accounting in high school. A survey of nine business teachers attending Northwest Missouri State University revealed they all agreed to the policy of introducing basic accounting principles before using computers in secondary accounting classes.

Moses (1990) reported that teachers are skeptical about using computers even though business places great emphasis on using computers. He stated that they question whether students understand the accounting concepts, specifically posting. Computers do this automatically and students may not grasp this principle. Even though some research shows that the computer may be a motivating factor for students, Moses felt there was a need for further research.

Research by Moses & Echternacht (1991) compared the differences in achievement, class perception and completion time between students

completing manual accounting simulations and those completing automated accounting simulations. The results of this study indicated that there was no significant difference in student achievement or perception of the class between the two groups. The authors also revealed that ". . . students used approximately 14 hours to complete the manual simulation as compared with approximately 7.6 hours to complete the automated simulation" (p. 47). This study indicated a significant difference between the two groups in completion times of the simulations. Moses & Echternacht stated that because of this difference, computers should be integrated into the accounting curriculum.

Fundamental accounting principles and concepts are not being abandoned with the integration of computerized accounting programs (Hoyt, 1996). He stated, "However, students must master the principles and concepts in accounting and must experience the manual preparation of documents before automated procedures are integrated" (p. 31). Hoyt believed the advanced accounting class should use computers more extensively, after students have a solid understanding of accounting principles.

The purpose of accounting instruction should be to prepare our students for a successful career (Ames, 1991). Therefore, he listed teaching computer-literacy skills as crucial for accounting teachers to be successful.

According to Spiegelberg (1993), businesses that employ our high school graduates are now using computers for their recordkeeping. She indicated that it is imperative that we include computer education in the secondary curriculum.

"At the secondary level, whether or not two years of accounting are offered, the microcomputer should be integrated into the first-year course" (p. 39). Spiegelberg suggested using tutorials to reinforce basic accounting principles. She believed teachers should use both computer and manual activities. Also, she believed in the utilization of computers throughout the year to reinforce skills and not only at the end of the year.

Whitney (1992) stated:

> The accounting system of debits and credits is the father of the computer system of today. This revered old system is dear to the hearts of the old-line accounting teachers and hard to give up. Sentimentality, however, has little place in the advanced technical society of today . . . . We owe our students an accounting program for today! (p. 27-28)

Hellmuth (1991) discussed the advantages students with high school accounting have over other college accounting students. Although the focus of the study was on the similarities and differences of high school and college textbooks, she mentioned accounting courses that teach computer skills as one of the benefits. She stated that these courses introduce students to computerized recordkeeping and automated data processing. These are skills that will be needed in college accounting.

Research by Jensen & Sandin (1992) is indicative, but not conclusive, as to the value of computer aided learning (CAL) in motivating and teaching students. The results of this study included advantages like the ability to provide

remedial lessons, adapting to changing technology and being able to keep the attention of students who have grown up with television, electronic games, etc., as positive reasons to use CAL. However, the results also included disadvantages of CAL such as instructors being more interested in computers than in what the computer can do for instruction, being careful to evaluate the effectiveness of CAL for the student, and realizing the importance of varying teaching methods.

As reported by Ross & Swinehart (1994), a study of the Hillsborogh Community College in Tampa, Florida revealed a dramatic dropout rate during the first semester of accounting. They stated that revisions in the community college and high school curricula were needed for successful articulation. "Tech Prep requires that education be on the cutting edge of the technical and foundation skills necessary for business and industry" (p. 39). The authors reported that the curriculum committee appointed to examine the situation recommended textbooks and materials providing a smooth transition from the high school computerized accounting class to the college program.

The James Kulik study (as cited in Molinar, 1997) stated that scores increased from 10 to 20 percentile in computer-based education. Kulik also found that the time required to complete tasks was reduced by one-third. ". . ., this study did answer the question, do computer-based technologies work? They most certainly do" (p. 65). However, according to Spiegelberg (1992), budget

difficulties may be one reason that instructors are not using computers in accounting classes. The price of hardware and software necessary to integrate computers into accounting education is beyond the financial limits of some schools.

Chapter 3

Methods and Procedures

Background

A review of the research available on the use of computers in the accounting class revealed the need for further study. This research emphasized the need for computer use in the accounting classroom but did not address the existence of, or the extent of, computer use in the classroom. Since businesses are using the computer extensively in their work, it seemed important to examine the classroom instruction that should prepare students for the world of work.

Survey Instrument

After review of the literature, a survey instrument was developed. A pilot test was conducted. Eleven secondary teachers, and four community college teachers reviewed the instrument. The pilot test was used to refine the survey instrument. The final survey instrument, "Computer Use In the Accounting Class" (Appendix A), was then mailed to the selected recipients who were asked to return it within three weeks.

Population and Sample

The population consisted of two groups, secondary and community college accounting department chairs. The population of the high school came from the 1994-1995 Directory of Illinois High Schools and the population of the community colleges came from the 1996-97 IBEA Community College Directory. The sample included all 50 of the community colleges in Illinois and a random

sample of the high school population. Using the "Table for Selecting Sample Size" (Wunsch, 1986) a sample size of 235 was selected to ensure the results were within 5% of the true population value. A database of the high schools was made from the directory in the order given, which was by county. Each school was assigned a number according to the order listed in the directory. A computer generated random number list was used to choose the sample of high schools used in this study. This sample (235 high schools) and 50 community colleges made up the total (285) surveys mailed.

Data Collection Procedures

Surveys were mailed to the accounting department chair of each school selected for the research. The survey included a cover letter (Appendix B) and a stamped, self-addressed, return envelope. The directions for the survey asked the department chairs, if they were not teaching accounting at the present time, to give the survey to an accounting instructor. At the time of the mailing the database files were marked with the date the survey was mailed. When responses were received, the file was marked. The file of respondents wanting the results of the survey were marked with an asterisk. The total number of surveys returned was 148 (51.93%). Of these, 127 (54.04%) were high school surveys and 21 (42%) were community college surveys. A follow-up mailing was deemed unnecessary.

Data Analysis

The results were recorded in a spreadsheet file and analyzed by SPSS Base 7.0 for Windows. The statistical data analyses used for this study were t-test analysis for independent groups at the .05 significance level.

Chapter 4

Reporting the Findings

The results of the study are presented as follows: (a) the frequency distribution of answers given to the first seven questions of the survey (see Appendix A), (b) results of instructors' opinions about when computers should begin to be used in accounting, (c) summary of instructors' feelings about computer use in the accounting classroom, and (d) the t-test results.

Figures 1 through 7 show the results of questions concerning accounting instructors' background and school facilities available to accounting instructors. There were 148 (51.93% of mailed surveys) participants in the survey.

The professional information and background of the participants are shown in Figures 1 through 3.

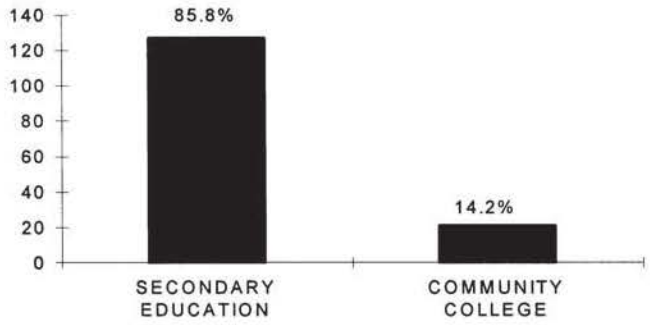

Figure 1. Type of school in which instructors are currently teaching

Of the 148 participants in the study, 21 (14.2%) were community college instructors and 127 (85.8%) were secondary instructors.

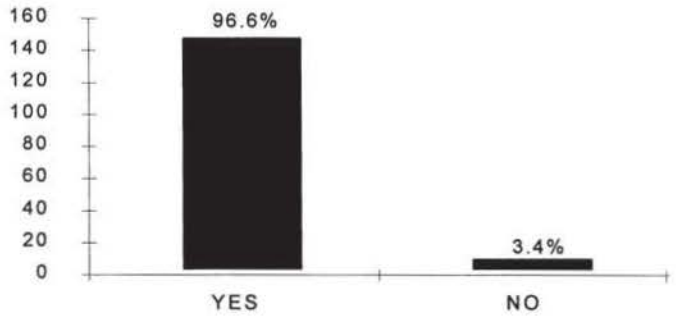

Figure 2. Instructors currently teaching accounting.

There were 143 instructors (96.6%) that were currently teaching accounting. Five instructors (3.4%) were not currently teaching accounting.

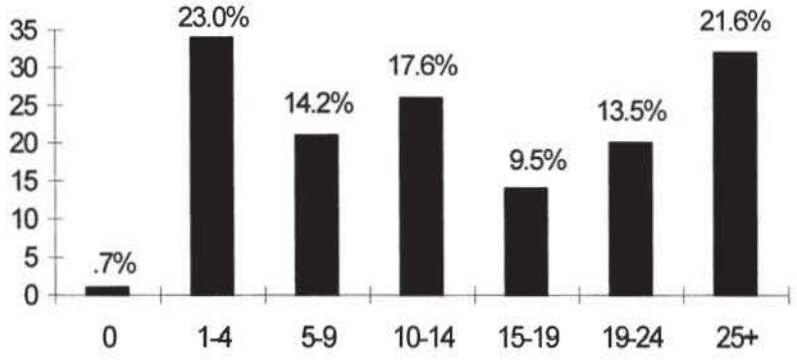

Figure 3. The number of years instructors have been teaching accounting.

The teaching experience of the participants of the survey was somewhat evenly distributed. Of the participants, 1 (0.7%) had not taught accounting, 34 (23.0%) had taught accounting 1 to 4 years, 21 (14.2%) had taught accounting 5 to 9 years, 26 (17.6%) had taught accounting 10-14 years, 14 (9.5%) had taught accounting 15 to 19 years, 20 (13.5%) had taught accounting 20 to 24 years and

32 (21.6%) had taught accounting over 25 years. For the purpose of this study these were divided into two groups to determine if instructors with experience had differences. Sixty-six of the instructors (44.6%) had taught accounting 0 to 14 years and 82 of the instructors (55.4%) had taught accounting 15 years or more.

Figures 4 - 7 show the actual number of instructors who incorporate computers in their accounting curricula. Of those surveyed, 81.1% had used computers in their curricula. Many (42.6%) had computers available in the accounting classroom and of those 33.8% had one computer for each student.

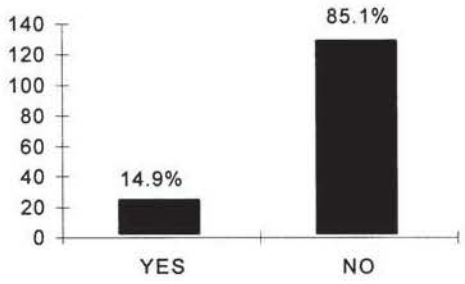

Figure 4. Instructors who teach a separate automated accounting class.

Of the instructors surveyed 22 (14.9%) were teaching a separate automated accounting class and 126 (85.1%) were not teaching a separate accounting class.

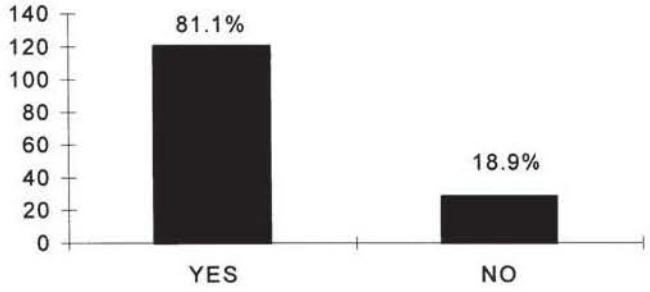

Figure 5. Instructors who incorporate computers into their accounting curricula.

There were 120 instructors (81.1%) who incorporated computers into their accounting classes. Twenty-eight (18.9%) of the instructors did not use computers in their accounting classes.

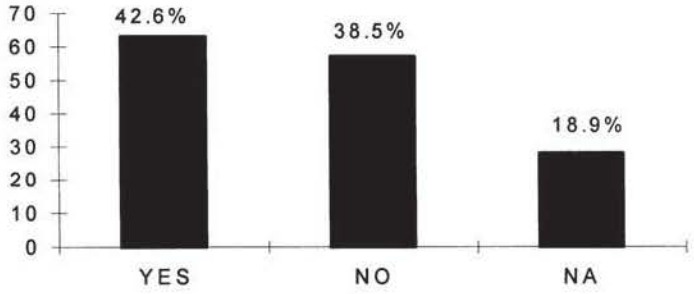

Figure 6. Accounting instructors who have computers in their classrooms.

Twenty-eight of the instructors (18.9%) did not answer this question on the survey. Sixty-three (42.6%) had computers available in their classrooms and 57 (38.5%) did not have computers available in their classrooms.

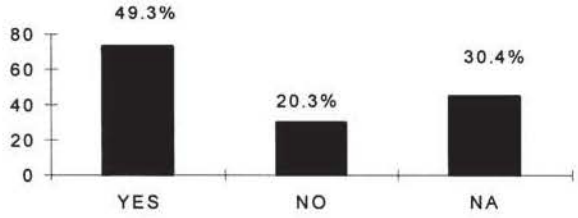

Figure 7. Accounting instructors who use computer labs for their accounting classes.

Forty-five (30.4%) of the instructors did not answer this question. Of the participants, 73 (49.3%) used a computer lab for instruction and 30 (20.3%) did not use a computer lab.

Table I gives the results of when the accounting instructors believed computers should begin to be used in the accounting curriculum. Considering these results, 76.3% of accounting instructors believed that computers should be used in the first year of high school accounting. Also, 45.3% believed computers should be used during the first semester of high school accounting.

Independent t-tests were performed on all the statements shown in Tables I and II. These tests compared responses from the groups: type of school, currently teaching accounting, age groups, teaching a separate automated accounting class, incorporate computers in accounting class, and computers available in the accounting classroom (Figures 1 - 6).

Table II gives opinions of accounting instructors about various statements concerning computer use in accounting education. Many of the statements

TABLE I

WHEN TO BEGIN USING COMPUTERS

Period	Number of Instructors	%
High School		
First Year		
First Semester		
1st half	43	29.1
2nd half	24	16.2
Second Semester		
1st half	27	18.2
2nd half	19	12.8
Second Year		
First Semester		
1st half	11	7.4
2nd half	3	2.0
Second Semester		
1st half	3	2.0
2nd half	3	2.0
Community College		
First Year		
First Semester		
1st half	3	2.0
2nd half	4	2.7
Second Semester		
1st half	1	0.7
2nd half	1	0.7
No Answer	6	4.1
Total	148	99.9[a]

[a]Not equal to 100 due to rounding of percentages

indicated no significant differences between the groups tested. A majority of the participants (59.4%) agreed that financial or budget concerns are the main reason computers are not used in accounting classes. More than half (67.5%) concluded that computer integration reduces tedious bookkeeping activities and allows time for higher-level activities. Most instructors (57.4%) perceived that computers help students learn accounting concepts. Another statement on which the majority of instructors (51.3%) agreed was that computers should be used only to reinforce accounting concepts. Whereas 96% of the instructors agreed that accounting classes should have access to computer labs, only 49.3% had access to computer labs (Figure 7). A majority of the instructors (53.4%) disagreed with teaching automated accounting as a separate class. Even though 21% agreed with teaching a separate automated accounting class, only 14.9% of the participants were teaching such a class (Figure 4).

Tables III - VIII show the independent t-Tests that indicated significant differences. There were three areas where significant differences were found between community college and high school instructors. One statement indicated a significant difference between instructors who teach a separate automated accounting class and instructors who do not. Another indicated a significant difference between age groups. Finally, there was a significant difference in one statement between instructors with computers and those without computers in their classroom.

TABLE II

COMPUTER USE IN ACCOUNTING EDUCATION

	Percentage of Each Response					
	SA	A	U	D	SD	NA
When computers are *not* used in the accounting class, financial or budget concerns are the main reason.	20.9	38.5	14.9	18.2	3.4	4.1
Computer integration into the accounting class enables students to work at their ability level.	8.1	37.2	33.1	17.6	2.0	2.0
Computer integration into the accounting class reduces tedious bookkeeping activities and allows time for higher-level activities.	21.6	45.9	14.2	14.9	1.4	2.0
Students must master accounting concepts before computer activities can be integrated into the accounting class.	74.3	20.3	.7	2.0	1.4	1.4[a]
Students must master manual preparation of documents before computer activities can be integrated into the accounting class.	58.1	27.0	5.4	6.1	2.0	1.4
The use of computers aids students in learning accounting concepts.	18.9	38.5	24.3	14.9	2.0	1.4
Accounting classrooms should have computers.	35.8	39.9	12.8	8.8	.7	2.0
Computers should be used only to reinforce accounting concepts.	21.6	29.7	13.5	27.7	6.1	1.4
Automated accounting should be taught as a separate class.	8.8	12.2	23.0	41.9	11.5	2.0[b]
Accounting classes should have access to computer labs.	69.6	26.4	2.7	0	0	1.4[c]

[a]Total of row does not equal 100 due to rounding percentages

[b]Total of row does not equal 100 due to rounding percentages

[c]Total of row does not equal 100 due to rounding percentages

Table III and IV report significant differences on when to begin using computers in the accounting classroom. Numbers 1 to 16 were assigned consecutively to each quarter including first and second years of accounting in high school and first and second years of accounting in college. The instructors circled the number that corresponded to the time they felt computers should be integrated into the accounting class. The means were calculated from these numbers.

Tables V - VIII also report significant differences. The participants' answers indicated their degree of agreement with each statement (Table II). Numbers 5 - 0 were assigned in order from strongly agree (SA) to no answer (NA). The means were calculated from these numbers.

TABLE III

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN SECONDARY AND COMMUNITY COLLEGE INSTRUCTORS ON WHEN TO BEGIN USING COMPUTERS IN ACCOUNTING

Group	Number of Cases	Mean	Standard Deviation
Secondary	127	2.6850	1.8374
Community College	21	5.4762	4.1547
	t = -3.030	df = 21.311	p = .006

Note. SPSS Base 7.0 for Windows corrected for inequality of variances.

The t-Test indicated a significant difference between secondary and community college instructors on when to begin using computers in accounting. Secondary instructors indicated that the end of the first semester or the beginning of the second semester of the first year of accounting (M = 2.6850) would be the best time to begin integrating computers into the accounting curriculum. However, the community college instructors indicated that the beginning of the second year of accounting (M = 5.4762) would be the best time to begin using computers in accounting instruction.

TABLE IV

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN INSTRUCTORS WHO HAVE A SEPARATE AUTOMATED ACCOUNTING CLASS AND INSTRUCTORS WHO DO NOT ON WHEN TO BEGIN USING COMPUTERS IN ACCOUNTING

Group	Number of Cases	Mean	Standard Deviation
Do	22	4.3636	2.9039
Do Not	126	2.8571	2.3519
	t = 2.673	df = 146	p = .008

The t-Test indicated a significant difference between instructors who have a separate automated accounting class and instructors who do not on when to begin using computers in accounting. Instructors who teach a separate automated accounting class felt that computers should be introduced during the last part of the first year (4th quarter) of accounting (M = 4.3636) However, those who do not teach a separate automated accounting class felt that computers should be introduced sometime during the last part of the first semester (2nd quarter) of accounting (M = 2.8571).

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TABLE V

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN INSTRUCTORS LENGTH OF TEACHING ON WHETHER COMPUTER INTEGRATION ENABLES STUDENTS TO WORK AT ABILITY LEVEL

Group	Number of Cases	Mean	Standard Deviation
0-14 years	66	3.0606	1.1215
15-25+ years	82	3.4146	.9422
	t = -2.087	df = 146	p = .039

The t-Test indicated a difference between instructors' length of teaching on whether computer integration enables students to work at ability level. Accounting instructors with more experience (15 or more years) were more likely to agree (M = 3.4146) that using computers helps students to work at their own ability level. The instructors with less experience (0 to 14 years) were more likely to be undecided (M =3.0606) about computers enabling students to work at different levels of ability.

TABLE VI

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN INSTRUCTORS WHO HAVE COMPUTERS IN THEIR ACCOUNTING CLASSROOM AND INSTRUCTORS WHO DO NOT ON WHETHER STUDENTS MUST MASTER ACCOUNTING CONCEPTS BEFORE USING COMPUTERS

Group	Number of Cases	Mean	Standard Deviation
Do	63	4.4762	1.0755
Do Not	57	4.8246	.3837
	t = -2.407	df = 78.944	p = .018

Note. SPSS Base 7.0 for Windows corrected for inequality of variances.

The t-Test indicated a significant difference between instructors who have computers in their accounting classroom and instructors who do not on whether students must master accounting concepts before using computers. All instructors (120) who have computers available either in computer labs or in their classrooms agreed that students must master manual preparation of documents before integrating computers into their accounting instruction. However, those who do not have computers in their accounting classrooms agreed more strongly

(M =4.8246) than instructors who have computers available in their classrooms (M = 4.4762).

TABLE VII

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN SECONDARY AND COMMUNITY COLLEGE INSTRUCTORS ON WHETHER STUDENTS MUST MASTER MANUAL PREPARATION OF DOCUMENTS

Group	Number of Cases	Mean	Standard Deviation
Secondary	127	4.4016	1.0178
Community College	21	3.6190	1.322
	t = 2.589	df = 24.076	p = .016

Note. SPSS Base 7.0 for Windows corrected for inequality of variances.

The t-Test indicated a significant difference between secondary and community college instructors on whether students must master manual preparation of documents before using computers. The community college instructors were undecided (M = 3.6190) while the secondary instructors agreed (M = 4.4016) that students should master manual preparation of documents before computers are integrated into accounting instruction.

TABLE VIII

INDEPENDENT T-TEST FOR DIFFERENCE BETWEEN SECONDARY AND COMMUNITY COLLEGE INSTRUCTORS ON WHETHER ACCOUNTING CLASSROOMS SHOULD HAVE COMPUTERS

Group	Number of Cases	Mean	Standard Deviation
Secondary	127	4.0472	1.0828
Community College	21	3.3810	1.1170
	t = 2.601	df = 146	p = .010

The t-Test indicated a significant difference between secondary and community college instructors on whether accounting classrooms should have computers. Community college instructors were more undecided (M = 3.3810) as to the need of computers in the accounting classroom. The secondary instructors agreed (M = 4.0472) that computers are needed in the accounting classroom.

Chapter 5

Summary, Conclusions, and Recommendations

Summary

The purpose of this study was to determine if accounting instructors are using computers in Accounting I and when they feel computers should be introduced into the accounting curriculum. It was also concerned with the agreement between community college and secondary instructors about computer use in accounting. The results of this research were obtained through a survey sent to secondary and community college educators. The participants of the survey (Appendix A) were all accounting department chairs in community colleges in the state of Illinois and a random sample of the accounting department chairs of the secondary schools in the state. Of the recipients (148), 126 were secondary instructors and 22 were community college instructors. The results of the survey were entered into the SPSS computer program for statistical analysis. Independent t-Tests were used to determine significant differences at a significance level of .05.

Conclusions

Of the 148 participants of the survey, 81.1% said they incorporated computers into their accounting classes. Less than half (42.6%) had computers available in their classrooms and only 33.8% had one computer for each student. Computer labs were available to only 49.3% and in their labs, 45.3% had one computer for each student. If educators are being held responsible for preparing

students for the business world, it seems that there is a need for more computers to help meet this responsibility.

One significant difference between secondary and community college instructors was their opinions about the need for computers in accounting classrooms. Community college instructors were undecided while secondary instructors agreed that computers are needed in accounting classrooms. High schools are not as likely to have computer labs available to students as community colleges. Most high school computer labs have classes assigned to them at various times during the day. However, community colleges probably have computer labs designated for student use at all times. This may explain the difference of opinion as to the need of computers in the classroom.

Even though 85.1% of the participants agreed that students must master manual preparation of documents before integrating computers into the curriculum, there was another significant difference between community college and secondary instructors. Community college instructors were undecided, but secondary instructors agreed that mastery of manual preparation should take place before computers are used. It may be that community college instructors feel that students need at least one year of high school accounting before there can be mastery of manual preparation of documents.

Most participants (76.3%) believed that computers should be used during the first year of accounting. However, another significant difference existed between secondary and community college instructors. Secondary instructors

believed that computers should be introduced into the accounting curriculum during the last half of the first semester (2nd quarter). However, community college instructors believed that computers should be introduced at the beginning of the second year of accounting. This may be due to the difference in the amount of material covered in the first year of high school accounting compared to the amount of material covered in the first year of college accounting. About the first three chapters of the college textbooks review the material covered in the first year of high school accounting. This may be additional evidence that community college instructors feel that high school students do not reach mastery during the first year of high school accounting. Therefore, instructors should wait until the second year to begin integrating computers.

The fourth area of significant difference also dealt with when to begin integrating computers into the accounting curriculum. Instructors who taught a separate automated accounting class felt that students should wait until the end of the first year of accounting before using the computer. However, instructors who were not teaching a separate automated accounting class indicated that computers should be introduced at the end of the first semester of accounting. Instructors who teach separate classes for automated accounting may feel that if computers are used to teach accounting, the entire curriculum of the class should be taught on the computer. Therefore, only an introduction of the

computer is needed at the end of the first year of accounting in preparation of the automated accounting class.

Another area of significant difference was between instructors with varying lengths of teaching experience on whether computer integration enables students to work at ability level. The instructors with more experience felt that computers were more likely to allow students to work at their own ability level while the instructors with less experience were undecided. Perhaps the difference comes from the actual experience of the instructors. The more experienced instructors may realize that all students learn differently and by a variety of teaching tools. Therefore, allowing students the freedom to work at their own pace through computer activities could be a vehicle of ability level learning.

There was also a significant difference dealing with whether students must master accounting concepts before using computers. This difference was between accounting instructors who had computers in their classroom and accounting instructors who did not. The majority of instructors agreed (94.6%) that computers should not be used until students master accounting concepts. However, those who did not have computers agreed more strongly than the instructors who did have computers in their classrooms. This difference may be due to the availability of computers to the instructors. Those who did not have computers readily available to them might not use computers as soon. These instructors may wait until an entire class period could be devoted to computer

activities. If computers were in their classroom, it would be much easier to incorporate them earlier into their curricula.

Using computers is definitely a part of the accounting curriculum. This study indicated that 76.3% of accounting instructors believe that computers should be integrated into the high school Accounting I curriculum. Of those, 45.3% believe that computers should be introduced during the first semester.

Recommendations

These findings indicated that there is general agreement among accounting instructors about the need to integrate computers into the accounting curriculum and that they are doing this to varying degrees. Further study is needed in the areas of types of software and computer applications the instructors are using.

Because of the use of computers in the work world, the need to revise curriculum has arisen. Researching the curricula of instructors who are using computers in their Accounting I classes would help other instructors. The curricula used to teach accounting needs to be similar for all teachers to better prepare students for the world of work.

Discussion between community college and secondary instructors seems to be needed. Students need agreement between high school and community college curricula in order to be successful in completing the Tech-prep programs. Resolution of the differences found between them could possibly result in better preparation of students.

There was a significant difference of opinion on whether computer integration enables students to work at their ability levels. Comparing the progress of students at the end of Accounting I of those who have used computers and those who have not used computers could be a great benefit to accounting instructors. A study of the successes/failures of students in the work place who had computers in Accounting I might also help instructors revise their curricula.

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Appendix A

COMPUTER USE IN THE ACCOUNTING CLASS

Directions: Please respond to the items in sections I, II, and III of the survey below. If you are not currently teaching accounting, please pass this survey to someone who is. Complete the survey even if accounting is not being taught this year in your school. The purpose of this survey is to determine the feelings of instructors about the use of computers in the accounting class and to determine the actual use of computers in the accounting class.

SECTION I

1. Check the type of school in which you are currently teaching.

   _____ Secondary education _____ Community College

2. Are you currently teaching accounting?

   _____ Yes _____ No

3. Mark the number of years, including this year, you have taught accounting.

   _____ under 5
   _____ 5 - 9
   _____ 10 - 14
   _____ 15 - 19
   _____ 20 - 24
   _____ 25 +

4. Do you teach a separate automated accounting class at your school?

   _____ Yes _____ No

5. Do you incorporate computers into your accounting classes?

   _____ Yes _____ No

If you answered no to question 5, you may skip questions 6 - 9 and go to SECTION II of the survey.

6. Do you have computers in your accounting classroom?

_____ Yes _____ No

If yes, how many computers are available?

_____ only 1
_____ 1 for each student
_____ students share

7. Do you take your class to a computer lab for computer activities?

_____ Yes _____ No

If yes, how many computers are available?

_____ 1 for each student
_____ students share

8. What type of software do you use in your accounting class? Please list the names of the software.

_____ accounting software _____

_____ textbook software _____

_____ spreadsheet program _____

SECTION II

Indicate when you feel students should **begin** using computers in accounting.

HIGH SCHOOL							
First Year				Second Year			
First Semester		Second Semester		First Semester		Second Semester	
1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half

COMMUNITY COLLEGE							
First Year				Second Year			
First Semester		Second Semester		First Semester		Second Semester	
1st half	2nd half	1st half	2nd half	1st half	2nd half	1st half	2nd half

SECTION III

Rate your perceptions to the following statements.

Circle your response.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
When computers are *not* used in the accounting class, financial or budget concerns are the main reason.	5	4	3	2	1
Computer integration into the accounting class enables students to work at their ability level.	5	4	3	2	1
Computer integration into the accounting class reduces tedious bookkeeping activities and allows time for higher-level activities.	5	4	3	2	1
Students must master accounting concepts before computer activities can be integrated into the accounting class.	5	4	3	2	1
Students must master manual preparation of documents before computer activities can be integrated into the accounting class.	5	4	3	2	1
The use of computers aids students in learning accounting concepts.	5	4	3	2	1
Accounting classrooms should have computers.	5	4	3	2	1
Computers should be used only to reinforce accounting concepts.	5	4	3	2	1
Automated accounting should be taught as a separate class.	5	4	3	2	1
Accounting classes should have access to computer labs.	5	4	3	2	1

Appendix B

February 17, 1997

«DEPARTMENT»
«SCHOOL»
«ADDRESS»
«CITY» «STATE» «ZIP»

COMPUTER USE IN THE ACCOUNTING CLASS

Are your accounting classes what you wish they were? Do you agree with the opinions of leaders in business education about the use of computers in your accounting classes? Do the leaders in business education know what is going on in the accounting classroom?

I am trying to find out if teachers are able to use computers in their accounting classes the way they feel they could be used. You can help resolve this question by taking just a few minutes to answer the enclosed questionnaire. The questionnaire concerns your feelings about how computers should be used and how they are actually being used in the accounting classroom.

A stamped envelope is enclosed for you to return the questionnaire. Your response will contribute to the improvement of accounting instruction. Remember it will take only a few minutes to complete. Please return the questionnaire in the enclosed envelope by March 10, 1997.

Janet G. Johnson

Enclosure