

# AN EXPLORATORY STUDY OF LEARNER USE OF A COMPUTERIZED ACCOUNTING TUTORIAL

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*The accounting profession has indicated that graduates should be better prepared to meet the challenges of the profession. One way to accomplish this goal is to increase students' exposure to technology. This study qualitatively examined the experiences of eight students using a computer-assisted tutorial as a method of instruction for two chapters of a financial accounting course. I collected data on a real-time basis in the form of think-aloud protocols, observations, and interviews. Findings revealed that the students had a positive learning experience. They indicated that the tutorial exhibited social presence—the ability of a communications medium to approximate face-to-face communication, an extension of this definition from distance learning literature.*

Historically, the lecture has been the predominant teaching method in accounting, as well as in many other disciplines. Accounting professionals and educators have indicated, however, that this method might not be the best way to prepare students for entry-level positions (American Accounting Association [AAA], 1986; Arthur Andersen & Co. et al., 1989). The consensus is that there is too much emphasis on memorization, too much lecture, and not enough creative types of learning like teamwork, case analysis, and technology assignments (Albrecht & Sack, 2000).

In 1989, representatives of the large accounting firms published a position paper and suggested that the current textbook-based, rule-intensive, lecture/problem-solving style of teaching should not survive as the primary means of knowledge presentation. They recommended that alternative teaching methods, such as simulations, expanded written assignments, and creative use of information technology (IT) be used. This need still exists today. Accounting educators need to use more innovative methods of presenting information to enable their students to be better prepared and more successful in the profession. Computer-assisted instruction (CAI) and interactive multimedia (IMM) are potential alternative presentation methods.

When evaluating these new methods of presenting accounting concepts, accounting educators should consider instructional methods' impact on students' learning, as well as students'

perception of their learning. When educators consider the diverse learning styles of students, they might make better decisions regarding the introduction of different teaching methods.

“Learning style refers to the consistent way in which a learner responds to or interacts with stimuli in the learning context” (Loo, 2002, p. 252).

Insights into students' learning styles might provide information about how they best acquire knowledge. Since students with different learning styles exhibit different strengths and can, thereby, learn course material by using various learning methods (Dunbar, 2004), certain learning styles should be better suited to learning via an interactive computer-assisted method than others.

In addition to individual differences in learning styles, educators should consider students' attitudes toward the use of computers. For example, computer anxiety may have a negative effect on student performance (Desai, 2001). Therefore, educators must be sensitive to students who are uncomfortable with using computers in the learning process.

A third factor that might be considered is comfort with learning in a solitary environment. Students have traditionally learned accounting

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through the lecture method—with a live instructor and any number of classmates. This learning method exhibits a high degree of social presence, a concept defined as the ability of a communications medium to approximate face-to-face communication (Short, Williams, & Christie, 1976). It is conceivable that a feeling of isolation might cause discomfort with the computer-assisted learning method, which might cause the overall learning experience to be negative.

Media exhibit social presence if they contain immediacy, a measure of the psychological distance between the communicator and the object(s) of the communication (Wiener & Mehrabian, 1968). Characteristics of immediacy include eye contact, smiling, and vocal expressiveness in a face-to-face environment (Gorham, 1988) and the use of first names and personal stories in online environments (Swan & Richardson, 2003).

Later definitions of social presence indicate that it exists in media that are interactive. If the user perceives the existence of interactivity, the medium has social presence (Gunawardena, 1995; Tu, 2002). Characteristics of interactivity include user inputs accepted by and responded to by the medium and the speed with which the medium responds to user inputs. Another characteristic is the number of situations or experiences that can be modified by the user, such as the placement of objects within the exercise. Finally, the ability of the user to change items is considered to be an example of interactivity. Examples of this characteristic include controlling one's own pace and the ability to move the program in more than one direction, as well as the ability to move objects (Lombard & Ditton, 1997).

Researchers have found that media with a high degree of social presence (closer proximity to face-to-face communication) have a positive influence on user satisfaction (Boverie, Nagel, McGee, & Garcia, 1997; Gunawardena & Zittle, 1997; Miranda & Saunders, 2003; Turman & Schrodtt, 2005). In fact, Turner and Schrodtt suggest that a combination of face-to-face and media-rich technology, such as online discussion threads, enhances students' motivation to learn. Attributes of a medium that would indicate a high

degree of social presence include feedback, information transmission, and problem solving (Short et al., 1976). Each of these attributes should exist in order for CAI or IMM to effectively transmit knowledge or information. In a computer-mediated communication (CMC) environment, low social presence had a negative effect on the depth of information sharing (Miranda & Saunders, 2003). Therefore, the existence of social presence appears to be a necessary element to a successful learning environment. Instructors in virtual learning communities can increase social presence by “ensuring that there is immediacy and intimacy in the way they communicate with students. This is best accomplished by the synchronous communication that occurs in regularly scheduled online chats and virtual office hours, and not simply by e-mail correspondence” (Wang & Newlin, 2002).

#### PURPOSE OF THE STUDY

This article describes a qualitative study that sought to understand the experiences of students learning accounting concepts via a multimedia tutorial, rather than the traditional lecture. Prior studies of software use in the context of accounting education have focused on student achievement (Elikai & Marts, 2000; Green, Reinstein, McWilliams, 2000) and collected quantitative data. Despite the increase in technology use in accounting education, there was no research published in this area since the late 1980's (Elikai & Marts, 2000). This study sought to understand the experiences of students learning accounting using a sophisticated multimedia-based tutorial that substituted for face-to-face instruction. The qualitative case was well-suited to collect data that would describe the feelings and reactions of these students as they navigated learning one-on-one with the tutorial, rather than many-on-one with a live instructor.

Creswell suggested that the qualitative case study is the best approach when one is studying “a bounded system over time through detailed, in-depth data collection involving multiple sources of information rich in context” (Creswell, 1997, p. 61). The bounded system in this investigation

was the experience of learning two units of material via the tutorial and the learners' qualitative data via think-aloud protocols (recorded transcripts of every word spoken by the participants while they participated in the learning process and individual interviews). In addition, data included recorded observations of the students' behaviors. This method and resultant data provided answers to the following research questions:

R<sub>1</sub> How do students engaged in CAI react to its challenges and opportunities?

R<sub>2</sub> How did the experiences of these students compare to the major explanations offered in the literature for student reaction to CAI (including learning styles, attitude toward computers, and social presence)?

## METHOD

This qualitative case study examined the experiences of eight students learning two chapters of introductory financial accounting via a computer-assisted multimedia tutorial. I chose students in this purposeful sample (see Table 1 for demographic data) based on their learning styles (measured by Kolb's Learning Style Inventory (LSI, 1985)) and their attitudes toward computers (measured by the Computer Attitude Scale (CAS) (Nickell & Pinto, 1986). Information about the Kolb LSI and the CAS is available at <http://www.hayresourcesdirect.haygroup.com> and <http://www.mnstate.edu/nickell/research.htm>. An ideal sample would have included one male and one female representing each of Kolb's four learning styles: converger, diverger, accommodator, and assimilator. However, there

was only one student in the class of 24 that possessed the assimilator learning style. Therefore, the fourth male participant chosen was a converger.

Higher education research often uses Kolb's Learning Style Inventory, and studies suggest that this instrument exhibits reliability (James & Blank, 1993). Individuals are classified based on their responses to the 12-item LSI. The students responded to sentences, such as "When I learn:" or "I learn best when:," by ranking four sentence endings that best described how they learn. These endings correspond to Kolb's four learning modes (concrete experience, reflective observation, abstract conceptualization, and active experimentation). The learning style is the relationship of the scores for those learning modes.

The Computer Attitude Scale, a general measure of computer attitudes, is a 20-item, self-reporting instrument that is easy to complete and has a reported coefficient alpha of .81 (Zakrajsek, Waters, Popovich, Craft, & Hampton, 1990). Individuals who score 20 on the instrument have an extremely negative attitude toward computers, whereas those who score 100 have an extremely positive attitude toward computers. A score of 60 is neutral. The scores of students that participated in this study ranged from 67 to 92, which indicated that each student scored in the favorable range. These scores compared to those of classmates who did not participate in the study.

Instead of attending lectures for two topics covered in the course (inventory and stockholders' equity), students spent approximately 60 minutes on two separate occasions learning the material via the tutorial.

**Table 1. Demographic Data**

Name	GPA	Learning Style	CAS Score	Major	Age	Class
Allen	3.08	Diverger	76	Econ/Bus	20	Sophomore
John	2.99	Converger	80	AB Engg.	21	Junior
George	2.68	Accommodator	75	Econ/Bus	19	Sophomore
Steve	3.90	Converger	83	Econ/Bus-CS	18	Sophomore
Karen	3.10	Converger	83	Econ/Bus	19	Sophomore
Linda	2.65	Diverger	67	Econ/Bus	20	Sophomore
Kathy	2.50	Accommodator	74	Econ/Bus	19	Sophomore
Sharon	3.11	Assimilator	92	Math/Econ	19	Sophomore

The tutorial included textual information, diagrams, sample financial statements, and other descriptive items, such as articles of incorporation and proxy statements from well-known companies. Objective questions (true-false, multiple choice, and matching) provided in each section measured mastery of the concepts. If the student answered a question incorrectly, s/he was prompted to think about the answer again. The tutorial provided immediate feedback by utilizing a dialog box that stated “Try again.” or “Really, what about ...?” The student could answer the question as many times as s/he chose. If the student could not answer the question, s/he could obtain the correct answer from the tutorial.

Each section also illustrated business transactions. Students reviewed those transactions and completed additional exercises to ensure that the material was understood. They completed these exercises by dragging and dropping items on the screen into a box that replicated an actual accounting journal. Some sections required participants to perform cost calculations or complete financial statements. The tutorial again provided immediate feedback, which allowed the students to see if their answers were correct.

While students participated in the tutorial sessions, I collected three sources of data—think-aloud protocols, researcher observations (notes of non-verbal behavior and other participant reactions) and individual interviews—to allow the participants to discuss their reactions to the tutorial immediately after each session and answer open-ended questions about the experience. (See Appendix A for sample interview questions and responses.) Audio and video tapes capturing the verbal protocols were transcribed along with audio tapes of the interviews. Data also included written observation notes and answers to interview questions. “Triangulation” (Denzin, 1970) refers to the use of multiple sources of data to study the same unit. Merriam (1998) noted that triangulation brings together dissimilar methods to study the same unit—in this case, each student.

I began data analysis during the data collection period, which continued long after all data collection was complete. Data analysis is the process of making sense of the data (Merriam,

1998). The purpose of data analysis in qualitative research is to allow the researcher to present the data as descriptions and themes. To aid in this process, I employed the program, QSR NUD\*IST 4 (N4). This program assists qualitative researchers in analyzing unstructured data by supporting processes of coding data in an index system. The software allows a researcher to search for patterns in the textual data, construct and test theories, and generate reports about the data (QSR, 1997). N4 presents a hierarchy of researcher-created nodes (a coding scheme) that facilitate the retrieval of all data relating to a particular topic, the creation of new nodes during data analysis, and the preparation of memos and annotations that can later be coded for analysis. Codes included demographic data, such as gender, learning style, and computer attitude scale score. Codes added during the analysis phase related to patterns found in the data and led to themes which emerged upon further data evaluation. After coding for the attributes previously described, I used N4 and searched to find text that contained nodes or characters specified by the coding scheme. The program created reports that displayed the text units (such as a line or a paragraph) that contained the searched item (such as a node or a specific word). Reports allowed for comparisons of the students’ experiences to each other and to the results reported by other researchers according to such characteristics as learning style, attitude toward computers, and perception of social presence.

The following section discusses the themes that emerged upon analysis of the data and reports generated by N4, as well as similarities between the students’ experiences and those reported in prior studies. Two of the themes—“Our learning style fit our educational experience” and “We found the tutorial to exhibit social presence”—relate directly to prior studies on these topics.

## THEMES

One product of a qualitative case study is a series of themes that emerges from the collected data. These themes represent the participants’ feelings about the experience. Most students felt that this

was a positive learning experience, because the material presented was very relevant to them and they were able to learn the material in a different way while controlling the pace of the tutorial and, therefore, the pace of their learning. Some students indicated that they thought that the instructional method provided them with the motivation to learn the concepts presented by the tutorial. Perhaps the novelty of learning with a different method or the fact that the material presented is often of great interest to economics and business majors provided this motivation.

The students also indicated that they liked the way the tutorial presented the information, as well as the feedback given when they answered questions. They appreciated the fact that they would know immediately whether or not they answered questions correctly and, therefore, if they should review the material or advance to the next section. Alternating information and questions decreased the monotony that the students associated with the textbook. Although all but one of the students enjoyed the learning experience, the consensus was that the tutorial could be a supplemental learning method but should never completely replace lectures. They cited their inability to have their own questions answered. They believed that they could reinforce what they learned in class, but this method was not an acceptable substitute for an instructor and a textbook.

The data also indicated that the students felt that the tutorial appeared to exhibit social presence. In this study, the characteristics of social presence were applied to a medium other than computer-mediated communication. However, certain aspects of interactivity reported by Lombard and Ditton (1997) that are characteristics of social presence appeared in the tutorial. Media richness has been discussed in the literature as a characteristic that can be considered when evaluating social presence in a medium (Hertenstein, 1999). The tutorial contained two of the four features of media richness: feedback immediacy and use of natural language. The feedback aspect of the tutorial and the students' perception of its usefulness and helpfulness have been discussed. The use of natural language was another positive aspect of

the tutorial. The author often used real-world examples to explain accounting concepts. Students stated that these examples were extremely helpful in their understanding and remembering the tutorial material. This sentiment expressed by the students relating to social presence echoed that reported by Dirkin, Mishra, and Altermatt (2005) in a study of perceptions of social presence by students engaged in a multimedia learning environment.

In addition to the definition of social presence as approximating face-to-face communication, Short, Williams and Christie (1976) stated that it is also the extent to which a medium is perceived to convey the actual presence of another communicator. Although this definition has principally been linked with computer-mediated communication, such as e-mail, electronic chat rooms, and online learning communities (Gunawardena & Zittle, 1997; Joe, 1996; Kim, 1994; Swan & Richardson, 2003; Tu, 2002; Yoo & Alavi, 2001), this characteristic was present in the tutorial. Two of the students compared learning with the computer to receiving information from an individual. During an interview, one stated that the computer acted like a professor in that he didn't feel like he was on his own. He expressed this feeling when commenting about the feedback. Another student described the feedback as having a conversation with the tutorial about how to go about solving a particular problem. Although the other students did not mention this aspect of the tutorial as directly, their positive comments related to the three characteristics of social presence and interactivity (information transmission, problem solving, and availability of feedback) provided evidence of their perception that the tutorial exhibited social presence.

#### COMPARISON WITH PRIOR RESEARCH

A thorough review of the learning style, attitude toward computers, and social presence literature provided the conceptual framework for this study, and I found several instances where the experiences of these students were similar to those reported by other researchers. A list of the studies reviewed is shown in Appendix B.

### LEARNING STYLES

A comprehensive review of the characteristics of the four learning styles delineated in the LSI handbook (1985), as well as those reported by other researchers, marked the beginning of this study. Some of this study's findings regarding learning styles were compared to those reported in earlier studies. One study reported that convergers and assimilators earned higher grade point averages than divergers and accommodators (Wynd & Bozman, 1996). In most cases, this held true in the current study. One diverger had a higher GPA than one converger, but this might have been because the converger was an engineering major, considered to be a more difficult program than economics and business.

Several of the studies evaluated the connection between learning style and success with software or computer-assisted instruction. One study measured end-user computer satisfaction (Simon, 2000). Simon noted that active experimenters prefer a more exploratory learning method, whereas reflective observers are oriented toward a more traditional instructional technique. In an analysis of four studies that measured the influence of learning style on learning new software, Bostrom, Olfman, and Sein (1990) reported that abstract learners (assimilators and convergers) performed better than concrete learners (divergers and accommodators). Although this study did not measure performance, the convergers had little or no trouble completing the task requirements, such as answering questions or solving problems. The lone assimilator completed the tutorial with little difficulty, even though she disliked the learning method. In another study, convergers exhibited the highest overall performance in a training session on the use of e-mail (Sein & Robey, 1991). Again, although this study did not seek to measure performance, the three convergers were very successful in their completion of the task. They had less difficulty than the others in completing the exercises required by the software.

In a study of the impact of multimedia instruction on student achievement and attitudes, McDonald (1996) discovered that assimilators had a much more positive attitude toward

multimedia instruction than convergers. This was not the case in this study. Although the one assimilator in the group did not have a positive attitude about the method, she completed the task successfully. She indicated that it should have been more challenging and that a textbook provided more information. A study that measured an abstract learning style, though not through the use of the LSI, reported that abstract learners (assimilators and convergers) performed well in technology-based courses (Grasha & Yarbanger-Hicks, 2000).

In another study involving hypermedia, divergers and accommodators who used hypermedia software to solve accounting problems exhibited significantly higher achievement scores than individuals of the same learning styles who solved the problems in a more conventional manner (Grant, 1995). More specific learning style characteristics observed by Grant, such as the tendency of convergers to remain on task until completion or accommodators to rely on others for answers to their questions, existed in this study.

In a study that used learning style as a way to explain differences of students learning accounting with less traditional techniques, Jensen (1995) discovered that accommodator and assimilator members of the experimental group experienced significantly greater achievement than control group members possessing the same learning styles. Experimental group convergers experienced greater achievement than control group convergers, but not significantly. Since convergers tend to be successful in traditional educational settings, such as lecture and problem solving, the small difference in achievement should not be surprising. The three convergers in this study were good students who adapted well to the tutorial but might have been just as successful if exposed to other modes of learning.

Other similarities existed between the results discovered in this study and those reported by other researchers. Studies have indicated that convergers adapt well to new experiences and can successfully learn using technology. Active learners (accommodators and convergers) tend to be more comfortable in new environments than reflective learners (divergers and assimilators).

Of the three reflective learners, one had a much more positive experience than the others. The others stated that they preferred learning by lecture and/or textbook, i.e., more reflective ways to learn.

#### *ATTITUDE TOWARD COMPUTERS*

The other selection instrument used in this study was the Computer Attitude scale (Nickell & Pinto, 1986). The participant scores ranged from 67 to 92 (higher scores representing more positive attitudes). A prior study found that CAS scores indicating positive computer attitudes correlated with high computer science grades among college students (LaLomia & Sidowski, 1991). Although a converger was the only member of the group to study computer science along with economics and business, his 3.9 GPA indicated high grades in all of his courses. One study of computer anxiety (presumably a negative computer attitude) among Kolb's learning styles reported that convergers reported lower computer anxiety than divergers. The three convergers in this study had CAS scores of 80 or above, while the two divergers had CAS scores of 67 and 72. The author (Bozionelos, 1997) posited that active learners (convergers and accommodators) should have fewer negative feelings toward computer technology. A later study (Orr, Allen, & Poindexter, 2001) found no relationship between learning style and computer anxiety at the beginning of a computer literacy course. The researchers stated that computer experience led to an improvement in computer attitude.

Other factors that relate to positive computer attitudes include amount and type of computer use, as well as length of time of computer use (Durler, 1997; Mitra, 1998, Yildirim, 2000). One would have expected the economics and business/computer science major to have had a very high CAS score, given his high grades in computer science, his learning style, and the ease with which he completed the exercises. His score of 83, while not low, was lower than expected. His lack of experience with computers (due to the lack of availability in his home country) before starting college about seven months before the

onset of this study may have accounted for his lower score.

Another factor that might be considered is the impact of computer attitude on computer usage. A positive relationship exists between computer attitude and usage (Jawahar & Elango, 2001). The authors of this study measured computer attitudes, goal-setting, and self-efficacy and reported that each increased motivation, which, in turn, enhanced end-user performance. In this study, the students with the highest and lowest CAS scores did not have a positive experience. They both indicated that they preferred to attend a lecture than learn using the tutorial.

#### *SOCIAL PRESENCE*

Social presence studies relate to computer-mediated communication and distance learning environments, where the perception of the presence of another individual was an important characteristic of the medium (Boverie et al., 1997; Hackman & Walker, 1990; Tu, 2002). A characteristic of social presence that should be inherent in these media is immediacy, a measure of the psychological distance between those communicating (Wiener & Mehrabian, 1968). Some students indicated that they actually felt as though they were communicating directly with the computer during the exercise. One stated that being involved with the CAI compared to having a conversation with the computer. Another participant said that the immediate feedback exceeded what a student would get in a lecture. He compared the process with talking to the author and discussing how to solve the problems. This reaction can be associated with a source of immediacy in an online course—interactions between instructor and students (LaRose & Whitten, 2000).

Another attribute of teacher immediacy is the use of personal experiences. Some of the sections of the tutorial introduced accounting concepts with either cartoons, illustrating the concept of proxy wars, or comparisons to familiar concepts, as in a discussion of preferred and common stock using as an example the differences between the House of Lords and the House of Commons. The students often mentioned those examples, which

resemble the use of personal examples by an instructor.

The second concept linked to social presence is interactivity: the perception that a mediated experience is not actually mediated (Lombard & Ditton, 1997). Information transmission, problem solving, and feedback are characteristics of a medium that indicate interactivity and, therefore, social presence. These three elements were present in the tutorial.

As expected, the students stated that the tutorial software was interactive. Researchers have measured the existence of interactivity in a medium by observing several characteristics. One is the availability of user inputs accepted by and responded to by the medium, corresponding to the questions and problems that the students answered. Another is the speed with which the medium responds to the inputs—in this case, immediate—and the third is the number of situations that can be modified by the user, such as dragging account names and dollar amounts into a journal or financial statement (Lombard & Ditton, 1997). The tutorial possessed all of these characteristics that indicate interactivity and, therefore, social presence.

One other concept that could be considered in a discussion of social presence is media richness. The students perceived that two of the factors that indicate media richness—feedback immediacy and use of natural language (Hertenstein, 1999)—existed in the tutorial software. These elements allow still another way to consider the existence of social presence in the medium.

The definition of social presence is evolving from the initial characteristics of warm, personal, sensitive and social (Short et al., 1976) to include immediacy, interactivity, and media richness (Gunawardena, 1995; Hertenstein, 1999; Lombard & Ditton, 1997). Using this definition, social presence did, in fact, exist in the computer-assisted tutorial.

#### **CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH**

This qualitative case study sought to gain insight into the experience of students learning two

chapters of financial accounting via a CAI tutorial as an alternative to the traditional lecture. Few quantitative studies measuring achievement and attitudes on the use of mediated methods to learn the subject of accounting are present in the literature. This qualitative investigation reported on the experiences of eight students on a continuous basis in real-time, rather than after the fact.

Prior research indicates that certain learner or medium characteristics, such as learning style, attitude toward computers, or a perception of the existence of social presence, influence an individual's experience with a learning method. A positive impact on learning can occur if the learning method is matched with the learner's learning style. For example, when students are provided with learning methods, such as case study and group discussion, in addition to the traditional lecture, more learning modes are employed and performance in the course is enhanced (Dunbar, 2004; Jensen, 1995).

In addition to learning style, a person's attitude toward computers influences the experience of using a computer-mediated learning method. Characteristics that may lead to a more positive attitude toward computers include amount and type of computer use and level of workplace computerization (Brock & Sulsky, 1994; Mitra, 1998; Yildirim, 2000). As would be expected, greater computer use or computerization leads to higher computer attitude scores.

Finally, the perception of social presence might impact learning with a mediated method. Media that provide feelings of immediacy (close proximity between the communicator and listeners) contribute toward a perception of increased learning (Gorham, 1988; Hackman & Walker, 1990). Interactivity is also considered to be a characteristic of social presence. A medium is interactive if the user can modify objects within the medium, user's inputs can be responded to by the medium, and the user can control his or her pace (Lombard & Ditton, 1997). Since these characteristics may be present in computer software, the definition of social presence, linked to the area of computer-mediated communication, can be extended to CAI.

This study, due to its qualitative nature, employed a small group of students at one liberal arts college. A future study might compare achievement in the introductory course, where students in one section are taught using the traditional method, and those in another section acquire knowledge from a tutorial. Another study could quantitatively measure users' perceptions of the existence of social presence using the Social Presence Scale (Short et al., 1976) or a newer scale, such as the Social Presence and Privacy Questionnaire (Tu, 2002).

One could study the connection between learning style and achievement in accounting and/or learning under various methods, such as lecture vs. tutorial. In addition to tutorial CAI, researchers could evaluate the use of interactive exercises available on the Internet through publishers' websites or on CD/DVD. These media could reinforce text and lecture material and are, therefore, useful to students as supplementary learning materials. Evaluation of the effects on achievement when these additional materials are employed would help educators measure the efficacy of their use. Having additional resources available for students may help accounting programs produce graduates that possess both the technical competence, thinking skills, and technology experience that is required by the accounting profession.

## REFERENCES

- Albrecht, W. S., & Sack, R. J. (2000). *Accounting education: Charting a course through a perilous future*. Sarasota: American Accounting Association.
- American Accounting Association. (1986). Committee on the future structure, content, and scope of accounting education (The Bedford Committee), Future accounting education: Preparing for the expanding profession. *Issues in Accounting Education*, 1(1), 168-195.
- Arthur Andersen & Co., Arthur Young, Coopers & Lybrand, Deloitte, Haskins & Sells, Ernst & Whinney, Peat Marwick Main & Co., Price Waterhouse, and Touche Ross. (1989). *Perspectives on education: Capabilities for success in the accounting profession*.
- Bostrom, R. P., Olfman, L., & Sein, M. K. (1990). The importance of learning style in end-user training. *MIS Quarterly*, 14(1), 101-119.
- Boverie, P., Nagel, L., McGee, M., & Garcia, S. (1997). Learning styles, emotional intelligence and social presence as predictors of distance education student satisfaction. *Selected Papers from the National Conference of College Teaching and Learning*, Jacksonville, Florida.
- Bozionelos, N. (1997). Psychology of computer use: XLIV, Computer anxiety and learning style, *Perceptual and Motor Skills*, 84(3), 753-754.
- Brock, D. B., & Sulsky, L. M. (1994). Attitudes toward computers: Construct validation and relations to computer use. *Journal of Organizational Behavior*, 15(1), 17-35.
- Creswell, J. (1997). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks: Sage.
- Denzin, N. K. (1970). *The research act: A theoretical introduction to sociological methods*. Chicago: Aldine.
- Desai, M. S., (2001). Computer anxiety and performance: An application of a change model setting. *Journal of Instructional Psychology*, 28(13) 141- 149.
- Dirkin, K. H., Mishra, P., & Altermatt, E. (2005). All or nothing: Levels of sociability of a pedagogical software agent and its impact on student perceptions and learning. *Journal of Educational Multimedia and Hypermedia*, 14(2), 113-127.
- Dunbar, A. (2004). Genesis of an online course. *Issues in Accounting Education*, 19(3), 321-343.
- Durler, M. G. (1997). *An empirical analysis of the association between the intercompany effects of electronic data exchange and the level of computerization and integration of the accounting information system in small businesses*. Unpublished doctoral dissertation, The Louisiana State University.
- Elikai, F., & Marts, J., (2000). The impact of computer assisted learning on students' performance. *Journal of Business Disciplines* 1(1), 167-78.
- Gorham, J., (1988). The relationship between verbal teacher immediacy and student learning. *Communication Education*, 37(1), 40-53.
- Grant, J. (1995). *Hypermedia accounting software as a determinant of student success*. Unpublished doctoral dissertation, American University, Washington, D.C.

- Grasha, A. F., & Yarbanger-Hicks, N. (2000). Integrating teaching styles and learning styles with instructional technology. *College Teaching*, 48(1), 2-10.
- Green, B. P., Reinstein, A., & McWilliams, D. (2000). Using interactive courseware to teach the procedural components of introductory financial accounting. *Advances in Accounting Education*, 3, 179-197.
- Gunawardena, C. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications*, 1(2/3), 147-166.
- Gunawardena, C., & Zittle, F. (1997). Social presence as a predictor of satisfaction with a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3), 8-26.
- Hackman, M. Z., & Walker, K. B. (1990). Instructional communication in the televised classroom: The effects of system design and teacher immediacy on student learning and satisfaction. *Communication Education*, 39(3), 196-206.
- Hertenstein, E. (1999). Distance learning in labor education. *Labor Studies Journal*, 23(4), 3-11.
- James, W. B., & Blank, W. E. (1993). Review and critique of available learning style instruments for adults. In D. D. Flannery (Ed.). *Applying cognitive theory to adult learning. New Directions for Adult and Continuing Education*, No. 59. San Francisco: Jossey-Bass, 47-57.
- Jawahar, I. M., & Elango, B. (2001). The effect of attitudes, goal setting and self-efficacy on end user performance. *Journal of End User Computing*, 13(2), 40-45.
- Jensen, P. H. (1995). *The application of Kolb's experiential learning theory in a first semester college accounting course*. Unpublished Doctoral Dissertation, University of Memphis.
- Joe, S. (1996). *Socioemotional use of computer-mediated communication: Factors related to self-disclosure in CMC (electronic mail)*. Unpublished doctoral dissertation, University of Alabama.
- Kim, Y. (1994). *Electronic mail users' perceptions of computer-mediated vs. face-to-face communication: A comparative study*. Unpublished doctoral dissertation, Florida State University.
- Kolb, D. A. (1985). *Learning style inventory*. Boston: McBer.
- LaLomia, M. J., & Sidowski, J. B. (1991). Measurements of computer attitudes: A review. *International Journal of Human-Computer Interaction*, 3(2), 171-197.
- LaRose, R., & Whitten, P. (2000). Rethinking instructional immediacy for web courses: A social cognitive exploration. *Communication Education*, 49(4), 320-338.
- Lombard M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer Mediated Communication*, 3(2). Retrieved June 29, 2006, from <http://jcmc.indiana.edu/vol3/issue2/lombard.html>
- Loo, R. (2002). A meta-analytic examination of Kolb's learning style preferences among business majors. *Journal of Education for Business*, 77(5), 252-256.
- McDonald, M. L. (1996). *The impact of multimedia instruction on student attitude and achievement and relationship with learning styles*. Unpublished doctoral dissertation, University of Nebraska.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks: Sage.
- Miranda, S. M., & Saunders, C. S. (2003). The social construction of meaning: An alternative perspective on information sharing. *Information Systems Research*, 14(1), 87-106.
- Mitra, A. (1998). Categories of computer use and their relationships with attitudes toward computers. *Journal of Research on Computing in Education*, 30(3), 281-295.
- Nickell, G. S., & Pinto, J. N. (1986). The computer attitude scale. *Computers in Human Behavior*, 2(4), 301-306.
- Orr, C., Allen, D., Poindexter, S. (2001). The effect of individual differences on computer attitudes: An empirical study. *Journal of End User Computing*, 13(2), 26-39.
- QSR. (1997). *QSR NUD\*IST 4 user guide*. Thousand Oaks: Sage.
- Sein, M. K., & Robey, D. (1991). Learning style and the efficacy of computer training methods. *Perceptual and Motor Skills*, 72(1), 243-248.
- Short, J., Williams, E., & Christie, E. (1976). *The social psychology of telecommunications*. New York: Wiley.
- Simon, S. J. (2000). The relationship of learning style and training method to end-user computer satisfaction and computer use: A structural equation model. *Information Technology, Learning, and Performance Journal*, 18(1), 41-59.

- Swan K., & Richardson, J. C. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), 68-82.
- Tu, C. H., (2002). The measurement of social presence in an on-line learning environment. *International Journal on E-Learning*, 1(2), 34-45.
- Turman, P. D., & Schrodt, P. (2005). The influence of instructional technology use on students' affect: Do course designs and biological sex make a difference? *Communication Studies*, 56(2), 109-130.
- Wang, A. Y., & Newlin, M. H. (2002). Predictors of performance in the virtual classroom: Identifying and helping at-risk cyber-students. *THE Journal*, 29(10), 21-26.
- Wiener M., & Mehrabian, A. (1968). *Language within language: Immediacy, a channel in verbal communication*. New York: Appleton-Century-Crofts.
- Wynd, W. R., & Bozman, C. S. (1996). Student learning style: A segmentation strategy for higher education. *Journal of Education for Business*, 71(4), 232-235.
- Yildirim, S. (2000). Effects of an educational computing course on preservice and inservice teachers: A discussion and analysis of attitudes and use. *Journal of Research on Computing in Education*, 32(4), 479-495.
- Yoo, Y., & Alavi, M. (2001). Media and group cohesion: Relative influences on social presence, task participation, and group consensus. *MIS Quarterly*, 25(3), 371-390.
- Zakrajsek, T. T., Waters, L. K., Popovich, P. M., Craft, S., & Hampton, W. T. (1990). Convergent validity of scales measuring computer-related attitudes. *Educational and Psychological Measurement*, 50(2), 343-349.

<b>Appendix A. Sample Interview Questions and Responses</b>
<b>How do you rate the presentation of information and the problems that you were required to solve?</b>
Sometimes they had questions and then the answers on the next page. I thought that was silly. Maybe that was to reinforce. I didn't think the problems were challenging enough, even though I didn't get them right. If they were, I would have read it more thoroughly (Sharon).
I like how it asks you questions after you learn something, it was right there, and I liked how it let you know the answers. The problems were a little frustrating because I thought I was putting it in the right column and it wasn't going there. They weren't that bad (Kathy).
I thought it was better than the book because it asked you questions right after. I liked the problems after I figured out how to do them. Some of them were hard, and I didn't know what to do with them at first; it helped that it told you that you were right or wrong (Karen).
Sometimes I thought the presentation was a little backward, like when it asked questions before presenting. But, that's what it's like in Engineering. My Thermo professor wants us to come to class with all the homework done. The lecture is easier to understand, but he rips us apart on the homework. Some of the problems were more difficult than others. In the beginning, it was difficult to understand that the accounts and the dollar amounts didn't move together into the journal entries. After it wouldn't let me place them in the spaces I thought it belonged, I finally figured it out (John).
I think the information was definitely presented well. This is new to all of us. I had an idea of the numbers to use, but I wasn't sure how to formulate them. They let us take a stab at the information that is challenging and in the end they lay it out for you. The problems were challenging because I hadn't seen it before. It took me months to get my lay-up down in basketball, so it's just new (Allen).
Everything was in place with the information. If I had spent a lot of time and gotten them right, I would say that the problems were easy, but the mere thing that I wasn't getting them right, tells me I must start reading on accounts again (Steve).
<b>What did you think of the feedback?</b>
I said that when I was actually going through that process that I like how the box popped up there were some answers that I had false and right away you started to think about some other part of activity or the other information it told you the right answer and it told you the right direction to go with the whole thing, so I actually liked that a lot (Allen).
I liked that it not only told me that my answer was wrong, but gave a little hint sometimes about something else to consider, such as "what about cash dividends" (John).
After you did a problem it showed you that you got it right and every one had the reason why an answer was correct. It was easy to see how they got the answers (Kathy).
It didn't bother me when it said 'try again' but I like to find the answer myself, so I didn't ask for the answer unless I really couldn't get it (Karen).
I liked it; sometimes I didn't like the way it was organized, like they tell you afterward what to expect. They haven't gone over it, when they're just starting out and you have no clue you don't want to get things wrong. I became frustrated when I answered a question and it said "really" because it made me feel stupid. I didn't mind when it said "what about this" (Linda).
First of all and most important is the immediate feedback. It is like going to the person who wrote the tutorial and say if you multiplied 25 by 2 you will get this and how the answer is that. It's like having a conversation with the tutorial (Steve).
I'm trying to think that if it told me the answer was wrong, if it stuck in my head. Sometimes it induced me to go back and check, but mostly it didn't make me want to go back and look (Sharon).
<b>Did you find this to be a meaningful learning experience? Interpret meaningful in whatever way you like.</b>
Meaningful, I guess being an economics and business major, this information, I mean when you look at just business in general you are talking about dividends, stocks, bonds, all the in-between things that go along with that, just like all the information and ex-dividends, the cum-dividends, it was definitely meaningful. This is stuff I'll be applying to my everyday world pretty soon (Allen).
I feel that this was definitely a meaningful learning experience. This was a different way than I've ever learned before. And I wouldn't mind doing it again. I thought it was interesting and new and made me want to stick to it to see what came next, especially when I was solving all the different examples and questions and the different ways to answer the questions. I wanted to go ahead and find something new and look for more stuff (George).
Yes, I would like to do this again, to get a more solid understanding of the material. Also, this would be a good preparation for class. I would think that the lecture would be clearer if I went through this first (John).
Not really, but I'll remember some stuff. This could have tested my knowledge more if I allowed it to. If this was my only source of information instead of class, I would definitely have a hard time (Sharon).
Even though I thought this was very helpful, it wouldn't work on its own. We still have to use the textbook and go to class. That has to remain as the primary source (Steve).
I would actually like to do this again. I think it was kind of motivating. It wasn't like the book where you just sit and read and can fall asleep (Linda).

<b>Appendix B. Contrasted Reference Sources</b>		
<b>CAI</b>		
Elikai & Marts	2000	Computer-assisted learning in Cost Accounting
Green, Reinstein, & McWilliams	2000	Interactive courseware in Introduction to Accounting
<b>ATC</b>		
LaLomia & Sidowski	1991	CAS scores and success in computer science
Bozionelos	1997	Learning style and CAS score
Durler	1997	Length of computer use and computer attitude
Mitra	1998	Type of computer use and computer attitude
Orr, Allen, & Poindexter	2001	Learning styles and computer anxiety
Jawaher & Elango	2001	Computer attitude and usage
<b>SP</b>		
Gunawardena	1995	Social presence theory
Lombard & Ditton	1997	Media richness and social presence
Hertenstein	1999	Characteristics of interactivity/social presence
Boverie, Nagel, McGee, & Garcia	1997	Social presence and distance education
LaRose & Whitten	2000	Immediacy in an on-line course
Yildirim	2000	Computer use and attitudes
Miranda & Saunders	2003	Social presence and user satisfaction
Dirkin, Mishra, & Altermatt	2005	Social presence and perception of learning
<b>LS</b>		
Bostrom, Olfman, & Sein	1990	Learning style/performance with new software
Sein & Robley	1991	Learning style and electronic mail systems
Grant	1995	Learning style/hypermedia software use in accounting
Jensen	1995	Learning style and less traditional teaching methods in accounting
McDonald	1996	Learning style and attitude toward multimedia instruction
Wynd & Bozman	1996	Learning style and GPA
Grasha & Yarbanger-Hicks	2000	Learning style and information technology based courses
Simon	2000	Learning style and end-user computer satisfaction
CAI – Computer Assisted Instruction		ATC – Attitude Toward Computers
SP – Social Presence		LS – Learning Styles

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