

Collaborative Accounting Problem Solving Via Group Support Systems in a Face-to-Face Versus Distant Learning Environment

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This study is an examination of how GSS learning environments (face-to-face vs. distant) and task difficulty level (simple vs. difficult) influenced participation levels and social presence among accounting students working collaboratively on an accounting task. A sample of 128 volunteer accounting students, randomly assigned to groups of four, experienced either a face-to-face or distant GSS learning environment and completed either a simple or difficult collaborative accounting task. Participation levels and social presence perceptions were significantly higher in the face-to-face than in the distant GSS learning environment for both tasks. Perceived social presence related positively to participation in both learning environments and for both task difficulty levels. Task difficulty level did not have a major impact on student participation in either learning environment. This study suggests that the stronger the social presence, the more likely that accounting students will participate when using GSS.

Distance learning, an instructional method in which teachers and students are physically separated from each other during a majority of the learning process (Barker & Holley, 1996), is growing in popularity among business schools (Albrecht & Sack, 2000). According to the Association to Advance Collegiate Schools of Business (AACSB, 1999), an accreditation agency for business administration and accounting degree programs, distance learning is growing so rapidly that the U.S. Department of Education cannot even provide up-to-date statistics on the number of distance learning programs.

Pedagogy is changing with the growth of distance learning programs. As stated by Milton R. Blood, AACSB managing director and director of accreditation, "...technology is transforming much of the pedagogy for campus-based learning" (AACSB, 1999, p. 1). At the same time that the delivery method in business education is changing, business professionals have expressed a strong concern over the quality of pedagogy in business education. For example, in the early nineties, an accounting task force, known as the Accounting Education Change Commission (AECC), recommended major changes to properly prepare business students for the growing complexity of the business environment. The task force expressed

particular concerns about accounting principles courses, the introductory accounting classes required of all business majors. They asked accounting educators to find ways to engage accounting principles students actively, rather than passively, in the learning process (Accounting Education Change Commission, 1990; Hite, 1996). Part of the recommendations made by the AECC encouraged instructors to integrate collaborative learning projects into the curriculum.

The request for change in accounting education is as strong today as it was in the nineties. Educators are still urging accounting instructors to put less emphasis on lecturing and to place more emphasis on active learning activities (Albrecht & Sack, 2000).

Researchers have revealed that student interest and participation increases in an active learning environment as opposed to a passive one (Meyers & Jones, 1993). Students become more involved in the learning process because teachers are no longer the major transmitters of knowledge; that is, teachers do not lecture during active learning

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exercises. Various types of active learning exercises are available to business educators, including collaborative learning projects, simulations, case studies, and role playing (Meyers & Jones, 1993).

Collaborative learning is an active learning method that has demonstrated positive effects in the classroom. Researchers have found that students participate more during collaborative learning exercises (Feather, 1998; Johnson & Johnson, 1994) and, therefore, become more actively involved (Meyers & Jones, 1993).

An abundance of research is available on the effects of collaborative learning in the traditional, face-to-face learning environment. Only a few researchers, however, have examined the collaborative learning process in the less traditional, distance-learning environment (Burke, 1994; Chidambaram, Bostrom & Wynne, 1990).

Due to advances in technology, a multitude of options are available to educators in delivering distance-learning courses. Video conferencing is an attractive delivery method in distance-learning courses because it can transmit both video and audio images in real time (i.e., synchronous) and delayed time (i.e., asynchronous). As a result, video conferencing replicates the traditional classroom more closely than other types of technology. In fact, research has demonstrated that video-conferencing learners perceive social presence to be stronger than when using other types of technology. Social presence, the degree to which a person is perceived as a real person in mediated communication (Gunawardena & Zittle, 1997), is an important aspect of interaction, especially in distance-learning environments. The ability of the technology to convey important social context cues and nonverbal cues strengthens perceptions of social presence (Gunawardena & Zittle, 1997; Short, Williams & Christie, 1976).

Despite the advantages of video conferencing, other types of technology may be more appropriate for certain pedagogical activities for several reasons. First, due to technological limitations, information may be transmitted at a slower speed and in a jerky form in video conferencing, thus slowing down the continuity of conversation (Filipczak, 1995; Graves & Noll, 1999). Additionally, video conferencing currently does not offer groups the structure that is needed during group activities, an obstacle for

distance learners trying to collaborate with each other to work on a group project. Group support systems (GSS), however, are computer mediated communication (CMC) tools that provide structured support to both face-to-face and dispersed meeting groups (O'Connor, Bronner, & Delaney, 1996). Although most GSS are text-based communication tools, researchers have found that the sophisticated features of GSS (e.g., parallel input, anonymity) have positive effects on collaborative work. For example, if a group of four accounting students is working on a problem that requires the generation of three probable causes for declining net income, individual students would simultaneously enter their responses to the problem. The ideas entered privately by each student would be displayed on the public workplace (i.e., a large screen) at the same time. If each student entered three possible solutions to the problem, the group would be able to review twelve possible solutions via the public workplace. This parallel input feature, along with the anonymity of the comments, has been found to reduce communication barriers among group members, resulting in increased generation of ideas (Caouette & O'Connor, 1998; Dennis & Gallupe, 1993).

Examining participation in a face-to-face environment, researchers have found that members of GSS (face-to-face) supported groups participated more during the problem solving process than the non-GSS (face-to-face) groups (Briggs, Ramesh, Romano, & Latimer, 1994-95; Gallupe, 1985; Gallupe, DeSanctis & Dickson, 1988; Lewis, 1982; Lim & Benbasat, 1996/1997; Nunamaker, Briggs, Mittleman, Vogel & Balthazard, 1996-1997; O'Connor et al., 1996; Steeb & Johnston, 1981; Vogel, Nunamaker, Martz, Grohowski & McGoff, 1989-90). Researchers have also compared the effectiveness of GSS for simple versus difficult tasks, but findings have not been consistent. Some researchers have reported no significant differences in participation between simple and difficult tasks (Gallupe, 1985; Johnson, 1997), while others have found GSS to have a more positive impact on students solving complex tasks as compared to simple tasks (Dennis & Gallupe, 1993; Dennis, Nunamaker & Vogel, 1990; Zigungs & Buckland, 1998).

Most of the researchers, however, who have examined the effectiveness of GSS for group projects focused only on face-to-face group environments with and without GSS. Since most GSS lack audio and video capability, a substantial decrease in social context cues (e.g., nonverbal communication) occurs in a GSS distant learning environment. As a result of the decrease in social context cues, individuals tend to feel distant from each other (Kiesler & Sproull, 1992). Researchers have demonstrated that social presence has been significantly stronger in GSS face-to-face learning environments as compared to GSS distant learning environments (Burke & Chidambaram, 1996; Chidambaram & Jones, 1993).

Since most research on social presence has examined social presence in the traditional (i.e., face-to-face) learning environment, more research is needed to understand the importance of social presence in the distant learning environment. This article, consequently, compares the amount of participation during an accounting task, as well as the degree of perceived social presence, in a face-to-face GSS learning environment versus a distant GSS learning environment for both a simple and a difficult accounting task. Additionally, the article examines how the relationship between social presence and amount of participation varies with type of learning environment and task difficulty. It also considers the effects of the accounting background, age, and gender of accounting students, variables that have been shown to influence both social presence and amount of participation (Blocher, 1997; Huston, 1997).

Hypotheses

1. When working on a simple or difficult collaborative accounting task, there will be no significant difference in the degree of social presence perceived by accounting students in a face-to-face versus a distant GSS learning environment.
2. When working on a simple or difficult collaborative accounting task, there will be no significant difference in the amount of participation of accounting students in a face-to-face versus a distant GSS learning environment.
3. When working on a simple or difficult collaborative accounting task in a face-to-face or distant GSS learning environment, there will be no significant difference in the amount of participation of accounting students between those with perceptions of very high social presence as compared to those with perceptions of high, low, and very low social presence.

Prior Research

Social Presence

Social presence is defined as the extent to which an individual is thought of as being real during computer-mediated communication. Stated differently, it has been referred to as the degree to which individuals perceive the others as being physically present during the communication process (Blocher, 1997; Short et al., 1976). Two major concepts related to social presence are Argyle and Dean's (1965) concept of intimacy and Wiener and Mehrabian's (1968) concept of immediacy (see Gunawardena, 1995; Short et al., 1976).

Nonverbal cues contribute to perceived social presence. Examples of such cues include physical distance, facial expressions, eye contact, body position, and intimacy of topic (Argyle & Dean, 1965; Burgoon, Buller, Hale & DeTurck, 1984; Short et al., 1976).

Researchers have emphasized the importance of social presence in a learning environment (Short et al., 1976). Social presence is positively related to academic performance (Christophel, 1990; Kearney, Plax & Sorensen, 1988) and satisfaction (Boverie, Murrell, Lowe, Zittle, Zittle & Gurawardena, 1997; Gunawardena, 1995; Gunawardena & Zittle, 1997; Hackman & Walker, 1990). Furthermore, educators can influence the degree to which students perceive social presence in a classroom (Gunawardena, 1995; Gunawardena & Zittle, 1997; Kearney, Plax & Wendt-Wasco, 1985). Thus, social presence is an important factor to consider in distance learning classes.

Group Support Systems

Group support systems are defined by DeSanctis and Gallupe (1987) as integrated computer-based

systems that facilitate the solution of semi-structured or unstructured group problems. According to Vogel and Nunamaker (1990), GSS have been acknowledged as supporting group processes, such as the generation of alternative ideas, sharing of ideas, communication, planning, negotiation, problem solving, consensus building, and decision making, in both face-to-face and dispersed business meeting environments.

Most researchers to date have examined the use of GSS in a same time, same place environment (i.e., face-to-face) (Bamber, Hill & Watson, 1995; Briggs et al., 1994-1995; Feather, 1998; Gallupe, 1985; Johnson, 1997; Lim & Benbasat, 1996/1997; Nunamaker et al., 1996-1997; Caouette & O'Connor, 1998; Vogel & Nunamaker, 1990). Researchers have found that GSS provides support to group processes in various ways, such as removing communication barriers and providing structure to the decision making process (DeSanctis & Gallupe, 1987).

In most studies on GSS, researchers have compared the performance of traditional face-to-face learning environments (i.e., no GSS) with GSS face-to-face learning environments. However, some researchers have also examined the use of GSS in a distant learning environment. For instance, Siegel, Dubrovsky, Kiesler and McGuire (1986) found that GSS distant groups made significantly fewer comments and took significantly more time to reach a group decision than face-to-face groups.

In another study, Burke and Chidambaram (1996) compared the effects of three different GSS meeting environments—face-to-face, dispersed synchronous (same time, different place), and dispersed asynchronous (different time, different place)—on group processes and academic performance (quality of final project) and found that the business students in the dispersed synchronous groups performed significantly better than the face-to-face groups. Furthermore, face-to-face groups reported significantly higher levels of social presence than did the other two groups throughout the four sessions. Results suggest that social presence is not related to academic performance, which contradicts research conducted in a traditional learning environment (Christophel, 1990; Kearney et al., 1988; Short et al., 1976). The researchers, however, did not measure amount

of participation, which could be considered another measure of performance in a classroom.

A review of the literature has demonstrated that there has been an abundance of research on the effectiveness of GSS to support group processes in a traditional, face-to-face environment. Research on the use of GSS in a distant synchronous learning environment is limited, however. Thus, this study builds and expands upon the contributions already made by researchers on GSS. With the growing popularity of distance learning in business education, educators must understand more about the effects of GSS in a distant versus a face-to-face learning environment for a collaborative accounting task.

Methodology

This experimental study examines how the type of learning environment (GSS face-to-face vs. GSS distance) and level of difficulty of an accounting task (simple vs. difficult) influences the amount of participation by accounting students as they work together on a collaborative accounting task. Furthermore, this study examines differences in perceived social presence for both learning environments and both task difficulty levels to determine if the relationship between social presence and amount of participation varies with the type of learning environment and task difficulty. The amount of participation is measured by the number of entries entered into the computer by an individual that relate to the content of the accounting task. As part of the experimental design, three variables act as control variables: accounting background (number of accounting classes taken), age, and gender.

The researcher collected data on two consecutive days at a four-year private university. The researcher recruited 128 volunteer students from this university. The setting for the study was an office building equipped with a computer lab containing 23 computers arranged in a U-shaped fashion. The students participated in the face-to-face GSS treatment in the lab, and in the distant GSS treatment in sixteen offices. Each student worked at a computer in the computer lab or in one of the administrative offices.

Technology

The students who participated in this study did not have any prior experience with the GroupSystems software. Consequently, students were trained during the first hour of the experiment. As part of the training session, students worked on a warm-up exercise.

Topic Commenter, a structured brainstorming tool, was the primary GroupSystems tool used in this study. Additionally, distant groups used the Electronic Brainstorming tool (an unstructured idea generation tool, see Figure 2) to support general discussions prior to solving the task. The face-to-face groups had a general discussion by communicating verbally without the use of GroupSystems.

Tasks

The researcher prepared two hypothetical business cases (Figure 3) for the accounting students to solve. The simple task required students to list internal control procedures that should be integrated into the operations of a new restaurant. The difficult task used in this study was a more detailed and complex case that required students to evaluate a given situation for its internal control weaknesses. The researcher developed the task using information from an exercise in Warren, Reeve and Fess (1999).

The researcher used the definition of task difficulty used by Gallupe et al. (1988), who define the difficulty of the tasks primarily as a relative concept in that the difficulty level of any task can

Figure 2: GroupSystems V Features

BASIC TOOLS

BRIEFCASE

Briefcase is a set of memory-resident utilities that can be "popped-up" for use at any time, including when you are using a tool. They provide a supportive environment for the use of the other tools. Briefcase tools include File Reader, Note Pad, Clipboard, Quick Vote, Mood Meter, Calendar, Calculator, Active Session Status, Printing and Editing Reports, and Clearing Station Data.

ELECTRONIC BRAINSTORMING

Electronic Brainstorming is an unstructured idea generation software tool that allows participants to share ideas on a specific issue or question. Once a participant enters an idea, it is electronically passed to another participant, who may add to that line of thought or begin a new idea.

CATEGORIZER

Categorizer is used to organize the output from another tool, usually Electronic Brainstorming, into categories. After the final list of categories is generated by the group, comments from the report or file selected can be attached to these categories.

VOTE

Vote consists of three phases: ballot initialization, individual voting, and the collection of voting ballots. It is used to cultivate group consensus and to identify areas of differing opinions.

TOPIC COMMENTER

Topic Commenter is an idea generation tool that utilizes more structure than Electronic Brainstorming. You enter a list of topics, which are presented to participants in a multi-window format resembling file folders. Participants can respond to any or all of the topics in whatever order they desire.

GROUP DICTIONARY

Group Dictionary is used to build a repository for agreed-upon terminology by defining a list of terms or phrases. You enter a list of terms and send it to participants. Participants enter definitions for each term on the list and send them back to you.

ALTERNATIVE EVALUATION

Alternative Evaluation allows participants to rate a list of alternatives against a list of criteria, one at a time. Once you collect all the ratings from participants, you can view the group results in a variety of formats, including text reports of graphic representations. The results can then be discussed to help determine the optimal alternative for implementing an action plan or making a decision.

POLICY FORMATION

Policy Formation is a text-editing tool for developing a final statement, such as a policy or mission, through iteration and group consensus. You send an initial draft to participants, who rewrite the statement and send it back to you. These responses can be presented to the group for discussion, then sent back to participants for further revisions. This process is repeated until the statement is refined and agreed upon.

Figure 2: GroupSystems V Features (Continued)**ADVANCED TOOLS****IDEA ORGANIZATION**

Idea Organization includes all of the functionality of Categorizer, in the Basic Tool set, as well as options that make it a powerful multi-purpose tool that can be customized for a wide variety of tasks. It is especially useful in two common group activities: categorizing comments and generating a list of ideas.

GROUP OUTLINER

Group Outliner is used for generating ideas. Participants comment on topics in an outline structure that you prepare prior to the session. Group Outliner can be used to organize these ideas.

QUESTIONNAIRE

Questionnaire elicits participant responses on various types of information during a session. Questionnaire provides a systematic means of gathering data from participants that can be used in many ways.

STAKEHOLDER IDENTIFICATION

Stakeholder Identification offers a comprehensive means of testing the practicability of a plan. By identifying those who affect and are affected by the plan, their assumptions about the plan and whether those assumptions support, resist, or are neutral to the plan, potential problems with the plan's implementation can be addressed.

GROUP WRITER

Group Writer is an editing tool that allows members of a small group to work simultaneously on the same document. Only one participant at a time can work on a section of the document, although the section can be viewed by all. When a participant finishes working with the section, it becomes available for editing and annotation by other group members.

GROUP MATRIX

Group Matrix allows participants to establish relationships between two sets of items in a matrix format. It displays which cells of the matrix represent a consensus among the group.

Source: Feather, 1998.

only be assessed with respect to other tasks. Gallupe and his colleagues refer to task difficulty as the amount of mental effort (i.e., cognitive load) required to identify a solution to a problem.

To validate the task difficulty level, the tasks were field tested with thirty students in a pilot study. Additionally, a panel of three experts evaluated the tasks to assess their face and content validity and, most specifically, the validity of the task difficulty. The criteria for selecting the panel of experts were that each member had to (1) possess a Ph.D. in either accounting or business education, and (2) have full-time experience teaching accounting principles courses at the undergraduate level. Both the pilot study and analysis by the three experts confirmed the researcher's classification of each task (i.e., simple versus difficult).

Computer Transcripts

The computer transcripts generated for each GroupSystems session contain records of all

electronic discussions among the individual groups. In order to measure the amount of participation in this study, the GroupSystems software displayed each student's identification number automatically immediately after he or she entered new text.

To be consistent with previous research, the data include only the number of comments entered that related to the content of the problem (Briggs et al., 1994-95; Yellen, Winniford & Sanford, 1995). Thus, questions or comments about the software program, group processes, or other non-task related problems were not counted (Yellen et al., 1995).

Research Design

The author analyzed the data from this experimental study using ANCOVA in a 2 x 2 factorial design and a 2 x 2 x 4 factorial design. Because the social presence instrument reports average scores, the author categorized this variable by quartile so that it could be used for testing hypothesis 3.

Figure 3: Collaborative Accounting Tasks—Simple Versus Difficult

A. Simple Task

SARAH LEE OPENS A DINER

Sarah Lee is ready to open up a new diner that will be called the Samonello Diner. Sarah has a budget to hire up to 6 full time employees. She knows she needs at least one cook, waiter (or waitress), cashier and an accountant. Sarah is unsure about what she can do to set up a good internal control system in her company. However, her accountant friend told her that a good internal control system is necessary in order to “safeguard her assets” and “enhance the accuracy and reliability of the accounting records.” The friend specifically warned her to “protect her cash and food.” Unfortunately, Sarah’s friend is out of town on business and cannot assist Sarah in designing an internal control system. Sarah has asked your group to help her by providing her with a list of internal control procedures that she can implement in order to have a good internal control system. Sarah explained to you that she is unsure what should be done but that she has heard about other restaurants having many problems with sales not being entered into the cash register, employees stealing food and cash, employees giving free meals to friends, fictitious sales being recorded, and the restaurants being robbed. Sarah has also heard that problems can arise with the purchasing and receiving of supplies and food. She would like you to come up with as many ideas as possible for designing an internal control system in order to prevent these problems and other potential problems from occurring. Sarah is paying your group to generate as many ideas as possible.

INSTRUCTIONS:

Following are the six internal control principles along with information about each principle. For each principle, use TOPIC COMMENTER to list as many procedures as you can think of that Sarah can implement to follow the principle. For example, one of the principles of internal control is *physical, mechanical, and electronic controls*. An example of a procedure that Sarah can implement to follow the principle of *physical, mechanical, and electronic controls* is to install an alarm in her restaurant. Another principle of internal controls is *documentation procedures*. An example of a procedure that Sarah can implement to follow the principle of *documentation procedures* is to require a bill for payments made.

Generate as many ideas as you can!!!!

IMPORTANT: When using Topic Commenter, make sure to hit ENTER after each separate idea/comment/answer!!!!!!

1. Establishment of Responsibility

Assignment of responsibility to specific individuals so if something goes wrong, you know who should be held accountable. When assigning responsibility, one should assign a specific task to only one individual. Example: only one employee in a bookstore should be responsible for inspecting newly delivered merchandise (e.g. to make sure the correct number of books was delivered) for a specific order.

(Hint: refer to page 282 of your text for information about this principle)

2. Segregation of Duties

a. Responsibility for related activities should be assigned to different individuals (example: an employee that works in a bookstore should not be responsible for the activity of ordering new books and paying the bills for those books)
b. Responsibility for the physical custody of an asset (e.g. cash in a cash register) should be separated from the responsibility of the record-keeping for that asset (e.g. recording cash sales)

(Hint: refer to page 282 of your text for information about this principle)

3. Documentation Procedures

Evidence should be provided that transactions and events have occurred.

(Hint: refer to page 283 of your text for information about this principle)

4. Physical, Mechanical, and Electronic Controls

Physical controls should be used to safeguard assets. Mechanical and electronic controls should be used to safeguard assets and enhance the accuracy and reliability of the accounting records.

(Hint: refer to pages 283 and 284 of your text for information about this principle)

5. Independent Internal Verification

Involves the review, comparison, and reconciliation of data prepared by one or more employees.

(Hint: refer to pages 284 and 285 of your text for information about this principle)

6. Other Controls

Miscellaneous controls used to safeguard assets and enhance the accuracy and reliability of accounting records.

(Hint: refer to page 285 and of your text for information about this principle)

Figure 3: Collaborative Accounting Tasks—Simple Versus Difficult (Continued)

B. Difficult Task
FAD FASHIONS

I. Overview

Fad Fashions is a retail store specializing in women's clothing. Bob Carey, the owner, is upset because his net income has dropped significantly since last year. Bob is positive that his net income should have *increased* significantly since last year because his store is much busier than last year. He thanks his employees for the increase in customers because a lot of their friends are coming to the store now.

Bob thinks his former accountant, Susan Jones, is not preparing the income statement properly. He knows Susan graduated, with a very high GPA, from a prestigious university. Bob is now thinking she cheated her way through school. A friend of his told him to make sure she is not listing drawings and liabilities on the income statement. However, Bob doesn't know anything about accounting. Furthermore, he is a "hands off" type of owner and does not like to get involved with the day to day operation of his company. He thinks he should find a new accountant but first decides to ask your group for advice. Bob told you to talk to the accountant if necessary, but to not believe what she tells you.

The Details:

Your group has met with Bob, his employees, and the accountant, and has reviewed the records of Fad Fashions. Following is the information that you have gathered:

1. The Accountant: Susan Jones, the accountant, received her MBA from an Ivy League school three years ago. She passed the CPA exam and worked for one of the Big Five accounting firms (one of the largest firms in the world) for three years. Susan left the firm to start her own practice. She is well respected by her clients and other accountants. Susan Jones has only been working for Bob for one year. You asked Susan why she thinks the profit has declined. She told you to review the Sales Returns and Allowances account—there has been a substantial increase since last year. Furthermore, Bob has been buying a lot more inventory since last year. Susan questioned Bob about this and he replied "Obviously I am selling more inventory." However, the sales revenue account has only increased a small percentage since last year. Susan told you that she tried talking to Bob about these problems on numerous occasions and he wouldn't listen to her. He thinks she was just looking to bill him for more money. In fact, Bob told Susan not to do any more work for him until he finds out what is wrong—and that he will call her when he wants her back. Susan's last comments to your group were:

"He doesn't realize that spending money where it counts can save him money and since he won't listen to me, I can't help him. I have not told him this yet, but I can't work for a client like this—if he doesn't shape up he will have *no choice* but to look for a new accountant."

2. The income statement: The sales returns and allowances account has indeed increased substantially since last year and inventory purchases are much higher than last year. Although Bob has stated that there are more customers, the sales revenues account has only increased slightly since last year. Sales prices, as well as cost of purchases, have remained relatively stable over the last two years.

3. Job responsibilities/store policies: Since there was no office procedure manual or organization chart for the company, your group had to interview the staff of Fad Fashions to find out the responsibility of each employee. There are three employees: Doug, Jane and Chris.

4. Doug, Jane and Chris: Doug, Jane and Chris work Monday to Saturday. They each get paid \$7.00 per hour. Doug and Jane work at cash register #1 and are responsible for ringing up sales. Chris works at cash register #2. In addition to ringing up sales, Chris is also in charge of returns. Additionally, Chris is required to inspect new merchandise when it arrives at the store to verify that the right amount is delivered and place it immediately on the racks.

All three employees took vacations each year. Last year, they all took a vacation together in order to share expenses (the store closes for one week each year). They rented a cottage in the country for one week. It was a fairly inexpensive trip, since they split the cost of the trip, were able to drive to the place and were able to cook food in the cottage. However, this year only Doug and Jane rented the cottage. They were upset because it cost more money than in the past. Chris has been under a lot of pressure and decided to take a vacation to Bermuda in order to "really get away from it all." Doug and Jane are concerned about Chris, because Chris has been very depressed lately. They recently asked Chris what was wrong and Chris replied: "I do not want to spend the rest of my life working for another person—I have always wanted to go into my own business and make a lot of money. This is just not how I planned to spend my life."

According to Doug and Jane, Chris has been buying many new things, such as new clothes and a new Porsche, "to make up for what is missing in life." They are concerned that Chris will go into debt.

Figure 3: Collaborative Accounting Tasks—Simple Versus Difficult (Continued)

5. Return Policy: The store established a new liberal return policy for the most recently passed holiday season and future holiday seasons in order to encourage gift purchases. Any item purchased during November and December may be returned through January 31, with a receipt, for cash or exchange. If the customer does not have a receipt, cash will still be refunded for any item under \$25. If the item is more than \$25, a check is mailed to the customer. Whenever an item is returned, Chris completes a return slip, which the customer signs. The return slip is placed in a special box. Bob Carey is supposed to visit the return counter approximately once every two hours to authorize the return slips. However, he is usually too busy and often doesn't do this. Chris has been instructed to place the returned merchandise on the proper rack on the selling floor as soon as possible—preferably immediately after the return. This year, returns at Fad Fashions have reached an all-time high. There are a large number of returns under \$25 without receipts.

INSTRUCTIONS:

In order to practice good internal control, a company should implement procedures to follow each of the six internal control principles that you learned about in Chapter 7. For example, if a company is constantly being robbed outside of business hours and it does not have an alarm, one can say that an internal control weakness for that company is that the principle of *Physical, Mechanical, and Electronic Controls* is not being followed adequately. One way to improve this weakness is to install an alarm.

PART A. What internal control weaknesses, if any, exist for Fad Fashions under each of the following internal control principles? Use the Topic Commenter tool to answer this question. Your answers/comments are to go into the “weakness” categories that appear in Topic Commenter. You should list as many weaknesses as you can identify.

NOTE: You are to list only the WEAKNESSES in this part of the question. In the next part of the question (PART B) you will be asked to list your suggestions for improvement.

List as many weaknesses as you can!!!!

IMPORTANT: When using Topic Commenter, make sure to hit ENTER after each separate idea/comment/answer!!!!!!

A1. Establishment of Responsibility (Weaknesses)
(Hint: refer to page 282 of your text for information about this principle)

A2. Segregation of Duties (Weaknesses)
(Hint: refer to page 282 of your text for information about this principle)

A3. Documentation Procedures (Weaknesses)
(Hint: refer to page 283 of your text for information about this principle)

A4. Physical, Mechanical, and Electronic Controls (Weaknesses)
(Hint: refer to pages 283 and 284 of your text for information about this principle)

A5. Independent Internal Verification (Weaknesses)
(Hint: refer to pages 284 and 285 of your text for information about this principle)

A6. Other Controls (Weaknesses)
(Hint: refer to pages 285 and of your text for information about this principle)

PART B. What procedures should be implemented to improve the internal control for each internal control principle? You should list as many ideas as you have. Use the Topic Commenter tool to answer this question. Enter your answers/comments in the “improvements” categories that appear in Topic Commenter.

List as many ideas as you can!!!!

IMPORTANT: When using Topic Commenter, make sure to hit ENTER after each separate idea/comment/answer!!!!!!

- B1. Establishment of Responsibility (Improvements)
- B2. Segregation of Duties (Improvements)
- B3. Documentation Procedures (Improvements)
- B4. Physical, Mechanical, and Electronic Controls (Improvements)
- B5. Independent Internal Verification (Improvements)
- B6. Other Controls (Improvements)

Treatment A included the two types of learning environment, distant GSS and face-to-face GSS. Treatment B included the two levels of task difficulty, simple and difficult. Therefore, there were four treatment combinations. Each student participated in only one of the four treatment conditions.

The two independent variables in this study were learning environment and task difficulty. The 2 x 2 x 4 design includes an intervening variable, social presence, to examine its interaction with the two treatments. The participants' accounting background (the number of accounting courses taken), age, and gender were control variables. The dependent variable in the 2 x 2 factorial design was perceived social presence and the dependent variable in the 2 x 2 x 4 factorial design was the amount of individual student participation during a collaborative accounting problem-solving process.

Limitations

This study has certain limitations. First, the sample of this study is limited to students who took at least one accounting course and further limited to solving an accounting task. Therefore, additional studies could be conducted to determine if the results can be generalized to a broader range of samples and tasks.

Due to time constraints, the researcher was not able to assess the keyboarding skills of the students and thus could not statistically control for this variable. It is certainly possible that differences in ability and comfort levels with keyboarding could have affected the amount of participation of the students. However, random assignment of the students to the experimental conditions should have minimized the variation resulting from differences in keyboarding skills.

It was also beyond the scope of this study to assess how preexisting relationships among classmates or friends, or simply the knowledge that the students attended the same university, might impact perceptions of social presence among the distant learning groups. Since intimacy contributes to social presence, it is very possible that such preexisting relationships could impact perceptions of social presence. Therefore, additional studies could be conducted to determine whether the

results of this study could be generalized to a distant learning class where students do not know any of the other students in the class. Many colleges and universities offer distant learning classes to students who normally attend classes in a traditional face-to-face environment; thus the results of this study still offer practical significance even if preexisting relationships do impact perceptions of social presence. However, the chance of students being in groups where they had preexisting relationships was minimized through random assignment.

Data Analysis

To reconfirm the reliability of the Social Presence instrument, the researcher measured the internal consistency of the Social Presence instrument. Results yielded a Cronbach's alpha coefficient of .78, an acceptable level of reliability (Nunnally, 1978).

Social presence was then categorized into the following quartiles: first quartile, very low social presence; second quartile, low social presence; third quartile, high social presence; fourth quartile, very high social presence.

Analysis revealed that the scores on the two dependent continuous variables, social presence and amount of participation, were normally distributed. Additionally, accounting background, a continuous variable being treated as a covariate, was also normally distributed.

Findings

Hypothesis 1

When working on a simple or difficult collaborative accounting task, there will be no significant difference in the degree of social presence perceived by accounting students in a face-to-face versus a distant GSS learning environment.

The null hypothesis is rejected. When working on a simple or difficult collaborative accounting task, there was a significant main effect for learning environment [$F(1, 128) = 7.437, p = .007$] such that those in the face-to-face condition experienced a greater degree of social presence ($\bar{M} = 4.51$) than did those in the distant condition ($\bar{M} = 4.01$) (see

Tables 1 and 2). Data in Table 1 present the means and standard deviations and data in Table 2 present results of the ANCOVA.

Hypothesis 2

When working on a simple or difficult collaborative accounting task, there will be no significant difference in the amount of participation of accounting students in a face-to-face versus a distant GSS learning environment.

The null hypothesis is rejected. There was a significant main effect for learning environment [$F(1, 128) = 6.368, p = .013$] such that those in the face-to-face GSS learning environment ($M = 19.58$) participated more than did those in the distant GSS learning environment ($M = 14.50$) (see Tables 3 and 4). These findings were the same regardless of whether the accounting students solved a simple or difficult accounting task.

Hypothesis 3

When working on a simple or difficult collaborative accounting task in a face-to-face or distant GSS learning environment, there will be no significant difference in the amount of participation of accounting students between those with perceptions of very high social presence as compared to those with perceptions of high, low, and very low social presence.

Null hypothesis 3 is rejected. When working on a simple or difficult collaborative accounting task, there was a significant main effect [$F(3, 128) = 2.88, p = .039$] for social presence. That is, the amount of participation of accounting students differed significantly between those with perceptions of very high social presence ($M = 17.26$) as compared to those with perceptions of high ($M = 20.70$), low ($M = 16.45$), and very low social presence ($M = 14.31$) (see Tables 4 and 5). These findings were the same regardless of which accounting task (simple or difficult) the students worked on and regardless of which learning environment the

accounting students worked in (face-to-face or distant GSS).

A post hoc analysis for hypothesis 3 determined which categories of social presence were

Table 1: Perceived Social Presence Scores—Means and (Standard Deviations) (N= 128)

Type of Accounting Task		Type of GSS Learning Environment		
		Face-to-Face	Distant	Total
Simple	<u>M</u>	4.60	4.27	4.44
	<u>SD</u>	(0.87)	(1.02)	(0.95)
Difficult	<u>M</u>	4.42	3.74	4.08
	<u>SD</u>	(1.11)	(0.93)	(1.07)
Total	<u>M</u>	4.51	4.01	4.26
	<u>SD</u>	(0.99)	(1.00)	(1.02)

Table 2: Analysis of Covariance of Perceived Social Presence (N= 128)

Sources of Variation	Degrees of Freedom	Sum Of Squares	Mean Square	F Value	p
Variables:					
Accounting Background (covariate)	1	0.444	0.444	0.457	.501
Age (covariate)	1	0.724	0.724	0.745	.390
Gender (covariate)	1	1.175	1.175	1.209	.274
Learning Environment	1	7.227	7.227	7.437	.007*
Task	1	3.582	3.582	3.686	.057
Learning Environment x Task	1	0.987	0.987	1.016	.316

*Significant at the .05 level.

Table 3: Amount of Participation—Means and (Standard Deviations) (N= 128)

Type of Accounting Task	Type of GSS Learning Environment		
	Face-to-Face	Distant	Totals (Face-to-Face & Distant)
Simple	18.44	13.84	16.14
	(7.17)	(7.25)	(7.52)
Difficult	20.72	15.16	17.94
	(8.29)	(7.92)	(8.52)
TOTAL	19.58	14.50	17.04
	(7.77)	(7.56)	(8.05)

Table 4: Analysis of Covariance of Amount of Participation (N= 128)

Sources of Variation	Degrees of Freedom	Sum Of Squares	Mean Square	F Value	p
Variables:					
Accounting Background (covariate)	1	394.038	394.038	7.385	.008*
Age (covariate)	1	31.082	31.082	0.583	.447
Gender (covariate)	1	243.905	243.905	4.571	.035*
Learning Environment	1	339.782	339.782	6.368	.013*
Task	1	52.237	52.237	0.979	.325
Social Presence Quartile	3	461.672	153.891	2.884	.039*
Learning Environment x Task	1	70.239	70.239	1.316	.254
Learning Environment x Social Presence Quartile	3	152.483	50.828	0.953	.418
Task x Social Presence Quartile	3	9.771	3.257	0.061	.980
Learning Environment x Task x Social Presence Quartile	3	182.446	60.815	1.140	.336

*Significant at the .05 level

significantly different from each other for the dependent variable, amount of participation. The Scheffé test revealed a significant difference ($p = .014$) between very low social presence and high social presence (see Table 6). Participation was significantly higher in the high social presence category than in the very low social presence category.

Although gender was not a major variable of interest in this study, the researcher conducted an ancillary analysis to explore the relationship between gender and amount of participation. This step involved conducting an additional ANCOVA for the dependent variable, amount of participation, treating learning environment, task, gender, and social presence as independent variables, and accounting background and age as control variables. The ANCOVA analysis revealed that the gender and social presence category had a significant interaction effect [$F(3,128) = 2.71, p = .049$] for the dependent variable, amount of participation. Examining the data reveals that females whose perceptions of social presence fell in the two extreme categories—“very high” and “very low,” participated more than males. However,

females whose perceptions of social presence fell in the two more moderate categories, “high” and “low,” participated slightly less than males. This difference in amount of participation between females and males was most notable for the very high and the very low social presence categories; the average participation score for females was higher than that of males by 5.59 in the “very high” category, and by 5.55 in the “very low” category (see Table 7). The difference in amount of participation between females and males for the “high” and “low” social presence categories was much smaller and showed,

in contrast, that the males participated more than the females. The average participation score of males was higher than that of females by 0.26 in the “high” category, and by 2.80 in the “low” category (see Table 7).

Accounting background, as measured by the number of accounting classes taken, was not a variable of interest in this study. However, since the subjects had different accounting backgrounds

Table 5: Amount of Participation x Degree of Social Presence—Means and (Standard Deviations) (N= 128)

Degree of Social Presence	Amount of Participation
Very High	17.26 (8.97)
High	20.70 (7.84)
Low	16.45 (7.08)
Very Low	14.31 (7.27)
TOTAL	17.04 (8.05)

Table 6: Scheffé Test for Multiple Comparisons of Degree of Social Presence and Participation

(I) Social Presence Quartile	(J) Social Presence Quartile	Mean Difference (I-J)	p
very low	low	-2.1461	.739
	high	-6.3944*	.014
	very high	-2.9525	.499
low	very low	2.1461	.739
	high	-4.2484	.216
	very high	-0.8065	.983
high	very low	6.3944*	.014
	low	4.2484	.216
	very high	3.4419	.400
very high	very low	2.9525	.499
	low	0.8065	.983
	high	-3.4419	.400

*Significant at the .05 level

and worked on an accounting task, the researcher controlled for this variable. The ANCOVA analysis (Table 4) confirmed that this variable would in fact significantly impact the results [$F(1,128) = 7.385$, $p = .008$] had it not been controlled for in the study.

The researcher also examined the data to determine if attitude toward computers was related to participation or social presence. Most participants expressed favorable attitudes toward computers, so there was very little variability in participants' computer attitudes. Eighty-nine percent ($n = 114$) expressed a favorable attitude toward computers, 6% ($n = 8$) indicated a neutral attitude toward computers, and the remaining 5% ($n = 6$) expressed negative attitudes towards computers.

Discussion

Consistent with the findings of Burke and Chidambaram (1996), the degree of social presence perceived by accounting students was significantly higher in the GSS face-to-face setting than in the GSS distant learning environment. The same finding applied to both the simple and the difficult collaborative accounting task. These significant

findings are supported by Short's concept of social presence (1976). Since no audio or video support was offered to the subjects in the distant GSS learning environment, nonverbal and social context cues were missing. The lack of such cues between individuals who are communicating with each other may lead to feelings that the environment is cold and unsociable—that the environment lacks social presence (Fabro, 1996).

The amount of participation was also significantly greater in the face-to-face GSS setting than in the distant GSS learning environment. This was true for both the simple and difficult accounting task. This suggests that students participate more in an environment of higher perceived social presence than in one of lower perceived social presence. This is consistent with the findings of previous researchers that higher degrees of social presence have a more positive impact on student learning than do lower degrees of social presence (Boverie et al., 1997; Christophel, 1990; Gunawardena & Zittle, 1997; Hackman & Walker, 1990). Likewise, Siegel et al. (1986) found that students participated more in a traditional face-to-face setting, as compared to a distant GSS learning environment. Again, since face-to-face learning environments have been found to foster higher degrees of social presence than distant learning environments (Short et al., 1976), these results further support the hypothesis that students participate more in environments of higher social presence. This study supports the findings of previous studies that indicate the importance of

Table 7: Amount of Participation—Interaction of Participants' Gender x Perceived Social Presence Scores—Means and (Standard Deviation) N= 128

Gender	Perceived Social Presence Score Categories				Total
	Very High	High	Low	Very Low	
Female	19.42 (8.51)	20.59 (8.57)	15.37 (7.40)	16.00 (7.43)	17.64 (8.08)
Male	13.83 (8.94)	20.85 (7.12)	18.17 (6.49)	10.45 (5.35)	16.04 (7.98)
Total	17.26 (8.97)	20.70 (7.84)	16.45 (7.08)	14.31 (7.27)	17.04 (8.05)

social presence in the learning process. Most specific to this study, social presence is an important variable during the collaborative accounting problem solving process.

The amount of participation also significantly differed for two of the four categories of social presence: very low social presence versus high social presence. Those accounting students working collaboratively on an accounting task who reported perceptions of social presence that fell in the high category, the second to highest category, participated significantly more than did those whose reported perceptions of social presence fell in the very low category, the lowest category. It is possible that in the very high category, the perceived social presence was so high that it may have reduced the students' focus on the task and, thus, their participation was not significantly higher than that of students in the lower social presence categories. Apparently, in the high social presence category, an optimal level of social presence was perceived, which fostered participation (Short et al., 1976). An alternative reason for finding significant differences between only two of the four categories is the manner in which the social presence variable was treated. As this continuous variable was categorized into four categories, a substantial amount of variance may have been lost, resulting in a finding of nonsignificant differences even when significant differences may actually exist (Kerlinger & Pedhazur, 1973).

Ancillary analysis revealed that for both learning environments and both accounting task difficulty levels, female students participated substantially more than males. However, such findings only existed for the two extreme degrees of social presence, "very high" and "very low." In the middle two social presence categories, "high" and "low," male accounting students participated slightly more than females. A possible explanation for this finding is that females place more importance than males on interpersonal relations, the physical environment, and building intimacy (Gefen & Straub, 1997). Intimacy is a component of social presence (Short et al., 1976). If individuals do not experience the desired level of intimacy, they will try to change their behavior so that the intimacy reaches the desired level (Short et al., 1976). Since females place importance on

intimacy, it is possible that those females who experienced very high degrees of social presence were energized by the high level of intimacy and thus participated more than males. At the other end of the spectrum, the females who experienced very low degrees of social presence possibly tried to compensate for the lack of intimacy by participating more in order to raise it to a higher, more preferred level. For the middle two categories of social presence, it is possible that the females were somewhat neutral to the level of intimacy experienced and may not have felt a need to alter it. Consequently, their participation levels were not as high as in the very low and very high social presence categories. This finding clearly raises important questions for future research.

Accounting background was found to have a significant impact on amount of participation. The researcher controlled for this variable in the study, and thus the significant finding confirms the study design to treat it as a control variable. While beyond the scope of this study, the finding certainly indicates that future researchers should, at minimum, control for academic background.

Recommendations

The results of this study help business educators to gain an understanding of how collaborative learning projects are affected by a distant learning environment. Accounting students did not participate as much in a distant learning environment, as compared to a face-to-face environment, during a collaborative accounting task. Thus, if business educators are planning to integrate group projects into a distance learning environment, they should be aware that participation by individual students or by the class as a whole may be less than in a face-to-face learning environment. By being aware that perceived social presence is strongly related to amount of participation, educators can and should seek ways to enhance such perceptions if the goal is to enhance participation. Additionally, since amount of participation appears to vary for females and males depending upon the degree of perceived social presence, educators should be aware that, if trying to foster perceptions of social presence, females and males might react differently. One suggestion would

be to vary the learning environments so that students have an opportunity to experience varying degrees of social presence. For instance, students could be required to work on a collaborative accounting project in a face-to-face GSS learning environment on one day and in a distant GSS learning environment on another day.

Furthermore, the results of this study indicate that GSS is, in fact, sophisticated enough to support both a simple and a difficult collaborative accounting task and, thus, can be used for varying levels of task difficulty. Business educators should take advantage of such technological tools.

The results of this study reveal a need for future research in several areas. A study should be conducted that includes not only GSS face-to-face and GSS distant synchronous learning environments, but also a GSS distant asynchronous setting. Asynchronous communication results in a delay of information between those communicating, and may affect perceptions of social presence, as well as the level of participation during a collaborative business task.

Future researchers could compare the academic performance of students after solving a collaborative accounting task in a GSS face-to-face versus GSS distant learning environment. To investigate cause and effect, researchers could measure perceptions of social presence to determine if, and how, it impacts academic performance and furthermore, how learning environments impact social presence.

Additionally, a study could be conducted to explore the relationship between amount of participation, gender, and perceived social presence. As part of this research, participants could be interviewed in order to gain additional understanding of why females and males react differently to varying degrees of social presence.

Future researchers could also examine how preexisting relationships among the subjects might impact perceptions of social presence among the distant learning groups. Alternatively, they could compare the perceptions of social presence in a distant learning class that is composed of students who attend the same college in a traditional face-to-face learning environment versus the perceptions of social presence in a distant learning class that is

composed of students who only attend college in a distant learning environment.

Conclusions

According to Mason and Kaye (1990), distance learners need more support than traditional face-to-face learners. The findings of this study support this claim if the objective of the business educator is to stimulate student participation during a collaborative task. Prior researchers have demonstrated that collaborative learning has positive effects in the classroom. One of these positive outcomes is an increased level of participation. If technology is used to support distance learning classes, it must be done in a way that, at minimum, equals the quality of face-to-face education. One way to help accomplish such an objective is to find ways to integrate collaborative learning projects successfully into the distance learning environment. The results of this study indicate that accounting students in the distant GSS learning environment did not participate as much during the problem-solving process. Thus, if the goal of an educator is to foster the participation of students during a collaborative project, social presence is a variable that should not be overlooked. Face-to-face communication has been found to foster the strongest degree of social presence; thus, measures should be taken to enhance social presence in the distant learning environment.

Another conclusion that can be drawn from this study's findings is that level of task difficulty (difficult vs. simple) does not have a major impact on the amount of participation of accounting students working on a collaborative accounting task in either a face-to-face or a distant GSS learning environment. Apparently, the GSS product used in this study was sophisticated enough to support both simple and difficult accounting tasks.

A last and important conclusion to be drawn from the results of this study is that males and females react differently to varying degrees of social presence. Females participated more than males, in both learning environments and both task difficulty levels, when they experienced very high or very low degrees of social presence, but participated slightly less than males when they experienced merely high

and low degrees of social presence. Thus, social presence and participant gender had a significant interaction effect on amount of participation. It is unclear why this difference occurred. Additional research could be done to further understand the finding that males and females react differently to varying degrees of social presence.

The findings of this study are important because they offer additional understanding of how and why participation of business students may vary between a GSS face-to-face and GSS distant learning environment. Distance learning is growing rapidly and accounting classes are included in this explosion. There has been an abundance of research on the advantages of collaborative learning projects in a face-to-face learning environment, both in a traditional and GSS setting. Because such research has indicated positive outcomes, the effects of collaborative learning exercises in the distance learning environment should also be closely examined. Furthermore, since perceived social presence has been found to be significantly different in a distant learning environment as compared to a face-to-face learning environment, and is related to participation levels, this study offers some theoretical understanding as to why differences in participation may occur.

The results of this study suggest that obstacles may exist in a distance learning environment if the goal of educators is to increase the involvement of business students in the learning process. Business is in need of graduates who will be prepared to work in a rapidly changing and challenging environment. Thus, business educators cannot lose sight of the importance of maintaining or surpassing the quality of education in a traditional learning environment. Active learning exercises, such as group accounting projects, should not be omitted from distance education.

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