Class Participation in Accounting Courses: Factors That Affect Student Comfort and Learning

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ABSTRACT: Class discussion is frequently used in accounting education. Prior research indicates that preparation for and frequency of participation in class discussion is positively related to students' comfort participating. This study extends this literature by examining the relationship between class participation and learning. In this study, 323 sophomore business students enrolled in accounting courses and completed pre- and post-course surveys concerning their perceptions about class discussion; in addition, instructors provided students' grades for our use in this study. Path model results indicate that preparation is positively related to frequency of participation, which, in turn, is positively related to students' comfort participating in class discussion. Furthermore, students' comfort participating in class discussion is positively related to learning. A practical implication of this finding on the learning-comfort relationship is that instructors' efforts to foster student comfort with class discussion—especially efforts directed at increasing their preparation and participation frequency—should lead to increased student mastery of course content.

Keywords: student learning; class discussion; comfort with class participation; participation frequency; student preparation.

Data Availability: Data used in this study are available upon request from the authors.

INTRODUCTION

Accounting practitioners and educators agree that, in addition to mastering accounting content, communication skill development is encouraged for accounting students (Stowers and White 1999; Albrecht and Sack 2000) because communication skills are critical to professional success (Albrecht and Sack 2000). Class discussion provides an opportunity to both learn accounting content and develop communication skills. Further, courses that grade class participation encourage students to participate in class discussions and engage more actively in their own learning (Dallimore et al. 2006). Such courses provide an appropriate setting for us to examine student comfort with class discussion, learning, and various factors that affect these variables.

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Recently, research has examined the use of an "active student-centered learning-based" approach, not only to examine the delivery of instruction, but also its design and evaluation (Lavoie and Rosman 2007). Such research is part of a research tradition focusing on instructional improvement, where educational philosophers and practitioners have advocated a shift away from a primary focus on teaching, toward greater emphasis on student learning (Barr and Tagg 1995; Bok 1988). A fundamental component of this shift has been a call for instructors to use strategies designed to actively engage students in the teaching-learning process (Bonwell and Eisen 1991; Nyquist and Wulff 1990, 1999). Class discussion is, perhaps, the most frequently used and most often-embraced strategy for creating an active and learning-based approach to instruction.

If discussion is a means to engage students in their own learning and, as suggested by some, to improve student performance and satisfaction (Bonwell and Eisen 1991), then students who are not actively involved in the class discussion or who do not volunteer, might have a lower-quality learning experience. Communication apprehension (e.g., Burk 2001) or more specifically, classroom apprehension, that is, the fear of communicating in a classroom context (Aitken and Neer 1993; Myers and Rocca 2001), could make a student uncomfortable and unwilling to engage in class discussion. While the Aitken and Neer (1993) study focuses on how "college student question-asking" is related to classroom apprehension, question-answering by students (e.g., student participation in class discussion) may also be important to our understanding of student comfort.

This study is designed to examine the relationship between factors associated with student comfort participating in class discussion and students' overall learning. The primary results indicate that overall learning is positively related to students' self-reported comfort with class discussion. Student comfort with class discussion, in turn, is positively related to two pre-course factors (typical frequency of participation in prior courses and liking of class discussion) and to four factors associated with the course in this study: typical level of preparation for class, frequency of participation in class discussion, the value of other students' comments for one's own learning, and the effect of the course on one's own oral communication skill development.

Our results make important contributions to the literature on discussion teaching. First, we demonstrate the important, positive relationship between comfort participating in class discussion and learning, and we do so using objective measures of learning rather than the more typically used student self-reported measures. This study provides empirical evidence to support the conventional wisdom, which tells us that participating in class discussion facilitates learning (Christensen 1991; Elmore 1991).

Second, our student comfort model expands the model of comfort with class discussion reported by Dallimore et al. (2006), which was based on a graduate accounting course using case discussion pedagogy. Further, it provides insight into the process through which participation in class discussion affects learning and a richer understanding of why participation in class discussion matters. It demonstrates how the participation of other students is important, and how participation contributes to the development of oral communication skills.

Knowing the relationship between class participation, comfort, and learning should encourage instructors to find ways to increase the participation of all students in class discussions. Instructors' efforts to foster student comfort with class discussion should lead to increased student mastery of course content. Especially important are efforts to increase students' preparation and to increase their participation frequency; instructors might consider a variety of strategies, including calling on students whose hands are not raised.

We begin by reviewing the literature on class discussion as a means for engaging students in their own learning. Next, we present our research hypotheses, methodology, and results, followed by our discussion and implications. After we acknowledge the limitations of this study and make suggestions about future research, we provide our concluding remarks.

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REVIEW OF LITERATURE
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Discussion Teaching

Researchers have articulated a variety of reasons for utilizing class discussion ranging from the philosophical to the practical (Christensen et al. 1991). This may be, in part, because the discussion method is one in which, as Ewens (2000, 21) summarizes, "the instructor and a group of students consider a topic, issue, or problem and exchange information, experiences, ideas, opinions, reactions, and conclusions with one another."

Davis (1993, 63) explains that "through discussion, students gain practice in thinking through problems and organizing concepts, formulating arguments and counter arguments, testing their ideas in a public setting, evaluating the evidence for their own and others' positions, and responding thoughtfully and critically to diverse points of view." Further, instructional developers suggest that, compared to the traditional lecture method, discussion elicits higher-level reflective thinking and problem solving, including application, analysis, synthesis, and evaluation, and that information learned through discussion is generally retained better than information learned through lecture (Ewens 2000). This is supported by research that links discussion (both face-to-face and online) more closely to "deep approaches" to learning—including reflection, analysis, and questioning—than to "surface" learning like hearing others' experiences or adding ideas (Ellis et al. 2006). Such skills are important to students majoring in business disciplines, including accounting, as they will need to be able to think through problems, organize concepts, analyze information, formulate arguments, synthesize and evaluate evidence, and respond to diverse points of view.

As Cooper (1995) and others argue, one advantage of utilizing class discussion is that students are active and are responsible for their own learning, and as Weaver and Qi (2005, 570) assert "students who actively participate in the learning process learn more than those who do not." Hertenstein (1991, 175) supports such a claim by explaining that discussion provides an opportunity for students to learn both "through their own active participation and through the contributions of others." Indeed, class discussion "creates a community of interest within the classroom in which students think of themselves as enabling each other's learning" (Elmore 1991, xv).

Students' typical role in a class discussion is that of listener, as "at any given moment, after all, all members of the group but one are engaged in listening" (Leonard 1991, 138). This creates a respectful climate that enhances students' comfort participating, as "the most obvious token of respect is attentive listening" (Leonard 1991, 146). When asked to explain why they are comfortable participating in a particular course, students respond that increased participation by themselves "their peers" is a significant reason (Souza et al. 2010, 242). One reason students' comfort participating is enhanced when listening to other students is because they relate to one another as peers. Christensen (1991, 109) explains:

> Students also tend to share the language system of their generation, a common idiom of "go" and "no go" words and relevant metaphors … This, plus their knowledge of fellow students brings them swiftly to the core of effective communication, speaking *to* not *at* one another. Equally important, it is simpler and less threatening for participants to check and recheck each other's meaning than for the instructor to do so … Correction of the inevitable miscommunication is less complicated when it comes from a classmate than a teacher (emphasis in the original).

Further, because it is easier to relate to and interact with one's peers, the student may be inclined to participate more frequently.

Finally, listening to and interacting with other students enhances the student's communication skills. According to Elmore (1991, xiv), complex social interaction is required for learning, including learning communication skills; for example, children learn language through social interactions with adults and other children. Leonard (1991, 139) recognizes that listening is a precious resource, suggesting that "good listening nourishes our ability to communicate the subtle nuances

of our own thoughts." Dallimore et al. (2008) argue that participating in class discussions helps students practice the transformation of ideas into words by developing, organizing, supporting, and presenting arguments; they find that the more frequently students participate in class discussions, the more they report improvement in oral communication skill development.

In the field of business, generally, and in the accounting area, specifically, references in the literature to class discussion are often focused on a specific type of class discussion: the case discussion. Gilmore and Schall (1996) find that case discussions are preferred to lectures when training potential leaders in business because they serve to enhance students' problem-solving skills. Case discussions have been advocated by business faculty because case discussion "calls for discussion of real-life situations that business executives have faced" (Hammond 2002, 1). Christensen and Hansen (1987, 16) contend that case discussions draw problems "from the complexity of real life," linking knowledge and application. Christensen and Hansen (1987, 24) further suggest that this pedagogy benefits students by enabling them "to discover and develop their own unique framework for approaching, understanding, and dealing with business problems," and by creating an environment where intellectual inquiry, risk taking, and new learning occur.

More specifically, in accounting, case discussions are considered to be an "extremely effective way to teach accounting" because they can "achieve the basic objectives that almost all instructors have for courses in accounting" (Bruns 2006, 1, 2), including demonstrating "the ways in which accounting is an information development and communication function" and preparing students "to obtain additional knowledge … [and to] facilitate subsequent learning." Case discussions and other forms of class discussion may be especially appropriate for management accounting courses where the student is not simply expected to apply a fairly well-defined rule to a situation, but must analyze a wide range of potential approaches and make appropriate decisions for each unique situation. However, despite apparent widespread use of various forms of class discussion in accounting,[1] there is little empirical evidence in the accounting literature on the outcomes or effectiveness of this pedagogy.

Voluntary Participation Does not Guarantee Involvement by All

Despite support for the use of discussion in teaching, not all students are equally likely to participate, which can limit the value of discussion for students (Brookfield and Preskill 1999). For example, Weaver and Qi (2005) review a variety of factors that constrain the active involvement of students in a number of ways (e.g., student preparation, student confidence or fear, class size, etc.).

Davis (1993) emphasizes the importance of encouraging all students to participate, and she even provides strategies for encouraging student participation in discussion (e.g., by using electronic mail). Scollon and Bau (1981) describe the importance of instructor expectations and efforts to increase participation. Fishman (1997) notes various techniques that enhance student participation in class discussion (e.g., study questions and response logs). Within the field of business, there are several references to soliciting nonvoluntary participation in an edited book about teaching and the case method (Christensen and Hansen 1987). Others make efforts to manage participation during discussions by assigning roles in discussions (Smith and Smith 1994) or utilizing technology—including online discussions or even complete course design and delivery (Arbaugh 2000; Bump 1990; Ellis et al. 2006). Bump (1990) finds that class discussion that uses networked computers leads to greater student participation and increases involvement by less frequent participators.

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[1] Use of discussion in accounting courses is suggested by the fact that accounting education journals publish numerous accounting cases and other instructional resources designed to elicit class discussion. In addition, university case collections, such as those published by Darden, Harvard, and Ivey, also include numerous accounting cases.

More recently, however, research in accounting education has been mixed. For example, Cunningham (2008) links the use of student response systems or "clickers" to student reports of an "enhanced learning environment" and "student learning," although these outcomes are measured using solely student self-report data. In contrast, Carnaghan and Webb (2007) find that the use of "clickers" leads to a decline in engagement (as measured by students' oral participation) and does not lead to greater satisfaction with the course as other research might predict. Such findings raise concern. While technology provides a mechanism for mitigating certain aspects of the challenge to involve students who are less frequent or reluctant participators, it certainly is not equipped to resolve this problem entirely.[2]

A common theme connecting the research discussed above is the focus on techniques that increase the range of students who participate (and possibly the level of their preparation), while preventing excessive student discomfort. The relationship between required student participation and several outcome variables has been more recently examined in the work of Dallimore et al. (2003, 2005, 2006, 2008). Dallimore et al. (2003) examine factors that increase participation quality and find that students report that required participation—where cold calling is used and participation is graded—increases the quality of participation and the effectiveness of the discussion, including preparation. They also find that where cold calling is used and participation is graded, increased frequency of participation is correlated with student self-reported gains in oral and written communication skills development (Dallimore et al. 2008). Dallimore et al. (2003) draw on the expertise of faculty expert panels to identify techniques that make a cold call less intimidating to avoid excessive discomfort for students.

Further, Dallimore et al. (2006) examine a classroom context in which cold calling and graded participation are used. They report a relationship between this classroom context and increased participation frequency and increased preparation—and, in turn, increased comfort participating—among students. Dallimore et al. (2006) do not argue that cold calling and graded participation *per se* increase comfort participating. Rather, their results show that cold calling and graded participation together increase students' preparation and their participation frequency, and that more preparation and more frequent participation increase students' comfort participating. They also report a positive correlation between preparation and participation frequency. In addition, they report that students who are more predisposed toward class discussion tend to prepare more and participate more. Their exploratory study examines only a single graduate accounting course taught by a single instructor.[3]

This study is designed to extend the exploratory work of Dallimore et al. (2006) by examining the relationship between students' overall learning and comfort participating in class discussions. Further, it extends the Dallimore et al. (2006) model of student comfort by testing additional factors that affect student comfort that were identified in the literature discussed above. In addition, it tests interrelationships among factors that affect student comfort as the literature also suggests.

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[2] The use of computers in instruction is not new, and we have seen rapid movement toward technology in teaching and as a tool for student learning. It has been utilized as a tool to engage students in discussion for a variety of reasons (e.g., it allows for more participation without the constraints of class time and allows students more control over both the content and context of their participation). The impact of technology on class interaction is investigated in the field of business management by Arbaugh (2000) who, when examining participation in an asynchronous Internet-based MBA course, finds no significant differences in learning or interaction quality from the conventional classroom. However, he does find that there is significantly more participation overall, a finding consistent with Bump's (1990) earlier conclusions.

[3] In another working paper, Dallimore et al. (2010) have shown that in class sections where instructors cold-call frequently, sophomores' comfort participating increases across the semester and that their comfort at the end of the semester is greater than the comfort of students in sections where instructors cold-call infrequently (although the difference is not statistically significant).

RESEARCH HYPOTHESES

Student Comfort with Class Discussion

Dallimore et al. (2006) identify four variables associated with a student's experience prior to a course (typical participation frequency, typical satisfaction with own participation, and familiarity with and liking of class discussions) and two variables associated with a student's experience in a given course (typical preparation and frequency of participation) that are related to student comfort participating in class discussion during the course.[4] Despite the fact that the Dallimore et al. (2006) data are from a single graduate course taught by one instructor using primarily case discussion pedagogy, we expect the same results to hold for a large, multi-section undergraduate accounting course taught by multiple instructors using a mixed pedagogy. Thus, H1 states:

> **H1:** Student experiences with class discussion prior to the course, measured by typical frequency of prior class participation, liking of class discussion, and familiarity with class discussion, should be positively related to actual participation frequency.[5] Further, student experiences prior to the course, measured by overall satisfaction with one's class participation and typical class participation frequency, should be positively related to actual preparation in this course. Finally, actual frequency of participation and actual preparation in this course should be positively related to comfort participating in class discussion.

In addition to the variables identified by Dallimore et al. (2006), there is considerable support for the value of other students' comments contributing to a student's comfort (Christensen 1991; Leonard 1991). Oral communication skill development has also been shown to be related to comfort participating in class discussion (Dallimore et al. 2008). Therefore, H2 states:

> **H2:** The value of other students' comments for one's own learning and the development of oral communication skills in this course should be positively associated with comfort participating in class discussion in this course.

Interrelationships among Variables that Affect Comfort

Prior literature has shown that several of the hypothesized predictors of student comfort with class discussion are related in predictable ways. Christensen's (1991) discussion of shared language and ease of communication among peers suggest that as students learn to value other students' comments, they may be willing to participate more frequently. The value of other students' comments for one's own learning (Elmore 1991; Leonard 1991) and participation frequency (Dallimore et al. 2008) have been shown to be related to oral communication skill development. And, Dallimore et al. (2006) report a correlation between participation frequency and preparation for class discussion. These results give rise to the following hypotheses:

> **H3:** The value of other students' comments should be positively related to participation frequency.

> **H4:** The value of other students' comments should be positively related to oral communication skill development.

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[4] In the Dallimore et al. (2006) model, prior satisfaction is positively associated with comfort participating in class discussion in that course, but the relationship is not statistically significant. The five remaining variables in the Dallimore et al. (2006) model are significantly associated with student comfort.

[5] Dallimore et al. (2006) found a negative relationship between liking of class discussion and actual participation frequency. However, this result was different from the initial expectation and was explained as due to the intervention of a specific treatment, namely, a course with cold calling as a normal and regularly used pedagogical technique.

H5: Participation frequency should be positively related to oral communication skill development.

H6: Preparation for class discussion and participation frequency should be positively related.

Student Learning

Weaver and Qi (2005) find that active participation (i.e., frequency) contributes to learning. Dallimore et al. (2006) also suggest that some factors associated with student comfort may be associated with student self-reported measures of learning. Thus, we expect that comfort or its predictors will be positively related to objective measures of student learning. Therefore, H7 states:

H7: Comfort participating in class discussion should be positively associated with objective measures of student learning.

RESEARCH DESIGN

Data were gathered in 14 sections of a single undergraduate course. In each section, two questionnaires were administered to students, and students' grades were provided by instructors after the course ended.

Introduction to Management Accounting Course

This research was conducted in the undergraduate Introduction to Management Accounting course required for the B.S. in Business Administration degree at a large, private research university. This course is typically taken during the sophomore year. Class size ranges from 30 to 45 students, with an average of 38 students. There are about 24, 100-minute classes in the course. The course was selected because it has multiple sections taught by multiple instructors each year; a common syllabus, pedagogy, and final exam[6] are used across all sections. Further, the course requires active participation in class discussions and exercises, including two case discussions, and class participation is graded. The mixed pedagogy includes lecture, small group problem solving, problem discussions, case discussions, written case analyses, team projects, and student presentations. Data were gathered from 14 sections of this course, taught in two consecutive fall semesters.

Class Discussion in the Introduction to Management Accounting Course

The amount of discussion and student participation varies from day to day. On some days, new technical concepts are introduced that limit the amount of discussion. At the other extreme, two or more cases are discussed in each course, where the entire class period is devoted to discussion. The amount of discussion in other class periods lies between these two extremes.

Class participation in the Introduction to Management Accounting course includes student answers to questions about material presented in short lectures, discussion of short problems done in class in small groups, and case discussions that follow student write-ups of the cases. Student contributions can be presenting the quantitative answer for a calculation (like a break-even quantity), or explaining what factors might lead to a direct material quantity variance or why a manager should reject a special order offer, as two examples. In case discussions, a student might be asked, "What decision should Mr. Moyer make, and why?" or "What is the implication of your calculation for the company?"

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[6] Instructors have the option to customize 20 percent of the final exam.

Most students in the class are sophomores, but some have had a paid six-month co-op (internship) experience prior to the class because of the co-operative educational program at this private university. Further, many students have had some work experience—such as summer jobs—that would enable them to explain such things as commissions versus salaries, budgeting sales demand, etc.

Grading Class Participation

Class participation is a graded element of all sections of this introductory course, and the instructors would agree that the class participation grade should reflect the student's overall pattern of contribution to the class discussions throughout the course. The objective in recording data on student contributions is to record a sufficient sample over the course of the semester so that the student's overall contribution pattern can be assessed; thus, credit need not be assessed for every comment.

While instructors vary in how they record information, they typically grade participation at the end of each class, when their memory of the class is fresh. Some have a simple numeric system (for example, 0 = Student absent; 1 = Student present; 2 = Student made some comment(s); 3 = Student made good comment(s); 4 = Student made outstanding comment(s)). Others record qualitative data about the student's contributions (for example, noting whether the student volunteered or was cold-called; the nature/content of the contribution, as well as its quality; whether the student contributed once, a few times, or several times; plus other information relevant to assessing participation). "Wrong answers" may simply reflect part of the normal learning process, and, as such, may receive credit for participation.[7]

Data

Questionnaires were used to gather data on student perceptions about class discussions. The pre-course questionnaire was administered during the first two weeks of the course. The purpose of the pre-course questionnaire was to establish a baseline prior to the course of students' attitudes and behaviors related to class participation. Respondents also provided their grade point average. The post-course questionnaire, administered in the last two weeks of the course, focused on experiences in this course such as self-reported preparation, participation frequency, and comfort participating in class discussions. In addition, self-reported perceptions of one's own communication skill development and the class participation frequency of others in the class were also collected.

Grade data were gathered from instructors after the end of the course. Four graded elements were recorded for each student: class participation grade, final exam (raw score), and grades for two written case analyses, which were averaged to create an average case grade.

Instructors

Six full-time instructors taught the 14 sections of this course. Two were tenured faculty, one was tenure track but non-tenured faculty, and three were full-time non-tenure track faculty; three were women and three were men.

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[7] While some may think that grading class participation is very subjective, we would argue that instructors who are planning to grade class participation pay close attention to student comments in class and can represent fairly a student's comments using a scheme such as those outlined above. In some respects, it is similar to grading a written case analysis—there are aspects to the grade that are quite objective (e.g., does the student have the correct amount of variable cost in a pro forma budget?) and other aspects that are more subjective (e.g., how good is the student's recommendation, given their analysis of the situation?).

Students

There were 540 students enrolled in the 14 sections of the course. To ensure confidentiality, students were not asked for their names; however, to enable pre-course, post-course, and grade data to be matched for analysis purposes, questionnaires asked for the last four digits of their nine-digit student identification number. Accurate, matching identification information on both the pre-course and post-course surveys was obtained from 323 students of which 168 (52 percent) were women, and 155 (48 percent) were men.[8]

Analysis

Path analysis was used to model and test relationships for two dependent variables: student self-reported comfort with class discussion and objective student learning based on grades for two case analyses, class participation and the final exam grade. Path analysis was chosen because of the directed hypothesized relationships between independent variables and the two dependent variables, comfort with class discussion and learning, as well as the directed hypothesized relationships among some of the independent variables.

Model fit for path models is less straightforward than for regression models using OLS. Multiple measures are often recommended (Garson 2009; Kline 1998). Because the model χ^2, a measure of overall model fit, is highly sensitive to sample size, we use instead, the Tucker-Lewis index (TLI) to measure the fit of the model compared to the null model (Bentler and Bonett 1980; Kline 1998). Most consider a good fit, based on the TLI, as a value above 0.90 (Bentler and Bonett 1980; Kline 1998); however, some go down as far as 0.80 (Garson 2009). We used two other measures of model fit that are considered to be less sensitive to sample size—the comparative fit index (CFI) and the root mean square error approximation (RMSEA). The CFI indicates a good fit if the value is above 0.90; the RMSEA indicates a good fit for values less than 0.08 (Garson 2009).

RESULTS

Descriptive Statistics

Table 1 presents the mean response for the survey questions and the course grades used to measure learning (composite grade, final exam grade, average case grade, and class participation grade). All survey questions based on a seven-point Likert-type scale are significantly higher than the neutral or indifferent point of 4.0, indicating that students on average came into the class with more positive than negative predispositions toward class discussion. Further, they left the class with more positive than negative feelings about class discussion, their own participation in and comfort with class discussion, and feelings of how the course affected their oral communication skill development. The mean final exam, average case, and class participation grades are typical for this course.

Factors Related to Student Comfort with One's Own Class Participation

Figure 1 presents the path analysis model for student comfort when participating in class discussion with estimated standardized regression coefficients and goodness-of-fit measures. The results provide strong support for H1, which hypothesizes relationships among variables from the Dallimore et al. (2006) comfort model. With the exception of two pre-course variables (Satisfaction and Familiarity), which were not significant, all other relationships to Preparation, Participa-

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8   The remaining students may have been present for the administration of one questionnaire and not the other, or they may have forgotten or incorrectly remembered the last four digits of their student identification number. In these instances, the data from the pre-test, the post-test, and their student grades could not be matched and they were eliminated from the analysis sample. Mean comparison tests between matched and unmatched samples were conducted for the dependent and independent variables in the final model. No significant differences between the two groups were found.

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TABLE 1

Variable Definitions and Mean Response

Variable Name	Survey Question	Mean Response	n
Pre-Test			
Familiarity	How familiar are you with class discussions? (1 = Not familiar; 7 = Very familiar)	5.65	295
Liking of Class Discussion	How much do you like class discussions? (1 = Not at all; 7 = Very much)	5.14	295
Typical Participation	In other accounting and math-related courses, I participate: (1 = Not at all; 7 = Very frequently)	4.49	294
Satisfaction	In general, my satisfaction with my class participation is: (1 = Not satisfied; 7 = Very satisfied)	4.79	295
GPA	What is your Grade Point Average?	3.36	275
Post-Test			
Preparation	What is your typical level of preparation for this course? (1 = Low; 7 = High)	4.83	292
Participation Frequency	In this course, I actually participated: (1 = Not at all; 7 = Very frequently)	4.62	293
Comfort Participating	In this course, when I participated in class discussion, I felt: (1 = Less comfortable; 7 = More comfortable)	4.87	293
Value of Other Students' Comments	How valuable are other students' comments for your own learning? (1 = Not at all; 7 = Very valuable)	4.48	293
Oral Skill Development	How did this course affect your oral communication skills? (1 = Affected negatively; 7 = Affected positively)	4.57	291
Composite Grade	Composite Grade (weighted average of case, class participation, and final exam grades) [MAX 100]	80.20	284
Class Participation Grade	Class Participation Grade [MAX 100]	87.46	295
Final Exam Grade	Final Exam Grade [MAX 100]	74.95	295
Average Case Grade	Average Case Grade [MAX 100]	85.91	284

tion Frequency, and Comfort Participating were positive and significant. Hence, the more students prepare, the more comfortable they are participating, and the more often they participate, the more comfortable they become when participating.

Similar to the finding relating students' prior satisfaction with class discussion to preparation reported by Dallimore et al. (2006), the relationship between Satisfaction and Preparation is also positive but not significant. In our analysis, Familiarity is positively related to Participation Frequency, but the relationship is not significant; however, in Dallimore et al. (2006) the relationship was positive and significant. The change in significance for Familiarity may be due to the shift from a graduate student sample to an undergraduate student sample or, possibly, to the change from a case-based course taught by one instructor to a multi-section course with multiple instruc-

FIGURE 1
Path Model for Comfort Participating with Estimated Standardized Regression Coefficients and Model Fit Measures
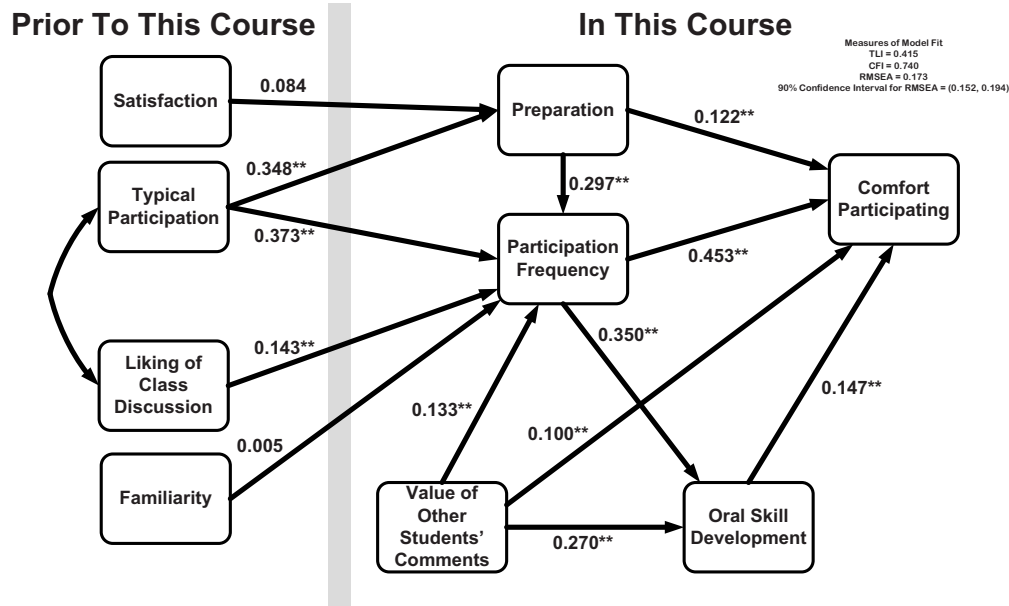
* p < 0.05; ** p < 0.01 (all two-tailed levels of significance).

tors using mixed pedagogy. However, there is poor fit for the estimated path model, based on three measures of fit: TLI is low; CFI is below 0.90; and RMSEA is higher than the desired level of 0.08 or less.[9]

In addition to the two post-course variables, Preparation and Participation Frequency, the Value of Other Students' Comments for one's own learning and the extent to which the course affects one's own Oral Skill Development are also positively and significantly related to Comfort Participating, which supports H2. Further, the relationships contained in H3, H4, and H5 are also supported by the path analysis results. The Value of Other Students' Comments was positively and significantly related to both Participation Frequency and Oral Skill Development. Additionally, Participation Frequency was positively and significantly related to Oral Skill Development.

Hypothesis 6 predicted that Preparation and Participation Frequency should be positively related. The model presented in Figure 1 includes just the relationship going from Preparation to

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[9] The path analysis model, including just the statistically significant variables, resulted in estimated standardized regression coefficients that were virtually the same and a far better fit (TLI = 0.767; CFI = 0.925; RMSEA = 0.116 with 90 percent confidence interval limits of (0.085, 0.149)).

Participation Frequency, which is positive and statistically significant.[10] This result is logical as well-prepared students have more opportunities to actively participate in class discussion.

Factors Related to Student Learning

To measure overall student learning, a Composite Grade is created by weighting the individual grade components (Final Exam Grade, Average Case Grade, and Class Participation Grade) by their actual weight in the final grade for the course as stated in the course syllabus (30 percent, 15 percent, and 10 percent, respectively);[11] the result is normalized to a scale of 100 points. As stated in H7, we expect to find a positive relationship between Comfort Participating and Learning. Further, since past academic performance is typically related to current academic performance, we included students' grade point averages (GPA), before the course, as a control variable and expect that they will be positively related to students' overall learning in the course.

As shown in Figure 2, the path model to explain Learning (Composite Grade) includes a reduced path model for Comfort Participating as well as the control variable, GPA, based on courses completed prior to this course. The reduced path model for Comfort Participating contains just the significant variables (i.e., all but the two pre-course variables, Satisfaction and Familiarity with class discussion) found in the path presented in Figure 1. The results show a positive and significant relationship between the Comfort Participating model and Learning, which is consistent with H7.[12] In addition, the control variable, GPA, was positively and significantly related to Learning. The model fit is strong and improved from the Comfort model shown in Figure 1 with TLI above 0.80, CFI above 0.90, and RMSEA within range of the desired 0.08 value.

The Final Exam Grade itself is also a measure of overall student learning, because the final exam in this course is cumulative. The Learning model for Final Exam Grade contains the same path and predictors as those found for the Composite Grade. Thus, the Learning model for the Final Exam Grade looks like Figure 2. Both Comfort Participating and GPA are positively ($b_{Comfort} = 0.158$ and $b_{GPA1} = 0.438$) and significantly ($p_{Comfort} = 0.002$ and $p_{GPA1} = 0.000$) related to the Final Exam Grade. Further, the model fit is virtually the same as that reported for the Composite Grade model.[13] The similarity between these models is reasonable, since not only is the final exam intended to measure overall course content mastery, but the Final Exam Grade also represents just over half of the Composite Grade.

DISCUSSION AND IMPLICATIONS

Notably, the positive relationship between the reduced Comfort Participating model and overall learning suggests that students who feel more comfortable participating in the class discussions tend to master the material more than students who feel less comfortable. This includes performing better on management accounting final exams that require students to perform tasks such as identifying relevant costs to compute the cost of alternative choices, computing break-even volumes, and computing activity-based costs.

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[10] When the directional relationship going from Participation Frequency to Preparation was included in the model as well, the estimated regression coefficient was not significant, but had a negative sign, which was difficult to interpret, logically.

[11] The remainder of the student's grade was composed of midterm, quiz, and homework grades.

[12] Each of the post-course variables in the reduced Comfort model was tested individually to see if it was directly related to learning. None of the direct links was statistically significant. Hence, Comfort is directly driving Learning. By contrast, post-course variables found to affect Comfort (Preparation, Participation Frequency, the Value of Other Students' Comments, and Oral Skill Development) are all indirectly related to Learning through Comfort with class discussion.

[13] The Final Exam Grade model fit was good (TLI = 0.815; CFI = 0.909; RMSEA = 0.088 with 90 percent confidence interval limits of (0.067, 0.110)).

FIGURE 2
Path Model for Learning (Composite Grade) with Standardized Regression Coefficients and Model Fit Measures
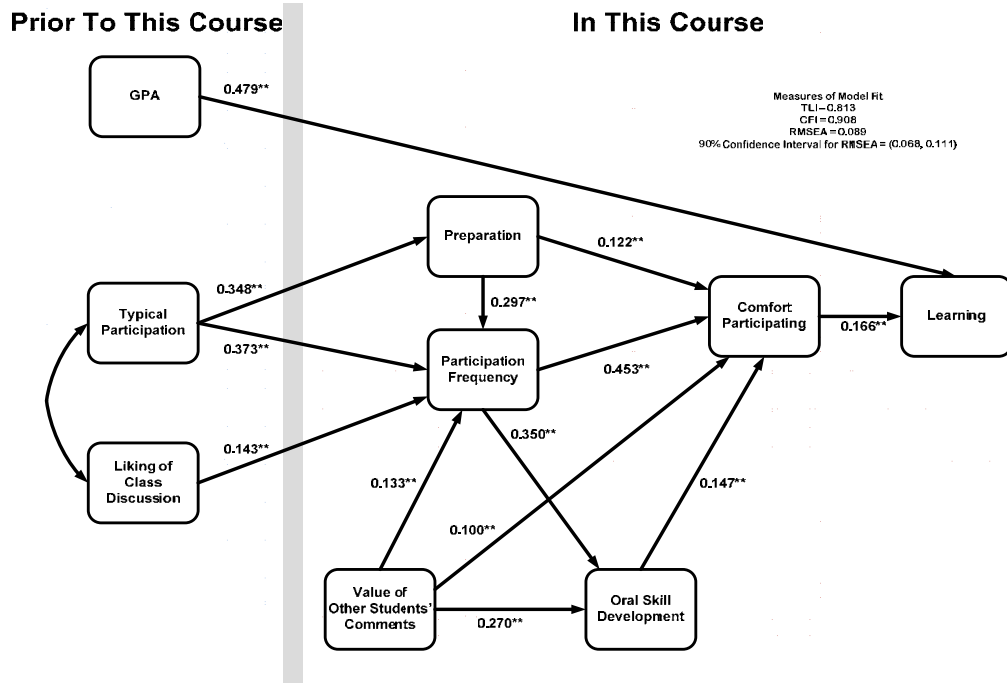
* p < 0.05; ** p < 0.01 (all two-tailed levels of significance).

As shown above, comfort is related to self-reported preparation for this course, frequency of participation in this course, development of oral communication skills, and appreciation of others' comments. More preparation and more frequent participation suggest greater engagement with the material. More oral skill development and more appreciation of others' comments, together with more frequent participation, suggest greater engagement with other students. Thus, it may be that greater engagement with the material and with other students leads to greater mastery and deeper understanding of the content and, hence, higher scores on objective measures of learning.

Nelson et al. (2008) recently reported the importance of the effect of first-year accounting courses on senior accounting majors' attitudes toward the accounting profession. By increasing students' feelings of engagement with the material and other students, and by increasing their grades and providing the sense that they can master accounting content, class discussions may provide an opportunity to encourage more students to choose accounting as a profession and a major.

Both this study and the Dallimore et al. (2006) study highlight the importance of frequency of participation and preparation for comfort participating in class discussions. The good news for instructors is that they can influence both of these variables. As this study clearly shows, one way students get comfortable participating is *by* participating. Although they may not be comfortable

participating initially, allowing students to opt out of participating in class discussions means they are not going to *become* comfortable. Thus, using techniques to enhance nonvoluntary participation (like cold calling) to ensure that every student participates can increase the frequency of participation by less frequent participants and can start those students on a path that will lead to increased comfort participating.

The results on preparation are interesting. Preparation has a complex relationship with comfort participating and learning. First, preparation directly increases comfort participating, which, in turn, increases learning. Second, it indirectly affects comfort participating, hence learning, by increasing participation frequency, as well-prepared students may be willing to participate more. Thus, actions teachers take to increase preparation have payoffs not only in terms of student learning, but also in terms of how often they actively participate in class discussion, and their comfort when participating. Such actions might include pop quizzes or written pre-class assignments like case analyses. Alternatively, Dallimore et al. (2006) report that setting an expectation of participation using graded participation and cold calling increases preparation. Thus, if the expectation of participation applies to an entire class, it is possible that many students prepare more and participate more, leading to richer discussions and creating the opportunity for greater learning for all students.

The Learning model further illustrates the richness of the class discussion pedagogy. As just discussed, increased preparation for class not only increases a student's comfort participating, it also encourages the student to participate more frequently. Further, a student's comfort participating in the discussion increases not only as they participate more frequently, but also as they learn to value the comments of other students. Valuing the comments of other students not only increases their comfort, it encourages them to participate more frequently, and it enhances their oral skill development. The fact that self-reported oral skill development is significantly related to participation frequency and the value of other students' comments is of particular interest. Among other possibilities, it identifies a potential opportunity for faculty to enhance student oral communication skill development in an indirect and ongoing way through class discussion characterized by the frequent participation of a broad range of students. Thus, class discussion provides different opportunities for learning through preparation, through active participation, and through the comments of other students, as well as different types of learning: learning content, in this study, accounting content, and at the same time, learning and developing oral communication skills.

LIMITATIONS AND FUTURE RESEARCH

The results and discussion of this study should be interpreted in light of its limitations. First, student data were gathered only for one course in introductory management accounting with multiple sections (14) averaging 38 students and multiple instructors (six). Thus, it is difficult to generalize to other accounting courses or other courses in general.

Second, the course that was the focus of this research project is a required course for all undergraduate business majors. The generalization of relationships discovered in this study relating preparation, class participation frequency, comfort with class discussion, and learning is limited to business students. Some instructors might argue that accounting majors prefer passive learning environments more than active classroom environments, based on class discussion. Further work should examine the extent to which these relationships hold for accounting majors, *per se*.

Third, most instructors normalize grades to some expected distribution. Thus, if real differences in learning result from differences in a particular variable—comfort participating, for example—those differences in learning may not be fully reflected in the grade data, which would bias against finding significant relationships between grades and variables of interest in this study.

Finally, statistical models can illustrate relationships among these variables, but they cannot fully explain why these relationships occur or the process through which the relationships develop. Qualitative data gathered from students could be used to elaborate on the relationships and processes. For example, analysis of student written responses to questions, like "Explain how your participation in class affects your learning," may reveal interesting insights from the student's own understanding into how and why the relationships among frequency, comfort, and learning develop. Further, given the relationships among these three variables, and given that some students do not volunteer, additional research on the effects of calling on students whose hands are not raised (cold calling) is needed to understand and evaluate this approach to including non-volunteers in class discussion.

SUMMARY

This study examined the relationship between factors associated with student comfort participating in class discussion and students' overall learning. Pre- and post-course surveys concerning student perceptions and behavior about class discussion in an introductory management accounting course were gathered from sophomore business students at a large, private research university, and objective grade data were gathered from instructors of the course. The primary results indicate that overall learning is positively related to students' self-reported comfort with class discussion. Student comfort with class discussion, in turn, is positively related to two pre-course factors (typical frequency of participation in prior courses and liking of class discussion) and to four factors related to the course: typical preparation for class, frequency of participation in class discussion, the value of other students' comments for one's own learning, and the effect of the course on one's own oral communication skill development.

That overall student learning is positively related to comfort with one's own participation in class discussion is an important finding. It provides a valuable extension of literature concerning learning, as objective measures of learning were used rather than student self-reported perceptions about learning typically used in prior research. Further, because each student's participation contributes to the learning of others, this study provides support for the utilization of strategies to increase both the preparation and participation of all students, including strategies designed to increase nonvoluntary participation. Finally, our Comfort model provides insight into the process through which participation in class discussion affects learning and a richer understanding of why participation in class discussions matters.

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