Effects of Communication Medium on Class Participation: Comparing Face-to-Face and Discussion Board Communication Rates

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LIS education is moving toward programs that may be delivered in either face-to-face or online modes, but it remains an open question whether the medium of communication itself differentiates the tendency of students to interact with their instructor and other students. Since class credit is often associated with the extent to which students participate in class discussions, it is of practical as well as theoretical importance that we gather data about this effect. This study provides a controlled look at class participation rates in a single class in which individual students had the opportunity to participate in both modes. It interprets the results in the light of theories concerning forms of communication apprehension and factors related to the nature of the individual ("trait") rather than a function of media context ("state").

Keywords: classroom participation; distance education; computer mediated communication; communication apprehension; educational technology

Introduction

The field of LIS education has firmly adopted the practice of educating students using both face-to-face and distance education delivery methods. Even before the birth of the internet, a special issue of JELIS discussed distance education within LIS (Barron, 1987a). Almost ten years later, Barron (1996) pointed to the steady growth in the number of courses offered off campus and the increasing variety of telecommunications options used in LIS distance education. Distance education and its role in LIS education were part of the discussion of the future of the LIS profession and LIS education in the 2000 KA-LIPER report (cf. Pettigrew and Durrance, 2001; KA-LIPER, 2000). The edited volume Benchmarks in Distance Education: the LIS Experience (Barron, 2003) described the efforts of the 28 ALA-accredited schools that participated in the development of distance education in LIS. Wilde and Epperson (2006) discussed the "dramatic increase" in the number of schools offering professional degrees in LIS that offered their program on-campus and via distance education in the period from 2001 to 2006, quoting the 2003 edition of the Encyclopedia of Library and Information Science's estimate that almost 80% of the U.S.'s LIS programs include a distance component (p. 240). Marek (2009) cites figures from the American Library Association indicating that 66% of accredited LIS programs offer part of their curriculum online and an additional 23% offer a complete online program, showing growth even in the recent past. These data show the long-standing interest in and growth of distance education programs in LIS.

In early attempts to offer distance education, the available communications technologies limited the extent to which students and instructors could interact. Advances in communication technologies have overcome many of the earlier problems and more fully support information sharing and community building. Face-to-face and online classes provide ways for students to communicate with each other
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and with their instructors, but the question of whether the medium by which they communicate influences their rate of participation remains open.

Educational practice often dictates the framework(s) instructors apply as courses are developed. Within education theory, the field known as the Scholarship of Teaching and Learning (SoTL) has gained recognition as an important resource for instructional practice (Gayle, Preiss, Burrell, & Allen, 2006; McCroskey, Richmond, & McCroskey, 2002). One important SoTL subarea is related to the study of "Communication in Instruction," including the study of factors that affect the tendency of students to communicate within instructional settings.

Communication is a multi-dimensional process. Both the temporal and spatial environments affect the way individuals may interact. One way of characterizing this environment is in terms of the temporal simultaneity of the behavior. Related synchronous communicative acts take place at the same time, while asynchronous acts are dispersed over time. The spatial dimension is most strongly affected by communication technology, since technology enables people to communicate without being in the same place at the same time.

While the exchange of ideas depends by definition on communication, communication behavior itself has emotional aspects that may also be affected by the circumstances under which the communicative acts occur. Thus, in a world in which communication media allow people to exchange information synchronously or asynchronously while being located in the same or different physical spaces, it becomes important to know if these media exercise effects on the communicative act.

This paper will begin by providing some background about ideas about the role of communication in LIS distance education. Next, the literature related to classroom communication in general will be addressed, followed by an overview of the literature on computer-mediated communication in education. Research on communication apprehension associated with the two instructional media of prime interest to this paper (face-to-face vs. asynchronous discussion) will also be discussed. Following the review of these literatures, a project that looked at communication patterns in a graduate level class on information representation and organization at the University of Tennessee will be described. This research project asks two questions: First, might class participation rates reflect individual differences among students? Second, can this effect be moderated by the technology used to effect class participation?

Communication in Library and Information Science Distance Education Programs

LIS programs provide a nexus for many issues related to distance education, including the need for continuing education and for adult independent study (Faibisoff & Willis, 1987), and often focus on the many factors that influence the ability to deliver programs through communication technologies. In a special issue of JELIS, Barron (1987b) reports on a study of telecommunication technologies (primarily televised course delivery) used in LIS instruction and perceptions of the adequacy of their use. The next decade brought momentous changes to the technology available to support distance education, including the growth of popular access to the internet. The impact of this new way to deliver LIS education was chronicled in a special issue of the Journal of the American Society for Information Science (JASIS) in 1996. The issue addresses technological change and its effects on the allocation of educational resources and the delivery of LIS education, and the nature of educational models and the experience of teaching and learning. In a related article on the influential KALIPER report, Sutton (2001) discusses the formative influence of information technology on
A decade of web-based online education in LIS programs was marked in a special Winter 2007 issue of JELIS in which Harris, Kazmer and Mon (2007) discuss the experience of face-to-face and online classes and of classes using a mixture of the two (hybrid and blended programs), from the student and faculty perspectives. They point out the need to understand more about ways media use affects the quality and character of the learning experience, and, in particular, of communication.

The issue of social effects of media use in LIS education has been approached in several ways. One approach has been to examine the ways various information and communication technologies have been used to build social networks among LIS students. Studies have been made of the use of internet forums (Maccia & Freedman, 2004), blogs (Hall & Davison, 2007), and instant messaging (IM) services (Nicholson, 2002).

A second approach has been to study the interaction framework to better understand the features supporting successful online interaction experiences. Miksa, Burnett, Bonnici and Kim (2006) developed a measurement method to analyze more finely the interaction dimensions underlying student satisfaction in online courses. Dow (2008) looked closely at the use of social presence as a predictor of satisfaction with online learning.

A third approach to the nature of social interaction in distance education has evolved from work on the development of a sense of community among distance learners. Nicholson (2005) saw the development of the collaborative culture that is institutionalized in librarianship in the development of a “communication scaffold” in LIS programs, linking this to interaction dimensions that could support such a scaffold. Another group of studies done by Kazmer and Haythornthwaite and several collaborators has looked at several different facets of learning communities and their interactions (cf. Haythornthwaite et al., 2007; Haythornthwaite, Kazmer, Robbins, & Shoemaker, 2000; Kazmer, 2006, educational programs and the emerging role of instructional programs in different formats, including web-delivered distance education.

While many issues discussed in the 1980s and 1990s related to the availability of resources and to limits of the technologies available, a continuing thread pursued the topic of the nature of social interaction brought about through computer-mediated instruction. Barron (1987c) analyzed a case study outlining factors affecting faculty and student perceptions of mediated class delivery. Two factors of interest in this study are related to the focus of the current paper: the amount and quality of contact with course instructors and with peers, and the judged comfort in asking questions and participating in class discussion.

This focus on changes to the communication process is echoed by Sutton (1996) in the special issue of JASIS mentioned above. He argues for three generations of distance learning models tied to the technologies that support distance instruction. Moving from traditional correspondence teaching (first generation) based on textual and asynchronous communication, through instruction using multiple media (second generation), Sutton suggests that “third generation distance education is social in nature and emphasizes communication among all members of the academic community” (p. 822) and focuses on collaboration.

The importance of support for communication and collaboration is echoed over the next few years (e.g., Bard, 1996; Buchanan, Xie, Brown, & Wolfram, 2001; Smith, Lastra, & Robins, 2001; Stanford, 1997). It is a prominent issue in descriptions of LIS distance education options (e.g., Estabrook, 1997; Sievert, Johnson, Hartman, & Patrick, 1997; Small, 1999) and in the Winter 2002 issue of JELIS that provides an overview of the success factors inherent in many of the better-known distance programs.

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In particular, Kazmer's own work has centered on community development at a number of different time periods, including the entrance to distance education programs (Kazmer, 2000), while in the program (Kazmer, 2005; Haythornthwaite et al., 2007), and on leaving the program (Haythornthwaite et al., 2006).

The literature shows the continued growth of the use of distance education and thus of computer-mediated communication within this field, and a consistent thread that looks into the nature of communicative acts and their role in the education process. It is time to address the nature of the communication in the classroom and communication using computer-supported communication technologies directly.

Classroom Participation

The belief that class participation is an important component of the educational process is expressed almost universally on online syllabi. This belief is further manifest by the practice of assigning grade values to active participation. For example, an inspection of the syllabi available for the School of Information Sciences (SIS) at the University of Tennessee in November 2009 showed that 31 of the 40 syllabi provided class credit for participation, either in synchronous class sessions (in on-campus or in synchronous online classes) or via asynchronous discussion boards. The percent awarded for class participation varied from five to twenty percent. To test the generality of this finding, an inspection was made of grade-associated point distributions for the top LIS schools listed in U.S. News & World Report in 2010. To achieve a sample of 100 syllabi, eight sites were examined. These data show a similar pattern of awarding points, with a modal value of 10% of the total points given for class participation and a median between 10 and 15% overall. In many cases, points are awarded for either one or a combination of participation in class or in asynchronous discussion boards. In several cases, the belief is expressed that asynchronous discussion boards provide a way for students who dislike speaking in class to communicate more freely with their peers. Rewarding class participation assumes that it is an important measure of student involvement that is not affected in a major way by factors other than the students' interest and preparation. The belief that computer-mediated communication, in particular asynchronous communication, allows students to communicate more freely may be a belief not based on data. The literature review that follows provides evidence about both of these issues.

Communication Apprehension in the Face-to-face Classroom

It is widely accepted that communication in the classroom plays an important role in successful learning environments. McCroskey et al. (2002) point out that students who do not talk much in the classroom see themselves as less able and are evaluated less positively by their teachers. In a meta-analysis of the relationship between classroom interaction and educational outcomes, Kerssen-Griep, Bayle and Preiss (2006) say that “Many educators would agree that classroom interaction is an essential aspect of the education enterprise” (p. 129). They discuss factors that affect the success of teacher-student communicative interactions, and consider various high level factors including interpersonal communicative relationships within and outside the classroom, listening behaviors, student motivation, teacher influence, and power relationships. Among the specific factors is communication apprehension (CA).

The study of CA began in the 1970s. Communication apprehension has been defined as “an individual’s level of fear or anxiety associated with real or anticipated communication with another person or persons” (McCroskey, 1977, p. 78). Research first focused on CA as a response to oral communication demands but spread to
written communication relatively quickly (McCroskey, 1981a). McCroskey (1981b) points out that communication skills are necessary components of four of the five basic skills acquired in education (reading, writing, speaking and listening) and are thus important.

The effects of CA can be severe. McCroskey, Booth-Butterfield, and Payne (1989) undertook a four-year longitudinal study comparing high, moderate and low CA students at West Virginia University. They found that high CA students were less successful academically and that they dropped out at a statistically significantly higher rate during their first two years in university. A more recent review by Bourhis, Allen and Bauman (2006) identified three consequences of CA relevant to the present analysis: behavioral effects, cognitive effects, and intercultural issues. Their evidence shows that CA has cognitive effects through its impact on the quality and duration of communicative behaviors, lowering the quality and quantity of interaction in high CA individuals. They point out that CA lowers the effectiveness of the educational environment for high CA individuals since “most educational techniques require or expect active participation on the part of the student” (p. 217), adding that this effect has been shown across content areas and age groups. Of special interest to programs that seek to include a diverse student body as LIS programs do, Bourhis and his collaborators also point to the importance of intercultural differences in communication patterns. Their meta-analysis “demonstrates that, not surprisingly, many Asian cultures (Polynesian, Korean, Philippines, and Japanese) view themselves as most apprehensive about communicative events” (p. 219). This theme is also noted in an earlier paper by Liu and Littlewood (1997) that looked into the causes of an observed reticence on the part of East Asian students. Taken together, this research casts doubt on the validity of a belief that class participation rates can be taken as an unambiguous indicator of student involvement in the traditional classroom.

**Computer-mediated Communication in Distance Education**

The shift to distance education accompanies a shift from face to face to computer-mediated communication (CMC). Early CMC studies focused on the transformative effect that computerization exerted on the quantity and quality of interpersonal interaction in group decision-making processes (e.g., Kiesler, Siegel & McGuire, 1984). A more recent meta-analysis examined factors influencing the quality of and satisfaction with CMC on group decision making (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). One factor discussed is “Communication Openness,” i.e., “encouraging, or at least permitting, the open expression of views divergent from one’s own” (p. 172). The assertion is that CMC promotes greater participation because it removes constraints on communication. Does CMC affect the educational process in a similar way?

CMC technologies are an important part of the current learning environment. The Pew Internet and American Life Project (Madden & Jones, 2002) found that twenty percent of today’s college students were using computers by the age of eight. Years later, these twenty-somethings are deeply dependent on all aspects of the computer, the internet, and their communicative potential. This has helped change the way students learn and the way they experience university life. They view the internet as a functional tool, especially for information seeking and communication. Further, 33% claim that the majority of their use of the web is school related. An increase in use of instant messaging and social networking has been extensively documented and discussed in reference to the academic setting (e.g., Campbell et al., 2007; Casey & Savastinuk, 2006; Gibbs, Simpson & Bernas, 2008). College students expect ease
and efficiency from computer mediated communication technologies, and they expect to see it reflected in the classroom (Coyle, 2007).

Many researchers have become interested in the influence of CMC on an individual’s communication behavior. Buder (2007) explains, “Typical CMC studies try to identify how the use of communication media... influences human behavior” (p. 209). The research in this area usually focuses on the differences between face-to-face interactions and communications that utilize computers. The growth in the use of CMC technologies in the classroom is a product of many factors such as shifts in social and psychological paradigms, an increased emphasis on student-centered learning, technological advancements, and a new awareness of problems with traditional notions of learning and teaching (Hannafin, 1992). Park (2007, 2008) has studied linguistic factors related to the development of social relations in CMC classrooms.

A commonly used CMC in higher education is the online discussion board or message board. Discussion boards can be synchronous or asynchronous, although the most common style is asynchronous, allowing for a great amount of flexibility in response time. Most academic discussion boards are supported by educational course management systems like Blackboard and are quite common on campuses across the United States. Discussion boards are a very flexible and easy to use form of computer-mediated communication.

Barker (2003) proposes several advantages of using discussion boards to supplement learning. First, she suggests that using asynchronous communications allows students a very flexible time frame in which to participate in a discussion. Instead of immediately raising a hand to interject a comment in the classroom setting, a student has more time to ponder the topic and formulate an articulate, meaningful answer. Second, geographic barriers are almost completely broken down by use of online discussion boards (see also Hara, Bonk, & Angeli, 2000). This type of communication is also fairly depersonalized since participants may not know much about each other’s physical appearance or behaviors during communication, and it may help foster contributions by those who may be too shy or nervous to speak up in a face-to-face setting. Barker also notes the strengthening of self-motivation and responsibility, increased access and opportunity, building a sense of community, and prolonged access to conversations and information as possible benefits of discussion board use.

Gibbs et al. (2008) provide a similar outline of the positive features involved in embracing the use of online discussion boards. Their argument is based on the idea that the American education system has limitations that may be overcome with today’s communication technologies. These include “fixed learning times, compartmentalized and passive learning activities, and instruction that does not account for individual differences, preferences, and styles” (p.63). The article claims that these can be unnecessary boundaries for learners in an information age. When one considers all the possibilities available with online communications, it seems almost necessary to use their ease and flexibility to enhance students’ learning experiences as much as possible. The benefits of CMCs make today’s students active, collaborative, and influential members of their own learning process, further increasing their stake and interest in the educational process (Coyle, 2007).

**Does Medium Make a Difference?**

The shift to distance education and its concomitant shift to discussion via discussion boards might be expected to affect various aspects of the communicative experience in education. Can we hope that the detrimental effects of communication anxiety associated with face-to-face class-
room experiences can be mitigated through technological innovation? Two separate forces could weigh against that positive outcome. First, it may be that there is communication apprehension associated with the use of CMC technologies, as there are with face to face educational settings. Second, communication apprehension may be not bound by the communication milieu (a state) but rather characteristic of an individual across situations (a trait), as discussed next.

Computer-mediated Communication Apprehension

Several features might create anxiety in communication situations mediated by computer technology. Buder's (2007) analysis of discussion board use suggests that there may be interpersonal barriers caused by the lack of information online participants have about the personal attributes of those with whom they are interacting. Baltes et al. (2002) have theorized that lack of knowledge about other participants can negatively influence the nature of interactions on a discussion board. This effect can be traced to two factors. The first is the lack of social cues: participants receive no visual or auditory clues about gender, age, or other social characteristics. The second is the lack of behavioral cues, like nods of the head or eye contact, that can stimulate information interchange. Several other authors (e.g., Hara et al., 2000; Kruger, 2005) similarly argue that it can be difficult to interact without these common signs that we receive in face-to-face interactions and that further refinements are needed. Buder (2007) suggests that providing shared information about participants could "recontextualize interactions" (p. 212).

Another potential negative effect on participation has been related to the flexible environment. Hara et al. (2000) write that the removal of time restraints can potentially overload some users (students and professors) by allowing "ceaseless opportunities to learn and work" (p. 116), and that users may feel less obligated to participate in discussion board conversations outside of class because they may not appear to be tightly integrated with the class. Studies of discussion board use (e.g., Gibbs et al., 2008; Schober, Wagner, Reimann, Atria, & Spiel, 2006) suggest that openly discussing requirements and expectations with students was the best way to achieve successful discussion board conversations and to overcome potential disadvantages of their use.

Other researchers have looked at computer-mediated communication apprehension (CMCA) more directly, seeking relationships among various aspects of computer and communication apprehension. Scott and Timmerman (2005) focused on the relationship of CMCA to technology use in the workplace while Damman (2007) studied it in the context of undergraduate education.

Scott and Timmerman (2005) explored the ways computer and communication anxieties relate to the usage of new technologies in various workplace settings, adding the effects of change over time by looking at users over a five-year interval. They found that CMCA is negatively correlated with the use of a variety of technologies, including email, chat, instant messaging, and a range of computer-mediated conference technologies. They show that computer apprehension is a better predictor of use than the less specific communication apprehension itself. This suggests that CMCA and CA could be separate processes or separable components of a single underlying process.

Damman (2007) looks at the effects of classroom communication, computer-mediated communication apprehension and information technology fluency. He investigated the way these factors affect classroom discussion and online threaded discussion board usage in an advanced undergraduate class in sustainable agriculture. The study showed a moderate negative relationship between the degree of
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classroom communication apprehension (CCA) and the amount of classroom discussion, which would be expected. However, he found that neither CMCA nor information technology fluency predicted participation rates in the online threaded discussion. Damman suggests that various features of the real-life class situation studied may have caused this differentiation between apprehension’s effects on different participation media. Nonetheless, this study further corroborates the potential distinct detrimental influences of communication media (in person, synchronous vs. online, asynchronous) modes on participation rates in an educational setting.

Trait or State

A theoretical approach to understanding the issues underlying participation in class-related communication can be drawn from the study of the origins of behaviors related to personality and personality disorders, as well as a wide range of other behaviors including cognitive and communicative processes. This discussion has been referred in terms of the contrast between trait and state and is extensively represented in the literature about anxiety-related behaviors (e.g., a search of PsychINFO for the co-occurrence of the terms “state”, “trait” and “anxiety” revealed over 6000 references in September 2010). The APA Dictionary of Psychology (VandenBos, 2006) defines trait as “an enduring personality characteristic that describes or determines an individual’s behavior across a range of situation,” implying that trait-determined behaviors are relatively stable features of the individual that predict related behaviors over time and that transcend situational variables, like communication medium. State is defined as “the condition or status of an entity or system, at a particular time... although the components or elements are essentially qualitatively stable, it is possible for them also to be dynamic” (VandenBos, 2006). State determined behaviors may be responsive to the specific conditions in which any piece of behavior occurs and may vary within the individual over time and situation. This implies that there may be differences in communication apprehension as a function of communication medium, as McCroskey and others argue below.

Early studies of communication apprehension proceeded as if anxiety-related behaviors associated with communicative acts were primarily learned (McCroskey et al., 2002), suggesting that the behaviors could be differentially affected by medium (i.e., a state). Bourhis, Allan and Bauman (2006) identify three approaches—skills training, systematic desensitization, and cognitive modification therapy—used as “cures” for communication apprehension, suggesting that CA may be a state-based effect. State-oriented theoretical frameworks are consistent with the observed separable effects of CMCA and CCA noted previously by Damman (2007). However, McCroskey et al. (2002) suggest that other research (e.g., Beatty & McCroskey, 2001; McCroskey, Heisel, & Richmond, 2001) provides contrary evidence and that the traits conceptualized as communication apprehension have been shown to have a strong genetic base and thus are true trait-oriented factors. If both communication apprehension and computer-mediated communication apprehension are tied to an underlying trait, one might expect that the participation rates of students will be affected in both face to face and in discussion board contexts. If they are states, participation rates might be different under different communication modes.

Research Questions

The present study addresses the relationship between participation rates in a face to face classroom environment and that in a series of class-related required discussion boards. Using a within-subjects design, the data compare the frequency with which the members of a graduate class in information science participate
in in-class discussions in a class that is primarily lecture-based with their participation in a series of required discussion boards associated with class content.

The following questions are addressed:

1. Were there individual differences in classroom participation and discussion board activity?
2. Can patterns of usage be established that show commonalities across these two different communicative media formats?
3. Is there a correlation between the participation of individual students in in-class discussion and their input to computer-mediated discussion groups?
4. Is there any evidence that the effects shown are due to the fact that the class knew that their communication behaviors in class and on the discussion boards were being studied?

Methodology

Data was gathered about the behavior of members of an on campus Master’s level course in information organization taught by the first author, most in their first semester in the program. The main goal of the data collection was to obtain counts of each instance of students’ participation in this face-to-face class and in the discussion board setting. This information was used to draw conclusions about the relationship between face-to-face and online participation of our subjects. The semantic content of these communicative instances was not analyzed.

Data were collected from September 9 to December 2, 2008, from 13 class sessions and five asynchronous discussion boards. At the beginning of the term, students were informed that their in-class and discussion board participation rates were being studied. The presence of the second author was fully revealed at that time. Students were given informed consent forms and were to return them to the second author rather than to the first author who was the class instructor. Only the data from the 20 class members (out of 25) who agreed to allow us monitor their activity were included.

To gather data for the class participation portion of the study, the second author attended class and watched and listened to the students, noting each time they spoke aloud in class discussions, during their own presentations, and when asked direct questions by the professor. These instances of participation were classified in three ways: communication to the whole class (c), direct response to the professor (pf), or a question (q). The totals of each of these types of participation were kept. All data was maintained and managed within a spreadsheet that also kept cumulative totals of instances of participation.

For the discussion board portion of the data, all posts made by participants on the Blackboard course site were collected. Posts were related to five separate topic prompts defined by the instructor. Each topic was tied to specific content areas in the course and made available to the participants at the time the content area was discussed in class. The class was broken into three discussion groups to encourage participation by establishing a consistent small group environment. Group membership was determined alphabetically by student surname and groups were approximately equal in size. The small group size was a methodological difference from the Damman (2007) study previously cited. To gain course credit, two posts were the mandatory minimum for each topic. In addition, there was a “General Class Discussion” board that had no mandatory posting requirements. We counted posts from this as well. Each post was originally classified as either post or reply, i.e., if the post was an original thread or a response. The data in these two categories was collapsed in the final analysis. This data was also kept in a spreadsheet to organize the overall totals of participation.
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Data Analysis

Question 1: Classroom and Discussion Board Activity Levels

Class members varied greatly in their participation levels. The total number of in-class communicative actions range from zero to 182 separate actions in the 13 possible class sessions. Measures of central tendency show a non-standard distribution, with an arithmetic mean of 26.85 and a median of 10. Participation in the discussion boards showed a more restricted range of actions, ranging from five to 22 postings over the five discussion boards. The arithmetic mean for discussion board postings was 12.65 and the median was 11.5. The less dispersed participation levels for the discussion boards are in line with the observation by Gibbs et al. (2008) that, in general, most students post only the required number of times.

Question 2: Patterns of Response Across Media

To establish if there is any pattern of response across media, participation rates were grouped for both in-class and discussion board data. Low, medium and high participation categories were established for in-class participation. “Low” was defined as 0–5 participative acts (less than one per two class sessions), “medium” as 6–13 participative acts (one every one or two class sessions), or “high” as 14 or more participative acts (more than one every class session). Similar patterns were established for the discussion board data. Because there were an obligatory number of posts for full credit, the “low” category was defined as 0–9 posts (below the number required for the class), “medium” was defined as 10–15 posts, and “high” was defined as 16 or more posts. The pattern of responses is shown in Table I.

The data in Table 1 demonstrate the consistency of discussion levels for individuals across the two media types. The highest number of responses appears in the diagonal, with low participation rates characteristic of both media and the largest number in each row in the column corresponding to the equivalent participation level in the other medium (class vs. discussion board). The greatest divergence is among those whose participation rates were “medium” in one of the media but “high” in the other.

Question 3: Correlation Between Individuals’ Participation in In-class and Discussion Boards

Because the data collection included observations of in-class behavior and recorded participation in class-related discussion boards, we were able to compare the behavior of individuals in both conditions. Because of the relatively small number of data points and because of the possibility of cells with 0 values, both Pearson (parametric) and Spearman (non-parametric) correlation tests were run against the data. Both showed a significant correlation between frequencies for participation between the two media. The Pearson correlation value was 0.670 and the Spearman rho was 0.739, both of which were statistically significant at the 0.01 level, for a two-tailed test.

This finding is particularly important for this analysis since it supports the conclusion that participation rates are more a function of the individual (a trait) than of the media that is being used by the individual to communicate (a state).

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Question 4: Has Observation Affected This Class’s Participation Rates?

In a classroom situation, it would be virtually impossible to test whether the fact of being observed has affected participation rates because the act of gathering data could not be separated from the effect being studied without employing deception. In an effort to ascertain if there is any evidence that knowledge that they were being observed affected communication behaviors for this class, a comparison was made of this class’s discussion board activity level with that of the preceding two years in which the class was taught but in which no data about comparative participation rates were collected. In all cases, students were required to participate in five discussion boards, with a recurring set of 8–10 classmates throughout the term. The discussion topics for the 2007 and 2008 classes were the same. The discussion topics for the 2006 class overlapped but were not in all cases the same. Because the number of participants per topic varied both within and across years (see Table 2), the analysis used the average number of posts per discussion topic per year.

A one-way analysis of variance showed significant variation among years (p < 0.05). A follow-on Tukey HSD was performed. It showed no significant differences between the 2006 and 2008 class years, with the observed difference in the ANOVA being the result of higher participation rates in the 2007 class year. The lack of a difference between the 2006 and 2008 classes’ discussion board participation rates itself suggests a lack of any significant effect of observation on the behavior of the 2008 class that was the object in this study.

Discussion

It is widely believed that classroom instruction is more effective when students are actively engaged in the educational process. One common measure of active engagement is participation in class-related discussions. The form of participation may be oral discussion in face to face classes or written commentary using CMC, including synchronous computer-based meetings or asynchronous discussion boards, email or other media.

While active participation may be an indication of student involvement, this paper suggests that the level of participation may be affected by factors other than student engagement. In the literature review, we have shown that factors related to fear or anxiety (apprehension) about communicative acts can be shown for both in-class participation and computer-mediated information exchanges. First shown in studies that demonstrated individual differences in anxiety about talking aloud (e.g., giving presentations, asking questions) in face-to-face classrooms, this tendency is referred to as (classroom) communication apprehension (CCA). More recently, with the growth in the use of computer-based tools in educational settings, new forms of CA have been identified. These are referred to as computer-mediated communication apprehension (CMCA). In previous studies, both CCA and CMCA have been shown to be negatively correlated with the frequency of communicative acts in face-

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Effects of Communication Medium on Class Participation

to-face classrooms and in asynchronous discussion boards.

The data gathered in the present study demonstrate that participation levels in face-to-face and online discussion boards can vary together. The observed significant positive correlation in the participation rates in both in-class discussions and asynchronous discussion boards supports the conclusion that participation is better conceptualized as a pervasive personal trait, rather than as a state that can be affected by the medium through which communication happens. In addition, it suggests that CA is not easily diminished by the use of asynchronous media but rather that it is a generalized response to the demand that the individual participate.

This has implications for educational practice. Differences in "classroom loquacity" (Williams, 1971) or discussion board participation cannot be assumed to directly measure student involvement or learning. Rather, participation rates reflect a complex set of factors, some of which can be based in personality or cultural differences. If instructors choose to use participation rates to determine a significant portion of a student’s grade, they should be aware that participation rates may not be a reliable indicator of that student’s involvement or learning.

Assumptions that CMC media will necessarily ameliorate CA are not supported by research. We should not be misled into thinking that allowing students to interact through asynchronous, CMC media will allow students to participate more freely in class discussions. Computer-mediated communication apprehension, too, may affect students' ability to reveal the depth of their involvement. This is particularly important for LIS education which has moved strongly to the online environment. Believing that a change in communication medium will necessarily enable students to participate more fully in class does not make it so. Educational practice should, wherever possible, be based established research rather than on beliefs or opinions about researchable effects.

References


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