Crossing the Communication Barrier: Facilitating Communication in Mixed Groups of Deaf and Hearing Students

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Abstract

Teachers of introductory technical courses such as statistics face numerous challenges in the classroom, including student motivation and mathematical background, and difficulties in interpreting numerical results in context. Cooperative learning through small groups addresses many such challenges, but students for whom spoken English is not their primary language – which may include international, first generation Americans, and deaf or hard of hearing students – are less likely to benefit from group work. This paper examines two possible approaches to improve communication in groups where there is a mix of deaf or hard of hearing students and hearing students for whom English is their native language.

Keywords: Group work, communication, deaf, hard of hearing

Introduction

Among the challenges facing teachers of introductory technical courses such as statistics are the low motivation and insufficient mathematical backgrounds of students (Onwuegbuzie, 1997), as well as obstacles in communication related to the dependence of interpretations on language (Rangecroft, 2002). Student engagement is a factor that has been associated with increased learning outcomes (Carini, Kuh, & Klein, 2006), and one approach to increasing student engagement, cooperative learning through small group work, is widely used at all levels of education (de Corte, 2004; Jenkins, Antil, Wayne, & Vadasy, 2003). For example in statistics education, benefits of group work include practice with statistical skills and communicating in the language of statistics (Roseth, Garfield, & Ben-Zvi, 2008). Since language is a primary tool for participation in group work (Lerman, 2001), students who struggle with verbal communication are less likely to benefit from group work (Webb, 1989, 1991; Webb & Farivar, 1994). Deaf and hard of hearing students report classroom communication in general as a challenge (Stinson, Liu, Saur, & Long, 1996). The difficulty with communication often leads to student passivity (Saur, Layne, Hurley, & Opton, 1986), with the result that deaf and hard of hearing students learn less than their hearing peers (Richardson, Marschark, Sarchet, & Sapere, 2010).

Add to this the inherent challenges associated with group work (Roseth et. al., 2008), including having one student performing most of the work or students working completely independently. International, first-generation Americans, and deaf or hard of hearing students may communicate more comfortably in a language other than spoken English. When such students are integrated into work groups within a classroom, the potential problems may be magnified. This paper examines two possible approaches to improving communication and student learning in groups where there is a mix of deaf or hard of hearing students and hearing students for whom English is their native language. The study is exploratory with the goal of identifying potential interventions for more intensive research.

Background

In the past 25 years, the number of deaf and hard of hearing students enrolled in postsecondary programs has increased dramatically. The most recent statistics available from the National Center for Health Statistics reported that there were more than 26,000 deaf and hard of hearing students enrolled in college and university programs in the United States in 1999 (Marschark, Lang, & Albertini, 2002). A majority of these students received their education in mainstream classes alongside hearing classmates (Lang, 2002; National Center for Education Statistics [NCES], 2000). However, recent statistics indicate that approximately 70-75% of deaf and hard of hearing students enrolled in postsecondary programs fail to complete them. This is more than twice the 30% attrition rate of hearing students (Marschark, 2007; Stinson & Walter, 1997).

Due to the presence of the National Technical Institute for the Deaf (NTID) on our campus, Rochester Institute of Technology (RIT) has approximately 500 deaf and hard of hearing students registered in "mainstream" RIT classes each quarter; that is, classes that are not strictly for NTID students and where the instructors do not teach using American Sign Language (ASL). Deaf and hard of hearing students often have poorer written English skills than their native English language hearing counterparts. Students who identify themselves as "deaf" may communicate through ASL and/or read lips and voice for themselves. Those who identify themselves as "hard of hearing" may use a hearing aid and/or FM amplification system, ASL, lip reading, or voice. Support for these students is most often provided through professional sign language interpreters and note takers in the classrooms. This arrangement, designed for traditional lecture courses, meets the minimum requirements by law in providing equal access to deaf and hard of hearing students. But with the introduction of active learning and group work in many courses, the model of communication only through a third-party interpreter has limitations, particularly in classes with a large percentage of deaf and hard of hearing students. Although one or two interpreters may be assigned to a class of 35 students, when there are more than two student work groups using mixed modes of communication, there cannot be an interpreter assigned full time to each group. In these situations, the interpreters will do their best to join groups when their support is requested but they cannot remain in one group for the entire class.

The solution used by some instructors is to place all of the deaf students in their own work groups. But this can place these students at a disadvantage, for they may all be relying on the note-taker's notes which are not available until after class, and they may miss "overhearing" important information from other groups in the room (Powers, Gregory, & Thoutenhoofd, 1999). Student work groups have been shown to benefit from diversity within the group (Webb & Palincsar, 1996) – men and women, a variety of skill levels, and different backgrounds. By mixing deaf/hard of hearing and hearing students, we better mimic the working environment of the hearing world where spoken English is widely used and allow all students in the group to experience diversity and gain from it. For deaf and hard of hearing students in mainstream classrooms, participation is linked to academic success (Antia, Sabers, & Stinson, 2007). However, numerous challenges to communication exist in mixed groups of deaf/hard of hearing and hearing students (Stinson et al., 1996). For these groups, the communication and group activities are often slowed and, at times, the communication process becomes frustrating, lowering the morale and motivation within the group.

Although deaf/hard of hearing students do use interpreters to access the comments of hearing members, issues such as the processing time between when a hearing student finishes talking and when the interpreter finishes conveying the message frequently limit the deaf/hard of hearing member's participation. Furthermore, observation of mixed groups of deaf/hard of hearing and hearing members indicates that in small groups, members often communicate directly with each other instead of through a service provider (Stinson & Liu, 1999). Unfortunately direct communication between deaf/hard of hearing and hearing students is often difficult and makes participation by all members of the group a challenge. This direct communication is difficult because the deaf/hard of hearing member usually cannot understand all of the spoken communication of the hearing members, the hearing members may not be able to understand the deaf/hard of hearing member's speech, and the hearing members usually do not know sign language, which deaf/hard of hearing students often use to communicate. Furthermore, an interpreter is often not immediately available to assist all students (Stinson & Liu, 1999). For these reasons, it is important for educators to find better ways to support communication and learning when students with communication challenges and other students collaborate.

An RIT statistics professor and NTID researchers collaborated to develop intervention approaches with the intention of increasing the participation and learning of all students during group activities. The goal was to help groups work inclusively, quickly, and correctly, and to improve the students' learning experience. This paper discusses the preliminary implementations and evaluations of two interventions – use of the existing classroom whiteboard and use of tablet PC's. They were selected because they represent two kinds of possible interventions. The whiteboard is standard in many classrooms today and is therefore easily available to most instructors. It requires little or no training to use, no cost to the instructor, and no technical support; in short, it is extremely "low tech" and accessible. However, it is limited in its capacity to store and transfer information, and cannot be taken from the room upon completion of the group task. The tablet PC, on the other hand, is a more "high tech" tool. While now quite common on the campus, tablets are generally an individual tool and not configured as a visual way to share communication on a group task. The tablets used in this project include specialized software that allows wireless communication between students as well as the opportunity to share and save written work. These features enhance the usefulness of tablet PC's in these settings but require money and training on use of the software. In short, each of the interventions has advantages and disadvantages.

Methods

The instructor introduced the interventions in two sections of the same algebra-based introductory statistics course at RIT; one in the 2007-2008 academic year, the other in 2008-2009. Both sections were taught by the same instructor and used the same material and group work format. Each section had 35 students, 10 or more of whom were deaf or hard of hearing. Each two-hour class session was divided into an hour for lecture to introduce a topic, followed by an hour of group work.

Group work consisted of a variety of activities, including skill practice, problem solving and concept discovery. The instructor circled the room, answering questions, and guiding groups of four students. The interpreters also circled the room to provide communication support where needed, most often following the instructor when she worked with a group that included deaf, and/or hard of hearing, and hearing students.

Students had to complete an individual copy of the day's worksheet for their own records and submit a single group worksheet by the end of the class to be graded. Historically, group grades were very good for the worksheets, but when individuals asked questions outside of class, it was clear that not all students left the group understanding the material. A typical mixed-group had two deaf or hard of hearing students and two hearing students; the hearing students were all native English speakers and did not know ASL. The remainder of the groups consisted of all hearing students. Groups worked together for four weeks (until the first exam) without changes in group structure. Following the first exam in week 5, the instructor reassigned groups, placing students in the new groups to create a mix of student abilities based on exam performance.

After forming the new groups, the instructor chose two groups to use the whiteboard along with other communication methods (e.g. speech, use of interpreter, etc.) to work through problems and communicate with each other. An effort was made to select groups in which the preferred methods of communication were varied. Students in these groups were contacted by the instructor who explained the intervention to them and said they could be reassigned to another group if they preferred not to participate, emphasizing that there was no penalty for not participating. All but one student agreed to participate and this student changed places with a student in another group. The instructor provided the two groups with dry erase markers and a section of the classroom with a whiteboard, and encouraged them to use the board instead of their individual worksheets. This allowed all members of the group to clearly see the work-in-progress. While the instructor did not restrict students to only using the whiteboard for communication, this was the primary mode they used. Interpreters were available to assist these groups as requested. However, since these groups did have a communication resource available to them, they did not seek interpreter support as often as other groups. For the most part, the interpreter only worked with the whiteboard groups when the instructor was communicating with students in the group. A scribe within the group recorded their work for submission to the instructor, and the completed worksheet was scanned and emailed to group members after class. The whiteboard groups used this approach during weeks 5-6 of the course (four classes). After this period, they could choose to continue using the whiteboard, or return to working at a table.

After completion of the two-week whiteboard intervention, the instructor chose different mixed-groups to use tablet PC's for working on assigned problems and communication, again contacting the students and noting that that participation was voluntary. The C-Print Pro software (National Institute for the Deaf [NTID], 2011) for tablets permitted students on multiple PC's to view the group worksheet and to make contributions to the group work. They were also able to send the instructor the group worksheet electronically at the end of class, which permitted the instructor to provide feedback more efficiently and quickly. Students who were in these groups were required to attend a half-hour orientation period in which they received instruction and practiced using the tablet PC. Technicians loaded the group worksheet onto the PC's before class. In one class session, each of the two groups of four students (two hearing; two deaf or hard of hearing) used a single tablet PC. The separate groups were not networked to each other. In the other session, one group used a pair of wirelessly networked tablet PC's for a two-to-one student to PC ratio. Technicians provided support at all class sessions. Following each class session, the instructor reviewed and emailed the completed electronic worksheet to all group members. The PC groups used the intervention during week 8 of the 10 week quarter (two classes).

Members of the project team took turns observing the classes when the interventions were being used. They wrote field notes describing the interactions among students in intervention groups as well as the interactions in all hearing groups. Notes were used to document how students were using the whiteboard and computer tools. In particular, notes were taken describing how students used these tools to communicate with one another and to share their work in completion of assigned tasks.

At the conclusion of the interventions, the research team sent students from both the whiteboard and PC groups a follow up electronic survey. A week later reminders were sent to those who had not yet responded, resulting in a 100% response for both interventions (N = 16 responses for the whiteboard intervention and N = 12 responses for the tablet PC intervention). The survey questioned students on a range of topics, including how consistently they used the intervention, how they felt the interventions improved the learning experience, what they liked about the intervention, and what could be improved (see Appendix A for the whiteboard survey and Appendix B for the tablet PC survey). Students were also asked to identify themselves as deaf, hard of hearing, or hearing.

Results

Figure 1 (a - d) shows the response distributions for deaf/hard of hearing, and hearing participants using the whiteboard strategy over the two-year period. Because the number of participants is small in this study (2 hard of hearing, 6 deaf and 8 hearing), the responses of deaf and hard of hearing students were combined for analysis. In answering the question about communicating with other group members, hearing students more frequently gave "often" or "always" ratings, and deaf/hard of hearing students equally distributed their ratings among four of the five alternatives ("sometimes" to "always"). For the question about participation in group work, deaf/hard of hearing and hearing students most frequently assigned the "often," rating.

All students thought the whiteboard helped them learn the material. However, the hearing students were more varied in terms of how much it helped (Figure 1c). Additional examination of the data (not shown in the Figure 1) revealed that students who identified themselves as hard of hearing on the survey were more positive about the intervention than those who identified themselves as deaf with respect to communication and participation. Most students (75% of both hearing and deaf/hard of hearing) were willing to try this strategy again; the remainder indicated that they might be willing to try again (Figure 1d).

The numerical survey data were also supported by students' responses to the open-ended questions. Student comments on the surveys indicated that use of the whiteboard allowed more space for working through problems together, got individual members of the group more involved, and enhanced communication by making it more visual. Some examples:

> "The fact that it led to open group discussion and it brought the group together as a team." (Dennis, hard of hearing student)

> "We could record what the other group members thought of solutions to the math problems and it helped me because it was a visual learning experience so it was very beneficial on my end." (Dennis, hard of hearing student)

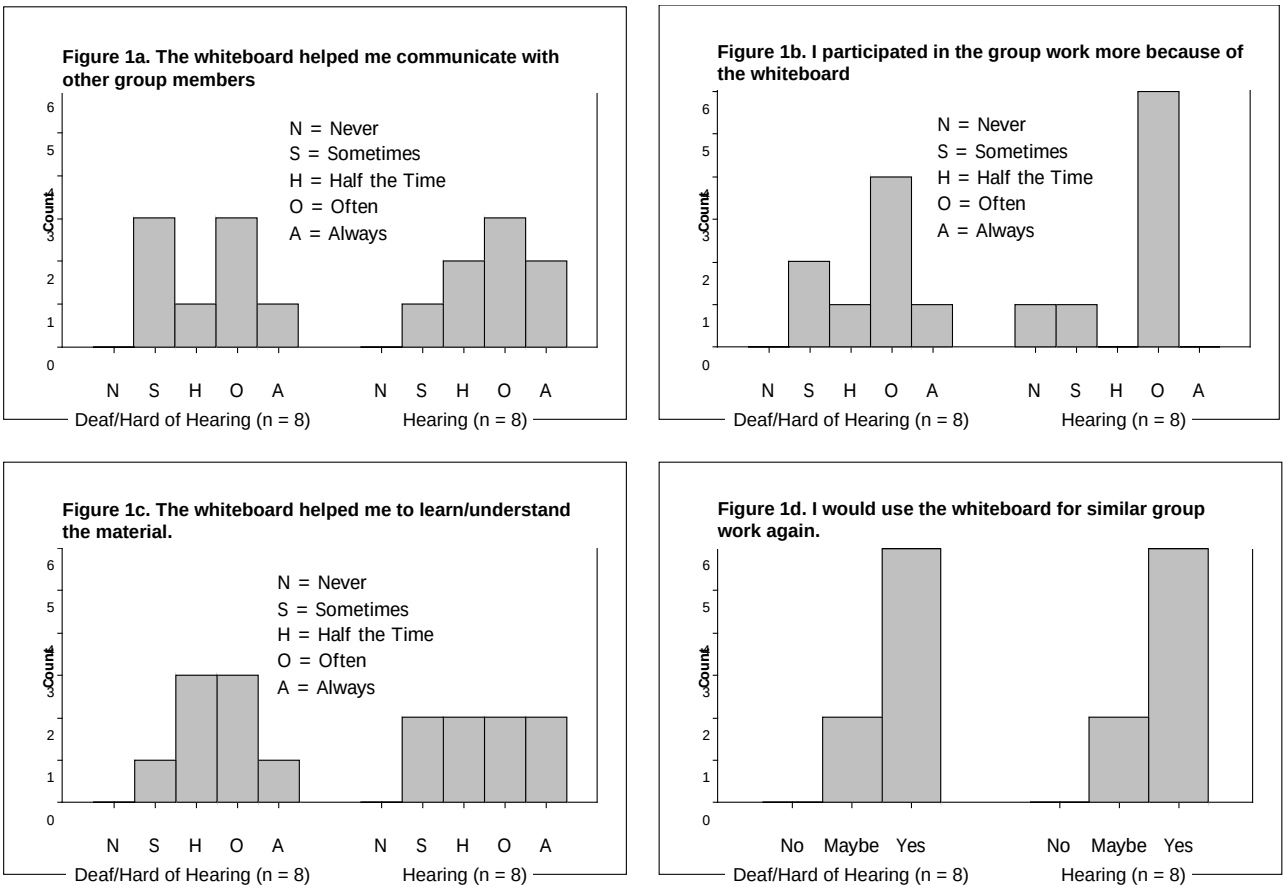

Figure 1. *Response distributions for the whiteboard strategy (N = 16)*

"One of things I like about using the whiteboard strategy was that I was able to see others work and understand the concept better related to the topic. For example, today we were working on hypothesis testing and I was able to see a group member solving problems on the whiteboard." (Tom, deaf student)

"Using the whiteboard made working in the group a much more open experience, and people were more driven to pay attention and be involved with work. There were days when I didn't feel very much like pulling my weight, but with the whiteboard, there was more pressure to contribute." (Jane, hearing student)

"I prefer the whiteboard method because it was easier to understand our mistakes and see what the other groupmates felt about the answers or whatever that was written." (Stacy, deaf student)

In 2007-2008, both groups who used the whiteboard elected to return to working at their tables without the whiteboard following the intervention. However, in 2008-2009, students in the intervention groups chose to continue using the whiteboard approach for the remainder of the quarter. In both years, most students felt that communication was quicker and easier with the whiteboard and that they learned more using this approach. Based on student suggestions from the first year, the option of using an overhead projector to cast the worksheet image onto the whiteboard, in addition to writing their work there, was added in 2008-2009. One whiteboard group chose to use this option, the other did not. The group that projected the worksheet onto the whiteboard felt that it helped to keep group members on the task at hand. As one student wrote, "Projecting on the whiteboard helped us all view the worksheet without going back and forth to our handouts." Although the whiteboard approach seems to hold promise, it has its limitations. For example, all groups expressed concern that their work was visible to the

entire class and some complained that it took longer to complete the group assignment.

The tablet PC survey (Appendix B) followed the same format as the whiteboard survey, but used separate questions to collect feedback regarding communication with deaf group members and communication with hearing group members. Figure 2 (a - e) shows the response distributions for deaf/hard of hearing, and hearing participants using the tablet PC intervention over the two-year period. Students felt that the tablet PC helped to varying degrees in communicating with group members (Figures 2a and 2b). For hearing students, the responses were similar for communication with deaf as well as other hearing group members. Deaf and hard of hearing students felt that the tablet PC facilitated communication with hearing group members, but they were split about the effect on communication with deaf group members. Those students who identified themselves on the survey as hard of hearing gave the most positive responses, possibly due to a higher

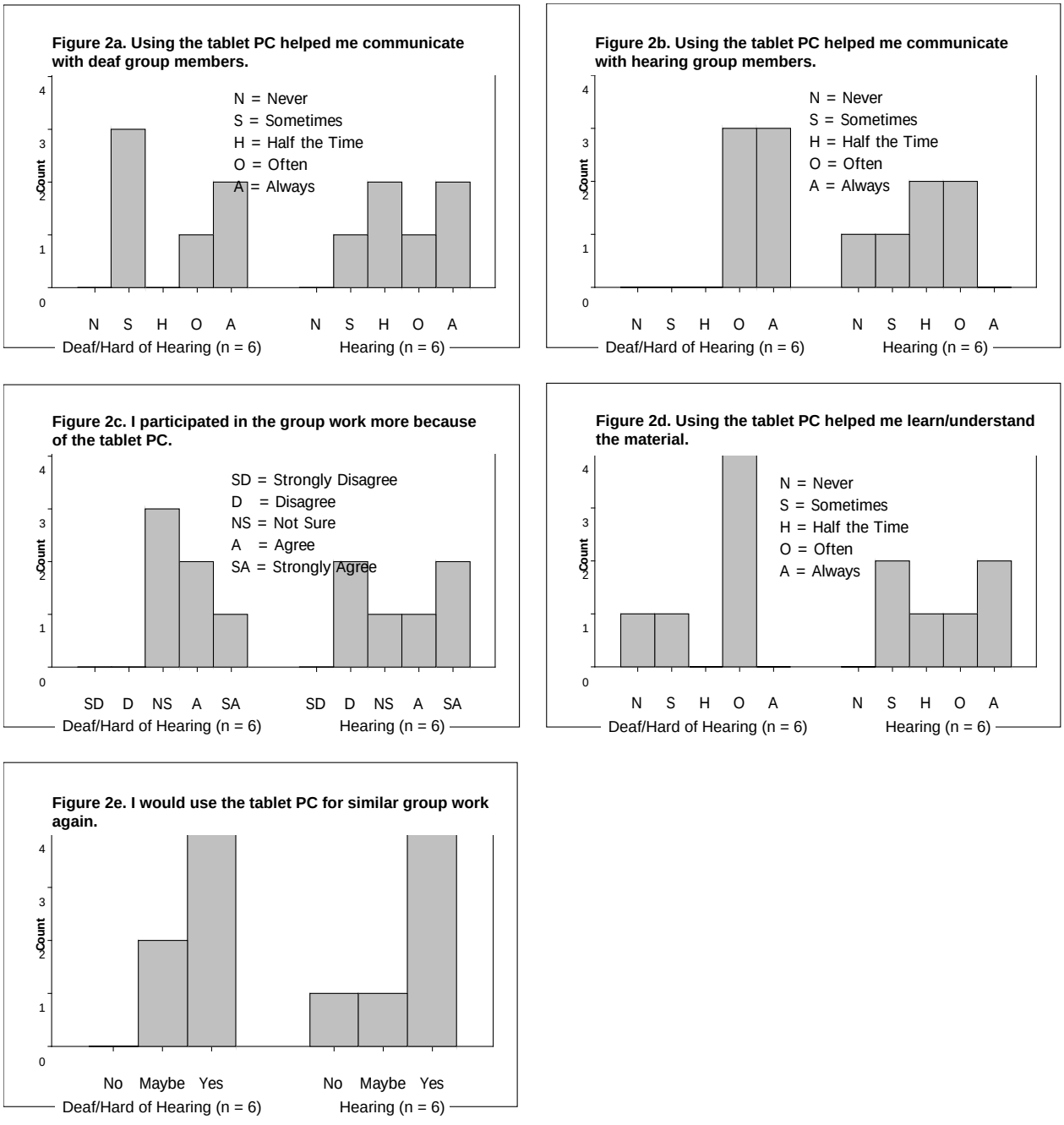

Figure 2. *Response distributions for the tablet PC strategy (N = 12)*

level of comfort with written and spoken English (Stinson et al., 1996). The effects on student perception of participation and learning were varied with use of the tablet PC (Figures 2c and 2d). However, 66% of all the students indicated they would be willing to try this strategy again (Figure 2e).

In the first class session with the tablet PC, there was only one tablet PC per group, and a single member of one group "took over" the activity by writing all the answers and not showing the others. With two tablet PC's per group, this did not occur. All students felt that group work was enhanced by using the PC's. Comments included the following:

> "[There was] more interaction among group members." (Larry, hard of hearing student)
>
> "That it helped us see and understand more clearly what was being written doing by the group members because in my case I couldn't understand the hearing people half the time so it was very visual for me to learn and view the tablet PC, so therefore it was beneficial." (Grace, hard of hearing student)
>
> "When we used the tablet PC, I felt as though our group worked more as a team." (Rita, hearing student)
>
> "[The tablet PC's] allowed the whole group to focus together on one thing." (Patty, hearing student)
>
> "I think it helped with the deaf peers because the whole group was focused on one worksheet and working together to finish it. I think that not having to fill out your own worksheet allowed for better team work. The tablet PC was useful in creating neat, accessible copies of each worksheet for each member." (Patty, hearing student)

The learning curve for the technology – getting used to the slower writing on the tablet PC and, in 2007-2008, trial and error to determine the best format to email the completed worksheet – caused some frustration for the student participants, who wanted to complete the in-class work and get feedback as quickly as possible. However, use of the tablet PC did not leave the groups feeling as though their work was exposed to the rest of the class.

Discussion

Both the "low tech" and "high tech" strategies hold potential. The whiteboard approach was easier to implement, required no training, is portable to almost any classroom, and was favored by the hearing and hard of hearing students. With many groups in the class, there may not be enough room for all groups to use the classroom whiteboard. However, small whiteboards for each group may be a viable alternative, and might reduce or eliminate the student concern that others could see their work. Students liked the novelty of the tablet PC's and the enhanced communication they provided. But this intervention was more difficult to implement, requiring access to the proper equipment and software, out-of-class training, and technical support. A "mid-tech" intervention, such as a smart board, was not available to the authors, but may prove to be another avenue for further investigation.

This study did not examine specific learning outcomes. This is a natural and necessary area for future research. Predictably, the small samples in this preliminary study did not show statistical significance. Use of larger samples will increase the power of these tests and provide more reliable measures to answer research questions. Although it has been suggested that deaf and hard of hearing students may not be comfortable using written English to communicate without an interpreter, written communication is a realistic alternative for work, school, and social situations. With the emergence of text messaging as a form of communication, many students are already comfortable expressing themselves using written messages and many deaf and hard of hearing students are enrolling in online courses where communication with the instructor and other students is text-based.

Research suggests that instructional improvements intended for a specialized group often benefit all students in the classroom (Pliner & Johnson, 2004). Hence, interventions to improve communication, participation, and learning for deaf and hard of hearing students may well serve hearing students. In particular, hearing students for whom English is a second language, who come from cultures in which communication norms are different than those in the U.S. or have challenges involving speech (i.e., students who stutter, have Tourettes, vocal chord injuries, paralysis, etc.) or social interaction (i.e., Aspergers) may benefit from alternative communication tools for group work.

Continued work will examine both "best practices" and "best *practical* practices" for instructors. Potential ideas include creating a whiteboard surface for some tables, or a lazy-susan whiteboard to allow students to rotate their work for sharing. Incorporating students into brainstorming sessions could generate additional ideas for using a whiteboard in a group work situation. Finally, assessing the technique with groups of hearing students will help determine if the whiteboard is truly a universal design tool.

Limitations of this Study

This exploratory work was conducted to examine the potential usefulness of two distinct tools for group work in mixed communication teams. The number of participants was small and the duration of the interventions was short. The small number of students required combining students who self-identified as deaf with those who self-identified as hard of hearing. There were differences between these two groups – the hard of hearing students tended to be more satisfied with the interventions than the deaf students – but with only two hard of hearing students using the whiteboard intervention and three using the tablet PC intervention, one could draw no conclusions from this finding. The PC groups had such a short time to learn and use the technology that it is difficult to know whether their responses were overly influenced by the normal frustrations that occur when there is a learning curve involved in using a new tool. In short, this project is intended to illuminate possible areas for further study.

Recommendations for Further Research

Further research is recommended to include larger numbers of students and longer durations for interventions. Additional measures to evaluate student progress with the interventions and learning outcomes should be incorporated into the research design. The potential for universal design applications deserve additional attention, also. That is, all students could be asked to provide anonymous information regarding their disability status to learn whether the interventions may be helpful to other special populations of postsecondary students.

This study focused on communication in mathematics workgroups where symbols are often the language of communication. It is recommended that other STEM disciplines be studied using these interventions, as well as the fields of social science and business. Most disciplines today employ team or group work as a strategy for problem solving in postsecondary education *and* in the workplace. Since both settings are crucial to long-term career success, it is suggested that research should be conducted in both settings to determine if tools developed for use in higher education could be applied in employment settings.

Some of the suggestions described above will be implemented in 2011-2012. The project team will study two sections of the same statistics course with the same instructor, materials, and group work format using a modified whiteboard approach. One section of the class will continue in the traditional manner (without communication intervention) while the other section will use whiteboards for all workgroups throughout the entire twenty-session course (including both mixed communication groups and groups comprised of only hearing students). In this study the whiteboards will be on the tables, eliminating student concerns regarding other students observing their work. The challenge will be to use the boards in a way that still enables students to view fellow group members' work easily. This iteration of the project will include measures of learning outcomes as well as student surveys and class observations. The experimental design includes all students in two sections of the course, allowing us to examine the effect of the intervention for groups of hearing students as well as for mixed groups of deaf/hard of hearing and hearing students. In addition to hearing loss, we will ask students to self-identify any other disability, thus providing the possibility for comparisons among multiple types of student groups.

The tablet PC software team that participated in the exploratory studies will initiate a new project in 2011 to enhance the product's ability to support deaf, hard of hearing, and hearing students in workgroups. This project will modify existing software (C-Print Pro) to support collaborative communication and learning of students. Features that the software may include will enable collaborating students to create, view, and save shared documents in text, graphical, or combined text-graphic formats. Collaborators will use two or more computers that communicate with each other in a wireless network. These students may be able to simultaneously view each other's additions and modifications to documents. The tool's software may also allow quick insertion of a variety of electronic media into the shared documents, including instructor-produced worksheets, and website pages. Students may also use, in addition to speech, sign, etc., a graphic- or

a text-messaging feature to communicate directly with each other. Thus, this approach, while having more technological requirements than the whiteboard, may give students a more powerful tool for communicating and working together. For example, students will have the capability to save work in electronic files in a manner that is not possible with the whiteboards. This project is starting with collection of extensive data from students and instructors regarding crucial features to be included in the enhanced software and will then develop and field-test these improvements in educational settings.

Clearly, RIT presents a rich context for studying academic interactions among deaf, hearing, and hard of hearing students. Few other postsecondary educational institutions have so many deaf or hard of hearing students. However, the interventions being developed for group work at RIT should work equally well in settings where there are only a handful of deaf students. In fact, they may be more crucial in these settings since the option of placing multiple deaf students in the same group to facilitate communication is rarely a possibility, and in rural settings it is frequently difficult to find fully certified interpreters. We hope that researchers at other universities may be interested in conducting research at RIT regarding applications of the tools we are developing and testing, and welcome contact from possible collaborators.

Conclusion

This exploratory study yielded interesting findings that need further investigation. Overall, the implication for educators is that we can improve the student experience (and possibly, learning outcomes) in collaborative work groups by providing alternative methods of communication. Portable whiteboards provide a simple, inexpensive method, and tablet PCs with special software may provide powerful tools, to facilitate such communication, encourage participation, and improve the learning experience for all students.

As educators, it is imperative that we continually explore instructional strategies that have proven benefits for student learning. Additionally, since most classrooms today are multicultural and include learners with a variety of learning styles and needs, it is important to study the potential of interventions for universal design and application. As a result, our future research will expand upon the exploratory work reported in this paper to document the impact of the whiteboard tool for all students, including those who are deaf, hard of hearing, or hearing, and will include tests to measure learning outcomes with and without whiteboard conditions for all students.

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Appendix A

Survey Questions from the Whiteboard Intervention

1. I am

   ___Deaf ___Hard of hearing ___Hearing

2. Our group used the whiteboard to do the group work during the time we were asked:

   ___Never ___Sometimes ___Half the time ___Often __Always

3. I participated in the group work more because of the whiteboard strategy:

   ___Never ___Sometimes ___Half the time ___Often __Always

4. The whiteboard strategy helped me to communicate more easily with other group members:

   ___Never ___Sometimes ___Half the time ___Often __Always

5. The whiteboard strategy helped me learn/understand the material:

   ___Never ___Sometimes ___Half the time ___Often __Always

6. I would use this strategy again

   ___No ___Maybe ___Yes

7. One of the things I liked about using the whiteboard strategy is…

8. One of the things I did not like about using the whiteboard strategy is…

9. Did using the whiteboard help you communicate with your hearing/deaf peers? Please explain your response.

10. You tried the whiteboard strategy and also, in the past you worked at the table without using the whiteboard. Which did you prefer? Why? How were these two strategies different from each other? How were they the same?

11. How could the whiteboard strategy be improved?

12. Any other comments?

Appendix B

Survey Questions from the Table PC Intervention

1. I am

   ___Deaf ___Hard of hearing ___Hearing

2. Our group used the tablet PC to do the group work during the time we were asked

   ___Never ___Sometimes ___Half the time ___Often __Always

3. Using the tablet PC helped me to communicate more easily with other deaf group members

   ___Never ___Sometimes ___Half the time ___Often __Always

4. Using the tablet PC helped me to communicate more easily with other hearing group members

   ___Never ___Sometimes ___Half the time ___Often __Always

5. Using the tablet PC helped me learn/understand the material:

   ___Never ___Sometimes ___Half the time ___Often __Always

6. I participated in the group work more because of the tablet PC technology

   ___Strongly Disagree ___Disagree ___Not Sure ___Agree ___Strongly Agree

7. I would use the tablet PC to do similar group work again

   ___No ___Maybe ___Yes

8. One of the things I liked about using the tablet PC is…

9. One of the things I did not like about using the tablet PC is…

10. Did using the tablet PC help you communicate with your hearing/deaf peers? Please explain your response.

11. You tried the tablet PC and also worked at the table without using the tablet PC. Which did you prefer? Why?

    How were these two strategies different from each other? How were they the same?

12. How could use of the tablet PC for the group work be improved?

13. Was it better to have two tablet PCs or one? What is the reason for your preference?

14. Any other comments?