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Inclusive Instruction and Learning for Deaf Students in Postsecondary Education

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This article explores how students who are deaf and their instructors experience mainstream college classes. Both quantitative and qualitative procedures were used to examine student access to information and their sense of belonging and engagement in learning. Instructors were asked to discuss their approach to teaching and any instructional modifications made to address the needs of deaf learners. Results indicate that deaf students viewed classroom communication and engagement in a similar manner as their hearing peers. Deaf students were more concerned about the pace of instruction and did not feel as much a part of the “university family” as did their hearing peers. Faculty generally indicated that they made few if any modifications for deaf students and saw support service faculty as responsible for the success or failure of these students. We discuss results of these and additional findings with regard to barriers to equal access and strategies for overcoming these barriers.

Deaf students are attending mainstream postsecondary educational programs in ever increasing numbers. Currently, 20,000 deaf and hard-of-hearing students are mainstreamed in approximately 2,360 postsecondary programs (Lewes, Farris, & Greene, 1994). We have come a long way in terms of providing support services such as interpreters, notetakers, and tutors. Yet we have not systematically documented what works and does not work regarding full inclusion of this population. There is always the danger that instructors and students will perceive the presence of support services in

their classes as “full accommodation.” In fact, this is only the first step. In this article, barriers to inclusive education for deaf postsecondary students, as well as strategies for overcoming barriers, are explored. Findings are presented from an ongoing program of applied research at a large postsecondary program that focuses on inclusive education for deaf students enrolled in mainstream classes.

The article is organized into four sections. In the first section, background information is provided regarding legislation that has had an impact on mainstreaming students with disabilities at the postsecondary level, as well as selected literature on the topic of inclusive education. The second section describes the design of the research, including subjects and methodology. The third section presents research results. The article concludes with a discussion of the implications of this research for inclusive education of deaf students at the postsecondary level.

Background

During the two decades following passage of the Individuals with Disabilities Education Act (IDEA), educational program reform at the local and state levels increased dramatically. The primary goal of the legislation and subsequent reform was to ensure that all students shared equal educational opportunities and access to the same “general” curriculum. According to the U.S. Department of Education (1997), three times the number of young people with disabilities are now

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enrolled in colleges or universities. However, the Department of Education also acknowledges that many children with disabilities remain excluded from the general curriculum.

From discussions of inclusive education (e.g., Chalmers & Olson, 1995), its characteristics (e.g., Dalheim, 1994), and strategies for implementation (e.g., Falvey, 1995), four themes emerge: (1) an inclusive environment can be conducive to learning for all students, (2) some teaching styles are more consistently connected with an inclusive environment, (3) the personal learning styles of students need to be considered in programmatic design, and (4) mere physical proximity is insufficient to achieve the goal of inclusion. Unfortunately, outcome-based evaluations of the efficacy of inclusive education in achieving its goal—equal opportunity and access to the general curriculum—continue to lag behind program reform.

As a member college of the Rochester Institute of Technology (RIT), the National Technical Institute for the Deaf (NTID) is in a unique position to identify the efficacy of inclusive education in achieving the goal of equal opportunity and access to the general curriculum. More than 400 deaf students who are fully matriculated in the other six colleges of RIT receive support services through NTID. Thus, RIT/NTID has a wealth of experience and expertise in providing tutoring, note-taking, and interpreting for students who are deaf.

Several outcome-based studies of inclusive education conducted at NTID support the observation that mere physical proximity often promotes only the illusion of integration and that additional accommodations may be necessary to overcome less obvious barriers (Foster & Brown, 1989; Foster & Walter, 1992; Saur, Popp-Stone, & Hurley-Lawrence, 1987). In a reflective essay written from the perspectives of a hearing instructor and a deaf student, Foster and Holcomb (1990) explored the importance of grapevine information and student rapport in university settings, noting that both are difficult for deaf students to access. Other research at NTID has focused more specifically on the cognitive and affective dimensions of classroom communication and engagement. In this vein, it was found that as students feel at ease with their communication with teachers and peers, they see themselves as having control in the educational setting and are more likely to

become engaged, active learners (Braeges, Stinson, & Long, 1993; Garrison, Long, & Stinson, 1993; Long, Stinson, & Braeges, 1991; Stinson, Liu, Saur, & Long, 1996). These and other studies suggest that, even with a comprehensive program of classroom support services, access to classroom communication is a unique challenge for deaf students. Here are examples:

1. Deaf students using an interpreter experience a “lag time” in receiving information. The interpreter will finish signing what has been said about 5–10 seconds after the speaker stops speaking, which can exclude deaf students from participating, since by the time the student has received the full message the instructor has already identified and called on someone else.

2. Deaf students may rely on speechreading for information. Yet instructors often break visual contact between the student and their speech while writing on the board, reading from papers held too close to their faces, or pacing back and forth.

3. In labs or computer courses, instructors may speak while manipulating physical objects or performing tasks on a projected screen. Deaf students must choose whether to watch the interpreter or the instructor/screen, losing half the information.

4. Deaf students are rarely included in informal exchanges among hearing students regarding instructor expectations, study tips, and unspoken rules for class behavior and organization, thus missing important but “unpublished” information.

These examples demonstrate that there is more to inclusive instruction than physical proximity and the provision of support services. Informal conversations, instructor styles and behaviors, student interactions, and the nature of the information being conveyed subtly but significantly shape the teaching and learning experience. In this article the focus is on these less obvious but equally important components of educational access.

The purpose of this study is to describe conditions that affect access to teaching and participation in learning by deaf postsecondary students in mainstream class settings. Critical areas explored include the perceptions of deaf and hearing students regarding communication and engagement within the class and the per-

ceptions of instructors regarding their teaching experiences with deaf students. We hope that this research will lead to the identification of strategies and conditions that enhance full academic access and accommodation of mainstream deaf college students.

Method

During the 1996/1997 academic year, instructors and support faculty working with deaf RIT students majoring in business, computer science, or information technology were invited to participate in a collaborative study of academic mainstreaming. Quantitative and qualitative research methods were used to collect data from students, instructors, and support faculty regarding academic inclusion. Quantitative tools include the Academic Engagement Form (AEF) and the Classroom Communication Ease Scale (CCES). Interviews were conducted with instructors using qualitative methods.

Academic Engagement Form. Engagement refers to the extent that students' efforts, persistence, and emotional states during learning activities reflect a commitment to learning and successful academic performance (Skinner, Wellborn, & Connell, 1990). Engaged students show persistence and interest in academic tasks and tend to achieve academic success. In this study, students were asked to respond to 114 items designed to assess affective and behavioral aspects of engagement. Items look at aspects of active learning, perceptions of teachers, strength of association with other students in class, and feelings of belonging at RIT. These items were adopted from the Rochester Assessment Package for Schools (RAPS), an instrument designed to assess a number of motivational dimensions with hearing students (Skinner et al., 1990). Additionally, students were asked four open ended questions covering class participation and belonging.

Communication Ease Scale. One way of assessing how successfully an inclusive environment promotes equal access to instruction is to compare the perceptions of deaf and hearing students about their ease or difficulty in communicating. For this study, a modified version of the CCES was used, in which communication ease is

conceptualized as having two dimensions: a cognitive dimension and an affective one. The CCES (Garrison, Long, & Stinson, 1993), uses a six-alternative Likert scale to examine each dimension. The cognitive dimension is concerned with self-perceptions about the amount and quality of information that students receive and send. The affective dimension asks students to rate how they feel when communicating with hearing and deaf peers, teachers, and support staff. Both positive (feeling good, relaxed, comfortable, confident) and negative (frustrated, nervous, upset) affective responses are explored, and students responded to a total of 110 items. Additionally, students were asked two open-ended questions regarding their best and worst classroom communication experiences.

Deaf and hearing business ($n = 24$), computer science ($n = 4$), and information technology ($n = 48$) majors were paid \$10 each to fill out the AEF and CCES. Hearing students were matched by gender, course, and major with the deaf students. Materials were placed in student departmental mail folders and students were informed about the study and reminded via electronic mail to return the questionnaires. Seventy-six students (46 deaf and 30 hearing) responded to the questionnaires. The average student was 23 years old; 26 were female and 50 were male.

Instructor interviews. Interviews are a conventional qualitative research technique used to explore in detail with research participants their experiences, beliefs, and perspectives regarding a particular idea, practice, circumstance, or event (Spradley, 1979). By asking individuals general questions and encouraging them to elaborate on their ideas through personal stories and examples, data are collected that can then be analyzed for code categories, that is, groupings of types of responses similar in nature. This approach often yields information inaccessible through traditional quantitative collection strategies.

A target number of 15–20 instructor interviews was established by the project team as sufficient to describe the range of experiences and perspectives of this group. A list of 31 potential instructors to be contacted for interviews was then developed by NTID faculty who provide tutoring for students enrolled in supported courses. In developing instructor lists, consideration

was given to the diversity of the group. Instructors new to RIT were included as well as those who had worked at RIT for many years. Instructors were selected who had different teaching styles and course structures (e.g., lecture versus discussion). Male and female instructors were included in each of the programs offered through Computer Science, Information Technology, and Business (including Management, Finance, Information Systems, and Marketing). This list was then organized so that, by working from the top of the list down, within programs, we would get the most diverse group possible.

Instructors were contacted via e-mail or telephone by one of the three researchers conducting the interviews. The project was explained, and instructors were invited to participate in an informal, semi-structured interview. The 17 interviews completed represent those who agreed to participate; approximately two-thirds were from the top half of names listed within their program. Interviews were conducted with instructors teaching courses in Computer Science (4 of 6), Information Technology (5/9), Management (1/3), Finance (3/6), Information Systems (2/3), and Marketing (1/2). The range of years teaching at RIT for the interview group was from 2 to 23 years, with an average of 12 years. Of the 17, 11 are male (from a total of 20 on the list) and 6 are female (from a total of 10).

Interviews lasted approximately 1 hour. Core topics covered in the interviews include instructors' perceptions of (1) deaf students enrolled in their classes, (2) barriers to access within their classes, and (3) strategies they use to facilitate access to their course materials. With the instructor's permission, interviews were recorded on audiotape.

Results

Quantitative Results

The first set of analyses focused on comparing the deaf and hearing responses to the Academic Engagement Form and its four open-ended questions. Deaf and hearing respondents were then compared on the Classroom Communication Ease Scale and its two open-ended questions.

The AEF was found to be highly reliable for both hearing (Cronbach's $\alpha = .96$) and deaf respondents ($\alpha = .92$). Deaf students reported being just as actively engaged in learning (mean = 4.08) as hearing (mean = 4.18) students when responses to the entire scale were analyzed. Responses to subscales indicated that hearing students felt more like they belonged at RIT and were more a part of the RIT family than did deaf students. Items such as ("I feel like I belong at RIT," "The people at RIT are like a family," and "I'm proud to be an RIT student") were somewhat more frequently endorsed by hearing students than by deaf students, $t(73) = 1.88, p = .06$.

Hearing and deaf students also differed on their perception of the appropriateness of the teachers' pace when presenting information. Deaf students less frequently, $t(74) = 4.21, p < .01$, perceived the teachers' pace (e.g., "My teacher makes sure I understand before he/she goes on," "My teacher makes sure that he/she doesn't teach faster than I can learn") as optimal for learning than did hearing students.

As part of the AEF, students were asked to supply their own words to the following incomplete sentence: "I feel like I am part of the classroom when I _____." Both groups reported that participation was the most frequent reason for feeling a part of the class. This sentiment was expressed by 66% of the hearing and 44% of the deaf students. Their comments are best captured by a deaf student who said, "participate and learn by doing" and a hearing student who said, "am encouraged to participate and allowed to figure things out for myself." Thirty percent of hearing students and 33% of the deaf students mentioned that they feel part of the class when they understand the material. Based on the comments of both groups, understanding the material allowed them greater participation, which was the key element to feeling part of the class.

What do students do when they have difficulty learning? Students responded to this statement: "When I get stuck, I _____." in their own words. Twenty-two percent of hearing students and 24% of deaf students said they use friends or classmates to help them when they get stuck. More deaf students (31%) mentioned going to the teacher for help than did hearing students (22%). Deaf and hearing students differed

with regard to their use of tutors and trying to “figure it out myself.” Deaf students were less likely (15%) to try and resolve it themselves and were more likely to look to tutors for support (29%) than were hearing students (30% and 4%, respectively). This finding may be influenced by the support system available to deaf students at RIT. Deaf students in the majors under study have full-time faculty tutors available to provide assistance, whereas this support is not provided for hearing students. The availability of tutors and notetakers may also contribute to deaf students being less likely than their hearing peers to try and resolve learning problems independently.

Cronbach’s alpha analyses indicated that agreement on the CCES was also highly reliable for hearing ($\alpha = .95$) and deaf ($\alpha = .94$) respondents. When overall ease of communication was examined, we were surprised to find no statistically significant differences between responses for the two groups, given the potential for communication difficulties when language interpretation occurs. That is, the deaf students (mean = 3.95) perceived the ease of communication with teachers and peers similar to their hearing peers (mean = 4.01). Deaf students’ feelings about communication, both negative (nervous, frustrated, upset) and positive (relaxed, comfortable), were also very similar to their hearing peers’. This finding is important given the complexity and barriers to communication that exist for deaf students in mainstream settings. The success of interpreters and notetakers in providing equal access to communication for deaf learners in mainstream classes is highlighted by this finding.

Students were asked to respond to two open-ended sentences about communication using their own words. “Communication in the classroom is best for me when _____” and “Communication in the classroom is worst for me when _____.” Deaf students’ responses tended to focus on the role of the interpreter as a mediator of the quality of the communication. Sixty percent of the deaf students mentioned the interpreter when discussing the best communication. The student who said that the “interpreter is being effective with signing skills and understand the concepts in class” is representative of most responses. The complexity of being “effective with signing skill” is clear,

insofar as some students refer specifically to the importance of ASL skills while other students mention how important it is for him or her to read lips or have an oral interpreter.

Hearing students’ comments about the best classroom communication focused on the teacher being clear, easy to understand, and organized; the pace was not too fast; and the teacher involved students. One hearing student summarized the optimal communication environment as one in which “the classes are small to medium sized, [and] the teacher is interested in listening to the students (usually younger teachers).” Two hearing students indicated that having an interpreter in the classroom helped their comprehension because when “deaf students and an interpreter are present . . . the teacher moves slower in presenting the material which allows me to understand more.” Both groups indicated that the instructor’s pace influenced ease of classroom communication.

The interpreter was mentioned by 48% of the deaf students in their discussions of when communication in the classroom is worst for them. Not having an interpreter, or not being able to see the interpreter, was mentioned by a number of students: “There is no interpreter and I feel frustrated about participation.” When the interpreter is present, the student may need a specific skill level and sign system that is not being accommodated: “The interpreters try to sign ASL and don’t understand the content then sign most in English” or “The interpreter does not understand what I am saying, making me to repeat and forget what I wanted to say.” Others pointed to the importance of the interpreter understanding the class material: “Interpreter couldn’t perform his/her duty if he/she cannot understand the concepts of class.” Thus, the central role of the communication facilitator is reflected in both the positive and negative communication experiences of deaf postsecondary learners.

Hearing students’ difficulties with classroom communication focused on the pace of the teacher, distractions from other students, and teachers using “straight lecturing” as the primary form of information delivery. Again, the positive influence of deaf students in slowing down instruction was noted. One hearing student commented on how things are difficult for him when

deaf students are not in class. As he put it, “[when] there are not deaf students and the teacher is presenting material too quickly for me to understand, forcing me to exclude myself from class discussions and questions.”

Qualitative Results

The quantitative data described before focuses on student perceptions of the teaching and learning experience. However, this is only one piece of the puzzle. Another important piece involves instructors’ perceptions of what it is like to work with deaf students. How do instructors feel about teaching deaf students? Do they see differences in the performance or behavior of deaf students? What do they feel are the major barriers to access and participation for deaf students in their classes? Do they do anything differently or special to accommodate the needs of deaf learners? These and other questions were raised through qualitative interviews with 17 instructors who have had deaf students in their classes. Semi-structured interviews were used because this approach is more likely to yield the level of detail and “real-life examples” that we felt were crucial to understanding instructors’ perspectives. Tape-recorded interviews were transcribed verbatim and the transcripts coded for recurring patterns and themes (Bogdan & Biklen, 1992). In this section, major topics are reviewed, drawing on the interviews for illustrations.

Who is responsible for access and accommodation? Instructors’ comments suggest that there is diversity of opinion regarding the answer to this question. Their responses range from the perspective that the student and NTID are responsible for access and learning, to a perspective in which teachers see themselves as having primary responsibility for the success of deaf students. At a midpoint on this continuum is the notion of shared responsibility, in which instructors, students, support personnel (NTID), and college personnel (mainstream college) share responsibility for ensuring that instruction and learning are accessible for deaf students. Most comments fall somewhere between shared responsibility and the belief that NTID and the deaf students are primarily responsible. The degree to

which instructors are willing to modify their classes, instructional materials, and evaluation procedures is an outgrowth of their perspectives about responsibility. The continuum in Figure 1 summarizes the range of both responsibility and instructor-generated modifications.

Comments that suggest that instructors have little or no responsibility to facilitate the inclusion of deaf students within their class and that learning is solely the responsibility of the student, hearing or deaf, with or without support services, were often framed in terms of “doing nothing different,” and “it is the student’s responsibility to learn.” Instructional styles are not modified, nor is special attention given to deaf students or to hearing students who may have specific learning preferences or needs. The basic approach of these teachers is that they do not believe their instruction needs to be modified to fit the needs of any student. Deaf students are simply an extension of this approach, amplified by the level of resources provided by NTID and the large number of deaf students on the RIT campus. Implicit in this perspective is the notion that NTID has “leveled the playing field” by providing interpreters, notetakers, and tutors, and that instructors therefore can, and in fact should, proceed as usual. As one instructor put it, having deaf students in class is “transparent”; he further explains that this is a computing term meaning “that you are unaware that there is anything different.” If support services are not provided or fail to accommodate the teacher’s preferred approach, the responsibility for change rests with the support team and NTID. The following example illustrates this viewpoint:

Instructor: The only issues that ever arise tend to be technical, like scheduling an interpreter . . . I run . . . 2-hour classes . . . and I don’t take a break. And I am not going to take a break, and this can create difficulties with interpreters. And I have told the support team, “Look, if interpreters can only work for an hour for very logical and defensible reasons, I have no problem with that. Just send another one in at the end of one hour. . . .” And you know, they have to explain to me, “Well, the way we schedule them they need time to get from A to B.” And so sometimes there has been a break in

deaf students and possible accommodations span the gamut from one person with many years of classroom experience teaching deaf students prior to coming to RIT, to another who had no experience at all and was not even informed that he would be teaching deaf students. As he put it, "The first day I was here, I walked into a class with deaf students and an interpreter. I had never worked with one before, no one told me this was going to happen. . . . [F]or five minutes, [I thought] this is the strangest thing in the world! How am I going to do this? And, you know, then I watched the interpreter do her thing and it seemed OK and that was the end of it. . . . I said, 'Who are you?' She was standing up on the stage right next to me and I said, 'What are you doing here?'"

Most instructors, however, were neither as experienced nor as taken by surprise. They learned about deaf students from a variety of sources, often in a serendipitous fashion. Interpreters were often cited as important sources of information, likely because they are in the class with the students and instructors. Often, instructors said they ask interpreters for feedback on their teaching and invite them to tell them when they are speaking too quickly or need a concept repeated. Others said they go to support faculty when they need information. Trial and error is yet another learning strategy, as are informal conversations with departmental colleagues. Physical proximity often dictates who will be tapped for assistance and ideas. In one case, support faculty are housed in the same building as the instructors and often are queried when passed in the hall. Another department is adjacent to the interpreter support group, facilitating questions and communication support on an informal and "on the spot" basis.

Training and professional development Instructors were asked whether they would be interested in training and professional development regarding accommodation of deaf students within their classes. While many said they would be interested in having more information or ideas, most were not enthusiastic about investing much time or energy in these kinds of activities. For many, time was the biggest barrier to participation, particularly in combination with the perceived lack of benefit of this training. This low "cost-benefit" factor made

many reluctant to participate in training efforts. Generally, their explanations for low interest levels were tied to the earlier assignment of responsibility to NTID for accommodation, or to the perception that participation would yield few benefits. Several instructors noted that deaf students are just a small percentage of their classes. Also, they may have deaf students only one out of three quarters or not at all. They find it difficult to justify taking time to improve instructional strategies for such a small group, particularly when their annual appraisals and increments are often tied to student evaluations (dominated by hearing students). As one person said:

I don't think there would be a lot of incentive on my part at this point [to attend workshops about teaching deaf students] because the number of students is so small. I am worrying about the course evaluation scores of the 95% of the other students and some of the things that I do for the other students to improve the course for them will carry over to the hearing-impaired anyway. But to think up special strategies for that 5% of . . . hearing impaired that would just affect them, it is not worth it.

As this instructor cited notes, the most attractive instructional strategies benefit both deaf and hearing students. For most instructors in mainstream classes, deaf students are simply not even a minor consideration. One instructor made the following observation regarding the potential interest in the department for a workshop on teaching deaf students:

[Having deaf students in class] is a nominal part [of what we do]. It is immaterial. They [colleagues] have only a couple [of deaf students]. They have an interpreter. They have notetakers. And they would get by in their office writing if there is not an interpreter present. And you know, in the meantime their focus is really on very different things. . . . [I]t would be very difficult in the context of the competition for their time and energy for them to view that [workshop] as very important. And I am not saying that because they view deafness as an unimportant social or professional issue. It is just that

there are not enough deaf students to justify that type of effort.

Central to this person's comments is the idea that instructors are busy and have many demands on their time. Research, publishing, curriculum development, and satisfying the instructional needs of the majority of their students take a priority in their schedules. Any efforts to provide information specifically focusing on deaf students must take this perspective into consideration.

Beyond the obvious: barriers to access for deaf students in mainstream college classes. In describing their instructional experiences, instructors were asked to discuss elements of successful instruction with all students and then to compare the impact of these practices on the deaf students in their classes. Analysis of their comments reveals several subtle barriers to access for deaf students in mainstream instructional settings.

The physical set-up of many classrooms creates barriers for deaf students by reducing the degree of direct contact between student and instructor. For example, when instructors were asked how they know whether students in their classes are "getting it," they generally spoke about watching the students for visual cues, including eye contact and body language. They readily admitted that this is less possible with deaf students, who often sit to the side of the room and focus on the interpreter. In a similar vein, an instructor said that he often steps down from the elevated stage and walks along the aisles when lecturing; however, he almost always walks along the aisle furthest from the deaf students, since he does not want to walk between these students and the interpreter.

Some teaching strategies and instructional styles make classroom learning more difficult for deaf students, even with interpreters and notetakers. For example, when instructors are writing a computation on the board and talking at the same time, students must choose whether to capture the comments by watching the interpreter or follow the computation by watching the board. Similarly, in many computer courses instructors project a computer screen and perform manipulations on this screen while describing or ex-

plaining their actions; again, deaf students must choose which half of the message they want to receive. While several instructors acknowledged that this is a problem, none was able to offer concrete ideas for improving access to this type of instruction.

Participation of deaf students is sometimes limited by differences in the ways that instructors respond to potentially disruptive behaviors in the class. The most frequently discussed example involves students' talking during lectures. Hearing students talk orally, or "with voice," while deaf students sign among themselves. Instructors said they ask hearing students to stop talking during lectures but often ignore the signed conversations of deaf students. When asked to explain this decision, they said that they speak to the hearing students because they find the spoken conversation personally distracting, or they feel it is distracting for other hearing students. Signed conversations, on the other hand, are not disruptive to the hearing students or to the instructor and are thus more often tolerated. Instructors sometimes added that they are reluctant to interrupt deaf students because they are unsure of what they are discussing. For example, they wonder if students are talking about the class material, which seems a legitimate reason for them to be talking. When asked if they would tolerate conversations about coursework among hearing students during class, they said that they would ask these students to share their question with the class so everyone could benefit but added that this is only possible because they could discern the nature of the conversation before deciding whether to intervene. By not asking the deaf students to share their conversations, they are indirectly limiting the participation of these students and perhaps contributing to the perception of deaf students that they do not "belong" at RIT as much as hearing students.

Discussion

Two themes emerge as important across both quantitative and qualitative findings. First, the perceptions of deaf students with regard to educational environments are generally not significantly different from those of hearing students. Both express similar levels of classroom engagement and communication ease. Both de-

fine participation and understanding of course material as central to their feeling a part of the class. Both indicate that instructors' pace influences their ease of communication in class settings. Their differences are more related to the specific vehicles through which they interact within their classes. For example, while overall communication ease is similar for both groups, deaf students emphasize the role of the interpreter in effective communication of information, while hearing students focus on the role of instructors. Similarly, while both agree that participation is important for feeling a part of the class, deaf students express this sentiment less frequently than hearing students, a result probably influenced by the constraints imposed by indirect communications with instructors and hearing students.

Second, the continuum of responsibility for classroom learning on which faculty vary affects both deaf and hearing students. At the one end are teachers who assume it is their responsibility to share information in a way that helps all students learn, regardless of hearing status. These teachers do not assume that there is something wrong with students who do not understand information. Instead, they assume there is something wrong with the interface between the teacher and the student, or perhaps with their own presentation. These teachers do not differentiate between their responsibility for hearing and deaf students. They want all their students to "get it." At the other end of the continuum are teachers who assume that it is nearly all the students' responsibility to understand information as it is given to them. These teachers do not differentiate between their treatment of deaf and hearing students as much as they emphasize that all students must learn for themselves and that the teacher is not responsible if someone does not "get it." These teachers do not focus on the teacher/student interface; they do not conceptualize an interface. While the special needs of deaf students push both ends of the continuum to extremes, there are nonetheless points along the same continuum that apply to all students and instructors.

Further study of this continuum and the kinds of interactions it represents between teachers and students yields implications for practice. For example, some hearing students commented that the slower pace of instruction used when deaf students are present is

beneficial to them. Several instructors indicated that, while they tend not to make adaptations specifically for deaf students, they would do things to improve their overall teaching effectiveness if it enhanced their student ratings. It is therefore important to identify teaching practices that both meet deaf students' needs and are beneficial to all students.

The continuum also holds implications for student roles and responsibilities. While it is beyond the scope of this study, we have observed students (both deaf and hearing) who remain completely passive even when the instructors' pace is too fast to be understood or when course materials are confusing. We recommend further research that explores more fully the behaviors of students along this continuum, as well as strategies that students can employ to increase their access to learning.

What specific recommendations for practice emerge from this study? First, emphasis should be given to the similarities between deaf and hearing students and those instructional practices that enhance learning for everyone.

Second, instructors should be selected for interventions who are interested and willing to modify their teaching strategies to facilitate inclusion of all students. Furthermore, they should have sufficient and continuous exposure to deaf students in their classes. These instructors can then encourage and model good practices for their colleagues.

Third, intervention strategies should be practical and reasonably easy to implement. For example, it is not helpful to suggest that instructors "be more sensitive to deaf learners." More practical suggestions might include (1) seating interpreters near the lectern in order to decrease the visual distance between the instructor and the interpreter, (2) providing handouts of notes that will be displayed on the board during class, or (3) pausing and counting to five after asking a question to facilitate inclusion of deaf students, as well as hearing students who may need an additional few seconds to process information.

Fourth, strategies should be disseminated through user-friendly vehicles. For example, a web page that can be accessed at any time with a list of options (strategies, personal stories of frustrations and successes, and a chat room) may be preferable to traditional work-

shops that often disrupt busy schedules and require travel to central locations on campus.

Fifth, excellence in teaching should be rewarded. The power of professional recognition, merit increments, and positive appraisals cannot be underestimated in changing the behaviors of instructors.

In conclusion, mainstream postsecondary educational settings pose special challenges for deaf students. Interventions must be designed that are specific, involve changes in the behaviors of both students and instructors, and target and reward best practices and educational models. Additionally, the extended benefits of improved access to instruction for deaf students to all students must be emphasized. Efforts to focus attention only on deaf students is almost certain to meet with defeat due to the relatively small numbers of these students and the overall reluctance of college faculty to modify their practices for a single target group.

Note

1. The use of the notation “. . .” indicates that text from the interview is omitted. This is a space saving convention, generally used when there is repetition or extraneous material in the comment. A word or phrase inserted into the text by the researcher is set off with brackets. This is generally used for clarification.

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