

Teaching Strategies in Inclusive Classrooms With Deaf Students

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The purpose of this study was to investigate teacher speech and educational philosophies in inclusive classrooms with deaf and hearing students. Data were collected from language transcripts, classroom observations, and teacher interviews. Total speech output, Mean Length Utterance, proportion of questions to statements, and proportion of open to closed questions were calculated for each teacher. Teachers directed fewer utterances, on average, to deaf than to hearing students but showed different language patterns on the remaining measures. Inclusive philosophies focused on an individualized approach to teaching, attention to deaf culture, advocacy, smaller class sizes, and an openness to diversity in the classroom. The interpreters' role in the classroom included translating teacher speech, voicing student sign language, mediating communication between deaf students and their peers, and monitoring overall classroom behavior.

Education models used to serve deaf students have evolved gradually over the last century.¹ Early efforts included private schools, some with instruction in sign language. More recent models have focused on special units within public schools or mainstreaming into general education classrooms with limited special services

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(Moore, 1996). The last few years have seen the advent of yet a new model, the “inclusive” classroom. Instead of providing separate services for students with special needs, inclusion integrates all students and services into the life of the general education classroom (American Speech-Language-Hearing Association [ASHA], 1996; Bunch, 1994; Giangreco, Baumgart, & Doyle, 1985). Although the goals of inclusion are relatively consistent across schools, districts approach inclusion differently according to the needs of their students and the available resources (Evans, Townsend, Duchnowski, & Hocutt, 1996; Phillips, Saponas, & Lubin, 1995; Zigmond, 1995).

Available data on the success of inclusion with younger deaf students are limited. Communication needs of deaf students and the teaching practices in a typical oral-only classroom are potential difficulties with inclusive education. Sign language interpreters can be used to supplement teacher speech and facilitate deaf student participation in classroom discourse. In light of this sign language supplement, the purpose of this study was to investigate the inclusive classroom environment in three areas: teacher speech to deaf and hearing students, inclusive philosophies and teaching strategies, and the role of an interpreter in classroom communication.

Language Characteristics of Deaf Students

Early studies of children with hearing loss focused on obtaining inventories of their expressive language

(Geers & Moog, 1978). Children with hearing impairments often show significant delays in phoneme production, vocabulary, and syntax (Schirmer, 1985; Seewald, Ross, Giolas, & Yonovitz, 1985; Skarakis & Prutting, 1977). It is assumed deaf students can improve their language through adequate exposure and practice; however, Nelson, Loncke, and Camarata (1993) emphasize that poor input at an early age and severe delay require intensive interventions that focus on enhancing strategies for all components of language.

Although delayed in other areas of language, deaf students often have communicative skills (such as making a comment, request, or acknowledgment, etc.) that match those of their hearing peers (Curtiss, Prutting, & Lowell, 1979; Nicholas, Geers, & Kozak, 1994). Deaf students rely more on nonverbal labeling techniques than would be expected in children with normal hearing, but still express a full range of communicative skills (Curtiss et al., 1979; Nicholas et al., 1994). These skills are the foundation on which spoken language is later developed (Skarakis & Prutting, 1977). Providing nonverbal modes of communication in the classroom may therefore be an important starting place for students developing their verbal language skills (Nicholas et al., 1994).

Communication in the Classroom

Language delays generally lead to poor academic success and difficulties in classroom communication (Musselman, Lindsey, & Wilson, 1988). Savage, Savage, Evans, and Potter (1986) found that deaf students regularly enter school with a 3-year delay in language skills; moreover, their rates of performance improvement are mediocre at best, with the average high school-age deaf student reading at a third-grade level. Savage et al. hypothesize that these academic problems are primarily a result of poor communication between the deaf students and the teacher. Savage et al. reviewed research on three types of communication commonly used in classrooms: oral-only (lipreading), mainly-oral (lipreading and finger spelling), and simultaneous communication (lipreading, finger spelling, and signing). Savage et al. summarize children's rates of reception and comprehension of materials using

these three different methods. These overall scores do not reflect variation in subscores at the single word, sentence, or syntax levels. The authors describe the differences as illustrating how the change in communication method has affected rates of information reception by deaf children. Overall, the oral-only approach resulted in the lowest level of comprehension by deaf students (46% of all utterances). The mainly-oral method of lipreading and finger spelling showed significantly higher rates of comprehension (65% of the language input). Although an improvement, deaf students exposed to speech and supplementary finger spelling still were not benefiting from an enriched language environment. Savage et al. found that sign language helped dramatically: comprehension increased to over 86% using the simultaneous communication method.

It appears important, therefore, to augment teacher speech with sign language. The findings of Savage et al. (1986) are further supported by Hyde and Power (1992), who found simultaneous communication beneficial for both severely and profoundly deaf individuals on a receptive language comprehension task. For participants with profound hearing loss, conditions using combinations of lipreading, audition, and finger spelling were all inferior to conditions involving signing. For those with severe hearing loss, however, the superiority of conditions with signs was less clear. Even so, results from conditions of audition alone were poorer than those with speech and finger spelling or signs combined. The results of this study demonstrate that communication needs of deaf students may vary by level of hearing loss yet at the same time confirm previous findings that simultaneous communication may be better than oral-only delivery.

Results from Savage et al. (1986) and Hyde and Power (1992) suggest that it is possible to have an effective simultaneous communication environment with a single instructor. Power, Hyde, and Leigh (1996) further tested this hypothesis by asking six teachers to tell a short story to three simulated groups of early elementary school students. That is, the teachers were asked to pretend they were telling the story to hearing students, deaf students using oral-only methods, and deaf students who used simultaneous communication. Power et al. measured linguistic complexity with both

Minimal Terminable Units (T-units)² and Type Token Ratio (TTR) units of analysis. Overall, they found no significant differences in T-units for the oral/hearing group, the oral/deaf group and the simultaneous-communication/deaf group. However, in the analysis of TTR, the simultaneous-communication/deaf group simulation scored significantly higher than both of the other groups.

A study by Huntington and Watton (1986) suggests that we should be cautious about the use of simultaneous communication in classrooms with deaf students. This study illustrates the difficulty one person has in providing complex spoken language and manual language input. They investigated teacher speech in oral-only, mainly-oral (with finger spelling), and simultaneous communication classrooms. Teacher speech was analyzed for mean length of sentence (MLS), proportion of simple to complex sentences, total word output, range of vocabulary, sentence type (declarative, question, and imperative), and closed versus open questions. The results showed that teacher speech in the oral-only settings was highest on all complexity measures. In contrast, teacher speech in the simultaneous communication models consistently ranked below that of the oral-only and mainly-oral classrooms. It appeared that the demand of two languages, spoken and signed, reduced the teacher's oral output and linguistic complexity (see also Wilbur & Peterson, 1998).

Although student comprehension may improve when the teacher uses simultaneous communication, one language source may come at the expense of richer, more complex spoken language. Content of sign language may also be limited due to demands of producing both languages simultaneously. Inclusive classrooms with an interpreter may be less susceptible to language constriction because sign and speech come from separate language sources. No study has addressed the oral and signed language environment of such an inclusive classroom. There is a need, therefore, to see what oral language patterns occur when both a general education teacher and an interpreter are present.

Inclusive Practices

One of the greatest challenges in an inclusive classroom is managing students with a wider range of abilities

than found in a traditional general education setting. Mixed social and academic outcomes have been found for students with a range of disabilities (Baker & Zigmond, 1995; Evans et al., 1996; Giangreco et al., 1995; Phillips et al., 1995). Most studies are case histories, tracking successes and challenges within a single inclusive classroom. A consistent theme that emerges from these studies is that successful inclusive classrooms focus on the needs of individual students.

The above outcomes are for students with disabilities in general; a recent issue of the *Journal of Deaf Studies and Deaf Education* (*JDSDE*, 4[3], 1999) was dedicated to research on inclusion with deaf students. In these preliminary articles, authors explored broad themes they found in inclusive classrooms and made recommendations for improvements and future research (Antia, 1999; Antia & Stinson, 1999; Gaustad, 1999; Jiménez-Sánchez & Antia, 1999; Stinson & Antia, 1999; Stinson & Liu, 1999). Overall, communication arose as the predominant theme.

Although perhaps limited by its large scope, a focus on communication provides a platform from which to build inclusive teaching practices with deaf students. Communication is likely the most salient area in which individualized education applies to deaf students. We know that they typically have poor language skills and that clear communication is important for comprehension. In response to these needs, we can speculate that teachers may try to add finger spelling to their speech, place deaf students near the front of the room, give them language level-appropriate assignments, or discuss deafness as a culture. Other changes may be subtler, such as using simplified or exaggerated speech. Research on specific communication strategies and how teachers create an individualized education environment is needed to make these recommendations more concrete and usable for a classroom teacher.

An important element in creating a communicative environment in an inclusive classroom is the sign language interpreter.³ A sign language interpreter is a unique addition to the inclusive classroom model for serving deaf students. As with a special education teacher, an interpreter participates in the life of the classroom. The interpreter's language expertise may prove valuable in making accommodations to curriculum and assessment for deaf students. The interpreter's

primary service, however, is more specific: to provide sign language translation of teacher speech to the deaf students. The extent of this role in an inclusive classroom is an important area of study, particularly his or her specific language expertise and potential role as a member of the inclusive teaching team.

Purpose of This Study

The purpose of this study was to investigate teaching practices in inclusive classrooms with deaf students. Its primary aim was to determine if oral language differs when directed to deaf or hearing students. Extending Huntington and Watton's (1986) analysis of overall language use in simultaneous communication classrooms, this study looked specifically at teacher speech to individual deaf and hearing students. Do general education teachers adjust their speech directed toward deaf students, using less complex language than toward hearing students? Analyses of teacher speech from transcripts of audiotaped observation periods were made to address this question. A second goal of this study was to provide descriptive data on inclusive philosophies held by the general education teachers in these classrooms. How do teachers address issues of individualized education and communication? These philosophies and strategies were identified through classroom observations and teacher interviews. The last goal of this study was to investigate how the interpreters were integrated into interaction between deaf students, their teachers, and their hearing peers. The interpreters' roles in classroom communication were investigated through classroom observations and teacher interviews.

Method

Participants

Two classrooms of students and teachers in an urban public school participated in this study. The school site contains the full-time deaf and hard-of-hearing program for the district. The first classroom was a combination kindergarten/first-grade (K/1) room and had 16 students, 7 deaf and 9 hearing. The second classroom was a combination second-/third-grade (2/3) room with 2 deaf students and 12 hearing students.

The K/1 room had an unusually large number of deaf students; such a classroom does not reflect a typical inclusive classroom composition but can happen when there is a large cohort of deaf students, or when parents from other districts are attracted to programs that have experience teaching the deaf. These classrooms also have significant resources and a history of serving the deaf, a circumstance not found in many other inclusive settings. Yet the composition of these classrooms, although not characteristic of those inclusive classrooms that have only one deaf student, still maintains a predominantly hearing population.

The ages of the deaf students ranged from five to seven years in the K/1 room and from seven to nine in the 2/3 room. All deaf students had severe to profound losses in one or both ears, and all wore FM hearing aids. Of the nine deaf students, three were of non-European descent and one did not have exposure to English in the home. One deaf student in each room had additional physical disabilities: a kindergartner with severe psoriasis and a second grader with neuromuscular disability.

Both classrooms had one full-time general education teacher and one full-time interpreter during the observations. Both interpreters had spent over 20 years translating in educational settings. Additional school staff included two teachers certified in deaf education who worked with the deaf students at times other than the observation periods and who were not in the classrooms on a full-time basis. Brief biographies of the general education teachers were obtained in the initial site visit through discussions about past experiences teaching deaf students. The K/1 teacher had taught the deaf for 20 years and grew up with two parents and a sibling with hearing loss. She was fluent in sign language. The 2/3 teacher had deaf students in her classroom for 3 years and is perhaps more typical of many inclusive teachers. She had taken some courses in sign language and had a growing sign vocabulary but limited exposure to people with hearing loss.

Parents of the deaf students received consent forms asking permission to observe their children, audiotape classroom activity, and gather information from student records. Parents of the hearing students received an information letter stating the dates and purpose of the observations. Teachers and interpreters were each

given a consent form after an initial discussion of the study and its purpose.

Observation Period

Each observation period was scheduled so that it occurred when all students were participating in the classroom activity. The interpreters and the teachers were present for the entire period during each observation. In the K/1 classroom, the observation periods occurred during the first session in the morning. The teacher and the interpreter sat in front of a carpeted area and the students in a group on the floor. The teacher went through a series of topics, such as the day of the week, the date of the month, how many days they had been in school, who was having lunch, and special theme of the day (Groundhog Day, Valentine's Day, etc.). In the 2/3 classroom, observations occurred during the social studies lesson. The students sat in desks (in two rows) in a semicircle and the teacher and interpreter sat in chairs or stood in the front of the room. The class began each lesson with a brief introduction to the task for the day, a discussion of the topic, and some individual project work mediated by the teacher. Although the task varied each observation day, all tasks were thematically related to a long-term "habitat" project that lasted throughout the course of the study.

Before the first observation period in each class, I visited the classrooms and introduced myself to the students. I explained that I would be in the back of the room taking notes on teacher behavior. Four observations of varying lengths (30–60 minutes) were made in each classroom over a 2-month period. I sat to the side with an audiotape recorder and clipboard with a view of both the staff and the students. For each utterance, I noted the targeted audience, key words, subject matter, and any relevant action. I took notes on whether teacher speech was addressed to the whole group or an individual student (specified deaf or hearing). Utterances in which the target audience was unclear were coded by default as a "group" utterance. The process was relatively simple because teachers made it clear to whom they were speaking by calling on a student by name or standing near the student. I was able to make similar shorthand notes on many of the student initiations to provide greater context for teacher speech,

making it easier to determine to whom the teacher responded. I also noted when the interpreter would speak for a deaf student when he or she signed. Limitations to this method include a lack of reliability on whom the teacher was addressing (particularly when student was not identified by name) and whom the interpreter was voicing if a child was using sign language. The quality and completeness of the sign translation were not recorded during these observations.

Transcripts

A trained transcriber at the campus disability resource center made transcripts of the teacher speech from audiotapes. Accuracy of the transcripts was verified with observation content notes by the researcher and by an assistant. The original transcription did not involve segmentation into individual utterances. All sequential talk by a single speaker was initially transcribed as a single unit. In order to make the transcripts suitable for analysis, the researcher separated each turn into single utterances using the content notes from the observations. An utterance typically consisted of one sentence or meaningful phrase. Reliability for utterance breakdown between the researcher and a blind assistant was 99%.

Transcripts were then analyzed using the Systematic Analysis for Language Transcripts, or SALT, (Miller & Chapman, 1998) computer software package. Measures of teacher complexity mirrored many of those taken in Huntington and Watton (1986). This study analyzed (1) number of utterances; (2) Mean Length Utterance (MLU); (3) proportion of questions to statements; and (4) proportion of open to closed questions. Each of these measures was analyzed for speech addressed to deaf students, hearing students, and the classroom as a whole. All analyses were done only on complete and intelligible utterances, or those that did not have inaudible words or false starts. Complete and intelligible utterances totaled 97% for the K/1 teacher and 81% for the 2/3 teacher.

SALT first tallied the number of utterances per speaker and the MLU in words for each utterance. The proportion of questions to statements was then tallied based on utterance punctuation. Utterances were coded as questions when there was a question mark and

statements for all other punctuation. Questions were coded as open or closed based on criteria similar to those used in Huntington and Watton (1986). They categorized questions by two types: closed and open. Closed questions are forced-choice questions; most commonly these require only a “yes” or “no” response, or a choice among two or more options provided by the teacher. In contrast, open questions require students to generate, elaborate, and explain their responses. Open questions can include those that begin with *what*, *when*, *where*, *why*, and *how*, as well as *can you tell me about*, and so on. For example, “Did you go to school yesterday?” was coded as a closed question and “Where do you think the groundhog went?” was coded as an open question. Reliability for question coding between the researcher and a blind assistant was 95%.

Interviews

Each teacher was interviewed separately by the researcher after the observations were completed. The 2/3 interpreter also participated in the interview with the 2/3 teacher. Interviews were audiotaped with teacher permission and transcribed at the campus disability resource center. Teachers were asked about their experiences in an inclusive classroom, their students’ individual needs, strategies for working with the interpreter, and challenges of having an interpreter and deaf students in their classrooms. A list of the questions asked is provided in the Appendix.

Discussion

Each research question as stated in the Purpose section is addressed in turn, the measures of teacher speech discussed first, followed by the results from teacher interviews and classroom observations.

Teacher Speech

Tables 1 and 2 display all data of teacher speech for the K/1 and 2/3 teachers, respectively. Data collected via classroom observations and transcripts were scored according to whether speech was directed to deaf or hearing children, but events were not tallied separately for

Table 1 Number and complexity of teacher utterances for kindergarten/first-grade teacher

Variable	Deaf students	Hearing students
Total utterances	103	226
Mean no. of utterances per student	14.3	24.7
Mean length utterance	6.69	5.85
Frequency of questions	28	64
% of question use	27%	28%
Frequency of open questions	7	37
% of open question use	25%	27%

Table 2 Number and complexity of teacher utterances for second-/third-grade teacher

Variable	Deaf students	Hearing students
Total utterances	9	179
Mean no. of utterances per student	4.5	9.8
Mean length utterance	4.22	7.11
Frequency of questions	4	68
% of question use	44%	61%
Frequency of open questions	7	17
% of open question use	75%	54%

each child. As a result, statistical analyses could not be performed on the data. There were, however, consistent patterns worthy of consideration, particularly as they coincide with expectations concerning the speech that teachers addressed to deaf and hearing children. Variables measured include the frequency of utterances to individual deaf and hearing students, MLU, the frequency and percentage of utterances that were questions, and the percentage of questions that were open questions.

Frequency. The first line in Tables 1 and 2 presents the total number of utterances to hearing and deaf students for all transcribed observations (about 6 hours total). In the K/1 classroom, deaf students received a total of 103 utterances, or a mean of 14.3 utterances per student. Hearing students in the same room received a total of 226 utterances, for an average of 24.7 per student. Speech directed toward deaf students in the 2/3 classroom totaled 9 utterances, for an average of 4.5 utterances per student. Hearing students in the 2/3 class-

room received 179 utterances, an average of 9.8 utterances per student.

Of concern is the low frequency of speech directed to deaf students. This is important for two reasons. First, it points to a difficulty that the teacher may have had in encouraging her deaf students to participate in classroom discourse. Opportunities for linguistic expression and interaction in these classrooms were perhaps fewer than one would find in a special education classroom with only deaf students. Second, the teachers were not signing; thus, teacher sign does not account for the difference in speech toward deaf hearing students. It will be necessary for further research to confirm whether the teacher speech to deaf students is consistently less frequent than to hearing students.

Complexity. The first measure of linguistic complexity used in the Huntington and Watton (1986) study was MLS. Shorter sentences tend to be less syntactically complex than are longer sentences (although there are exceptions). Students exposed to speech with a higher MLS are thus exposed to more complex language input. The MLUs⁴ (in words) of teacher speech from this study appear in the second line of Tables 1 and 2.

Teachers had different MLUs when speaking to their deaf and hearing students. The MLU in the K/1 classroom was 6.69 for deaf students 5.85 for hearing students. The MLU in the 2/3 classroom was 4.22 for deaf students, 7.11 for hearing students. There is an interaction effect in these data not found in the other measures of frequency and complexity. The K/1 teacher used a higher MLU with her deaf students than with her hearing students. Whereas other measures show less complex speech towards deaf students, MLU in the K/1 classroom follows the opposite pattern. The reasons for this are unclear but may be related to the teacher's experience working with deaf individuals.

Huntington and Watton (1986) also analyzed the proportion of questions to statements in teacher speech. Questions require student response, whereas statements do not obligate the student to respond and thus leave dialogue control in the hands of the teacher. Questions are thus more likely to facilitate language use and development than in speech predominated by statements. The frequency and percentage of questions

in teacher speech from this study are shown in lines four and five of Tables 1 and 2. Deaf students in the K/1 classroom received 28 questions (27% of utterances to deaf students), whereas hearing students were asked 64 questions (28% of utterances to hearing students). In the 2/3 classroom, deaf students received 4 questions (44% of utterances to deaf students). Hearing students received 68 questions (61% of utterances to hearing students).

In a third measure of speech complexity, Huntington and Watton (1986) examined the types of questions teachers asked their students. The frequency and percentage of open questions are shown in the last two lines of Tables 1 and 2. The K/1 teacher used 17 (27%) open questions to hearing students and 7 (25%) to deaf students. The 2/3 teacher used 37 (54%) to hearing students and 7 (75%) to deaf students.

Although the focus of this and previous analyses from Huntington and Watton (1986) were on the percentage of open and closed questions, further research may want to investigate the content of these questions as well. Open questions are typically viewed as more beneficial for students and their expressive language development. Yet the content and purpose of the questions may be as important as their ability to elicit student responses. For example, in the following utterance set, the teacher had just finished explaining the assignment for the morning:

T: There we go, okay, so we know what we need to work on.

T: Any questions?

T: Do we know what we need to do?

T: How, how many people am I?

T: How many people am I?

T: How many of you are there to me?

T: How many of you all together are there to me?

T: Why did I ask that question?

T: What do you think I'm worried about happening?

Although an initial tally of open questions would view this passage in favor of linguistic complexity, a closer look raises questions as to the usefulness of this kind of measure. The questions here were used to make students more aware of the pressure the teacher felt managing a large number of individual projects at the same

time. Instead of asking abstract questions about the lesson, many of these open questions referred to classroom behavior. Certainly, closed questions focused on content may focus students on conceptual development more than open questions. Future research could thus analyze not only frequency of open and closed questions, but on their purpose as well.

Inclusive Strategies

Philosophy. A focus on individual differences was the primary component of the inclusive philosophy in both classrooms. Teachers immediately named individual needs and respect for differences in their responses: “We look at all the kids as individuals because it’s a first grade room, both the deaf and hard-of-hearing kids as well as the hearing kids” (K/1). Teachers allowed curiosity of the other students about hearing aids (and other unique traits) to be met by addressing it early, both through classroom discussions and through presentations by outside experts. The strategy was to “get the curiosity out and be done with it. We constantly get new kids in and go over it again. Just not making an issue of it. Just expecting it” (2/3).

These ideas were reinforced in the normal course of events in the classroom. For example, when I was first observing one classroom, several of the students noticed that I wore hearing aids. They were sensitive to the fact that people with hearing aids may have different communication needs. One student suggested that I sit closer to the interpreter so that I could see, assuming that my hearing aids meant that I was deaf. He did not recognize that people come with a range of hearing losses and may or may not use sign language. In response to the student’s suggestion, the teacher did a demonstration. She asked the interpreter not to sign as she invited me up to the room. The class could then see that, although I wore hearing aids, I did not necessarily need the aid of an interpreter. The teacher then helped them reason through this idea, showing them that different deaf students in the classroom had different hearing losses and communication needs, even if they all wore hearing aids.

Students had their own strengths and weaknesses, and the teachers used this in their teaching. A student who was particularly good at reading was in charge of

reading the newspaper article in front of the class. Another who was struggling with particular speech sounds was called on to pronounce a word that would challenge him in a weak area. In this way, the teachers saw inclusion as a shift in how they taught all of their students. “Looking at them as a student and that’s where we need to go. Every child has some kind of issue. You make allowances for whatever issues are at hand” (2/3).

During the interviews, both teachers emphasized that inclusion is for all students, not just those who were previously in special education. “Everyone is as much a part of the learning environment as anyone else. Everyone just feels like . . . respecting people for who they are. Everyone has a need. This is the community. This is very important” (2/3). Ideas behind individualized instruction extended beyond the deaf students and applied to every student, regardless of hearing level.

For these teachers, including deaf students in their classroom encouraged them to change how they envisioned the class as a whole. Individualized education, broadly defined, leaves much room for individual teacher interpretation and implementation. Research on the success of inclusive practices (Deno, Foegen, Robinson, & Espin, 1996; Hocutt, 1996) focuses on the importance of addressing the specific needs of the “included” child. In this study, the teachers’ philosophies went beyond the included child and extended to the other members of the classroom. Although the motivating factor for individualized education was to include deaf students, hearing students were, in theory, also affected by the new teaching agenda.

Cited strategies. Research from *JDSDE* (4[3], 1999) identified communication and individualized instruction as predominant themes in inclusive classrooms with deaf students. Teachers in these classrooms approached individualized instruction from a variety of angles: small class size, deaf culture, and student advocacy. The first strategy, limiting class size, relates specifically to previous recommendations regarding classroom layout and access (Vaughn & Schumm, 1996). The second two, however, were not part of either the general recommendations for inclusion or themes that arose in the *JDSDE* issue on inclusion with deaf students. Furthermore, these teachers did not identify the

primary strategy from that issue: an emphasis on communication with deaf students. Adjustments to or accommodations through spoken language, specifically, were not deliberately identified as an inclusive strategy for deaf students.

1. Class size. The teachers emphasized the importance of a reduced class load for successful inclusion. This position was reiterated several times: "Keeping the numbers down so that they can receive the individual attention. If they were in a bigger room they would not be addressed as well" (2/3). The teachers felt that an individualized approach requires smaller classes. Teachers could spend more time with each individual student: "We get to know the kids a lot sooner. I know where the students' strengths are. I can build upon the strengths and go from there. I group the kids, work with them individually. The kids don't fit into the curriculum, the curriculum fits into the kids" (K/1).

These two classes were smaller than average early elementary school classes; the K/1 and 2/3 classrooms had 15 and 18 students, respectively. Regular education classrooms can enroll 25 or more students, depending on district guidelines and space limitations. Even though special funding programs help lower class size in this school, the K/1 room had seven deaf students, an exceptionally high number in one room. Indeed, the teacher said that she was over her limit; typically she would have one or two fewer students.

Although an inclusive classroom is not a special education room per se, it does have qualities that require similar resources, space, and enrollment limitations. The size of the class becomes part of the special education services brought into the general education classroom. For example, if deaf students are to be encouraged to participate, a lower student/teacher ratio should allow the teacher to increase the number of initiations he or she makes to each student. The teacher can rely less on whole group instruction and more on individual interaction. The anticipated result is more opportunities for linguistic expression and language development. This strategy ties specifically to the general recommendation made by Vaughn and Schumm (1996), to tailor the physical layout of the room to make learning as accessible as possible.

2. Deaf culture. Both teachers focused on areas of deaf culture to improve their interactions with deaf

students. The first was to have some facility with sign language. Confidence in one's ability to communicate with students, even with an interpreter present, was seen as critical to comfort with deaf students in class. The K/1 teacher was fluent in sign language and was able to understand her students' sign language. (It was difficult to decipher.) The 2/3 teacher had less exposure to sign language: "If I'm just watching I am fine, but then I just freeze. I need to get over that hump. I love it and would like to get more fluent." She demonstrated skills with individual words and phrases, but did not yet engage in signed dialogue with her students.

Fluency in sign language is but one part of deaf culture. The K/1 teacher emphasized how important it is to understand the deaf world as much as possible: "Have to be in the deaf world. Join a deaf club. Get involved with the families and learn from them. Just being there and being a part of everything. It's a different world." Interestingly, both interpreters and the K/1 teacher came from families with siblings or parents with hearing loss. Their backgrounds were valuable additions to these inclusive classrooms. Exposure and sensitivity to aspects of deafness that extend beyond sign language would be beneficial for the deaf students; teachers who are not trained as special educators may not otherwise be aware of them.

3. Advocacy. Teachers and interpreters reinforced ideas of student responsibility and rights in both their teaching philosophy and in their practices. Even though they are young, the students were responsible for managing their own amplification systems. For example, students had to get their FM systems on in the morning, have fresh batteries in them, bring them to the audiologist to be checked, and bring the teacher microphone to her if she did not have it at the beginning of the activity. Because of the number of adults in the room and the structure of the lessons, the microphone changed hands several times a day. Students were expected to help keep track of where it was and when it should be given to a new speaker. There were several times during my observations when the teacher did not have the FM microphone at the start of a lesson. Instead of going over and getting it herself, the teacher waited, making it clear that something was missing, and refrained from telling the deaf students

outright to go get the FM microphone. During the interview, the teacher said she did this to encourage responsibility in her deaf students.

Students also had to request an interpreter for situations that required communication assistance. For example, when the physical therapist came into the room, the students had to ask the interpreter to come help communicate with the therapist. Teachers said that students had a right to have an interpreter but needed to be proactive in obtaining that assistance. Sometimes the staff would intentionally hold back to show students when to ask for help. For example, one student needed to have assistance with some medication. Although the interpreter knew what the student required, she waited for the student to initiate communication.

As described in the previous section, teachers' inclusive philosophies were similar to those in previous research in their focus on individual students. The teachers did not, however, address their own communication with deaf students (interpreter-student communication is discussed in the next section). Questions regarding teaching strategies did not generate specifications on how they talked to, used visual aids, or used sign language with their students. Although analysis of teacher speech, particularly in the 2/3 classroom, showed different patterns in speech toward deaf students and hearing students, teachers did not name using simplified speech or asking questions as part of how they met the individual needs of their students. Building on pragmatic language skills within advocacy efforts was the only specific language strategy identified. This is striking when one considers language to be the primary delay for young deaf students and communication a significant challenge for regular education teachers.

Interpreter's Role

Communication. Previous research on inclusive classrooms with deaf students have left unexplored the different aspects of an interpreter's role (*JDSDE*, 4[3], 1999). Though much of his or her role may be intuitive, we do not know much about how the interpreter specifically facilitates communication between regular education teachers, deaf students, and hearing students. The purpose of this analysis was to provide examples

of the interpreter's role in classroom communication. In these classrooms, the interpreters' primary role was to translate the teachers' spoken language. During the interviews, teachers said that the interpreters were in the rooms for the majority of the school day, although not present for all students at all times throughout the day. Substitute interpreters filled in when the full-time interpreters could not be present. Both of the interpreters used a mixture of American Sign Language (ASL) (sometimes) and contact sign (sometimes). Coverage of teacher speech was comprehensive; the interpreters signed all but a few utterances throughout the observation periods. The interpreters were able to give more complete translations when there was one speaker than when there were multiple speakers and topics. The lag time between speech and sign meant that the interpreters sometimes abbreviated or combined sentences in teacher speech. Classroom observations were not, however, sufficient to allow the analysis of the complexity and accuracy of the sign language interpretation.

Working with several adults in the room required communication and flexibility between team members: "Being accepting of other adults in the room, that can be difficult. . . . There are teachers who have always had their room and it can be difficult to be accepting. By having more adults you need to brainstorm ideas and it is just more fun but you have to be willing to let go a little bit" (2/3). Some initial adjustments working with other adults related to functional changes. Instead of having free reign of the front area, the teacher had to account for a second communicator. When she first started, the 2/3 teacher had to adjust where she stood in the front of the room: "Don't walk in front of the interpreter! I was learning about physical space. The interpreter would just quietly move over. I kept stepping in front of her."

In addition to translating teacher speech, the interpreters served as a voice for students whose speech was not intelligible. Sometimes deaf students would use only sign language; the interpreters then voiced the students' sign for the teacher and the rest of the class. In this way, the interpreters helped give deaf students their opportunity to respond in a group discussion and participate in classroom dialog. It also helped the hearing students see deaf students perform: "Deaf kids can

do stuff too. She can count. Reverse interpreting helps reiterate that for the rest of the class” (K/1).

The interpreters also assisted the deaf students in communication with their peers. In some cases this was done informally by helping the deaf students get someone’s attention. Other times this was more formal, voicing a deaf student’s signs or interpreting a friend’s speech. The interpreters sometimes signed what other students were saying even if it was not directed to the deaf students. In these situations, the interpreters often chose comments that related to what the student was doing. For example, a deaf student was working on his project cover and a peer announced that he had found a special picture for his own cover. At this point the interpreter directed the deaf student’s attention to the picture and translated what he had said. This way, the deaf students had some interaction with the “background noise” that occurs when a classroom has simultaneous conversations. The deaf students could, in a sense, “overhear” what a peer was saying; this gave him an opportunity to participate that would not otherwise be available.

Although helpful, there were limitations to how fully the interpreters could include the deaf students in classroom conversation. First, the interpreters could not interpret all speech in the room. The deaf students only “heard” a few comments in addition to initiations directly made toward them. Unfortunately, these were few. Hearing students did not initiate contact with deaf students, particularly in the 2/3 classroom. Furthermore, the interpreters, not the deaf students, directed what speech was translated. Deaf and hearing students did not communicate with one another directly but relied on the interpreter, who is not a peer, to facilitate conversation. The adult presence might have actually reduced the quantity and quality of spontaneous interaction between deaf students and hearing peers.

Other roles. The interpreters’ impact went beyond the communication needs of deaf students. When the teachers were speaking, the interpreters tracked whether the deaf students were attending to, and understanding, the material. Sometimes the interpreters repeated instructions for students who seemed confused. If deaf students were not watching, the interpreters would direct their eyes to the front of the class. One student had a difficult time paying attention to the

interpreter. Both the teacher and interpreter expressed concern that this student rejected help. During my time observing, the interpreter repeatedly cued this student’s visual attention toward her. Later conversation with the interpreter indicated that this has helped the student’s attention improve significantly over the course of the school year.

The interpreters and the teachers worked together to establish and implement behavior guidelines. For example, one deaf student often did not wait for his turn to speak. When he interrupted (by signing while the teacher was speaking), the interpreter voiced for him as if he was talking out of turn. The teacher and the interpreter then responded accordingly, reminding the student to raise his hand and take his turn like all other students in the classroom. “This makes him more a part of the classroom. He learns when he can interact. The interpreter is not just his private person. This helps enforce fairness of rules. The expectation of behavior is the same” (K/1).

These interpreters performed some duties that are not the normal responsibility of interpreters. Although primarily assisting the deaf students, the interpreters’ presence also helped monitor the behavior of hearing students. They helped to manage the noise level of the classroom by using eye contact and physical presence to guide children’s behavior. They watched the class when the teachers were at the blackboard, assisting both the deaf and hearing students. For example, when the teachers were dealing with a single student, the interpreters fielded questions, using both speech and sign language to respond to hearing students. Interpreters also eased transitions between activities. At the end of one activity, the teacher left the group to set up the next project. The interpreter was in charge, inviting individual students to come present their idea in front of the class while the teacher got out crayons and worksheets. The 2/3 teacher commented about her interpreter: “She has as much input as anyone else. She sees a lot more because she has her eyes on the kids while I am at the board doing stuff. She can see what’s going on.”

With all of these tasks, there were several roles that the interpreters did not fill. They were not teachers of the deaf, speech therapists, or audiologists. In this way, their role was focused. It was clearly the interpreters’ role to translate teacher speech, and that role was ex-

clusively theirs. Although the K/1 teacher was fluent in sign language, she was careful to let the interpreter maintain her position in the room. During one observation period, there was a shortage of interpreters, and some discussion on whether the teacher could “sign for herself.” She was reluctant to do so, not because she did not have the skill, but because it was not a part of her legally defined role.

Areas for further investigation are many. A number of recent studies on inclusion focus on how team members collaborate and work toward implementing teaching strategies (Antia, 1999; Gaustad, 1999; Jimenez-Sanchez & Antia, 1999; Luckner, 1999). These studies looked primarily at the relationship between the general and special education teachers. The interpreter’s relationship to both these parties would be a useful extension of these findings.

Akin to spoken analyses made in this study, an analysis of sign language input would help in evaluating the total language environment. This input is important both for comprehension and sign language instruction. Most of these students did not receive specific sign instruction outside of the classroom and came from homes with hearing parents. Tracking sign language development, as well as spoken language gains, would be a valuable outcome measure in evaluating the inclusive language environment.

Interpreter involvement in interaction between deaf students and peers is a third potential area for research. Does the interpreter facilitate peer interactions? Does adult involvement discourage peers from initiating communication? The quality and quantity of peer interactions with and without an interpreter’s assistance is particularly relevant for deaf students who do not have signing peers with whom to communicate directly. The shift to an inclusion classroom with hearing students (and do not sign) may otherwise be an isolating experience.

Conclusions

This study investigated spoken language, inclusive philosophies, and teaching strategies in classrooms with deaf students. This study highlighted themes that may be useful in working with deaf students. This includes providing sufficient language input to make the deaf students a part of the classroom dialogue, while at the

same time directing speech at an appropriate language level for the student. Inclusive philosophies may influence the teacher’s approach to all students, thus influencing the optimum size of the class, curriculum choices, and assessment accommodations. The interpreter, at times perhaps the only fluent communication partner for deaf students, may play a unique role in how inclusive strategies are implemented.

This study used a variety of methods and analyses in its approach. Although interviews and descriptive data analyses work well for understanding philosophies behind teaching strategies, quantitative methods are needed to assess the impact of these teaching strategies. Combining contextual information with objective measures will assist the field in developing its understanding of the effectiveness of inclusive teaching practices.

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Notes

1. This article uses “deaf” to refer to students with severe to profound hearing loss. However, Hyde, and Power (1992) demonstrate that this may be a misleading designation, as the communication needs of severely deaf and profoundly deaf are not always the same.

2. A T-unit is the “smallest number of words that make up a meaningful syntactic unit. This may involve a whole sentence, or in a complex sentence may also involve subordinating clauses” (Power, Hyde, & Leigh, 1996, p. 125).

3. This study looks at the role of an educational interpreter. There can be other professionals who translate in a classroom setting, such as an aide who signs or an “interpretutor.” The focus here is on interpreters who translate teacher speech in front of a classroom and not in a tutorial setting.

4. Original transcriptions of speaker utterances were disaggregated into sentences in order to compare reasonably the MLU with the MLS (mean length sentence) measure taken in Huttington and Watton (1986). There are, however, several limitations to this approach: Comparisons cannot be considered an exact match between the studies, and segmentation was not done by the transcriber but post hoc by the researcher.

Appendix

Questions used in general education teacher interview:

1. How long have you been teaching deaf students in an inclusive setting?
2. What has this experience been like?
3. If you had to advise a new teacher in this situation, what are some strategies for effective inclusive teaching that you recommend to him/her?

4. What is your approach to inclusion?
5. What kinds of activities do you implement in your classroom to further this vision?
6. What, if any, adjustments to classroom layout, assessment, curriculum, etc. do you make for your deaf students?
7. What, if any, issues have arisen with working within an inclusive team? With the interpreter?
8. How are the deaf students doing this year? (Each student with parent permission addressed individually.) Academically? Socially? Language?
9. What do you use as feedback/information on how your students are improving?
10. What is the parent participation like in your classroom? In your students' progress?
11. What kinds of planning time have you and your team had? What occurs within those planning periods?

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