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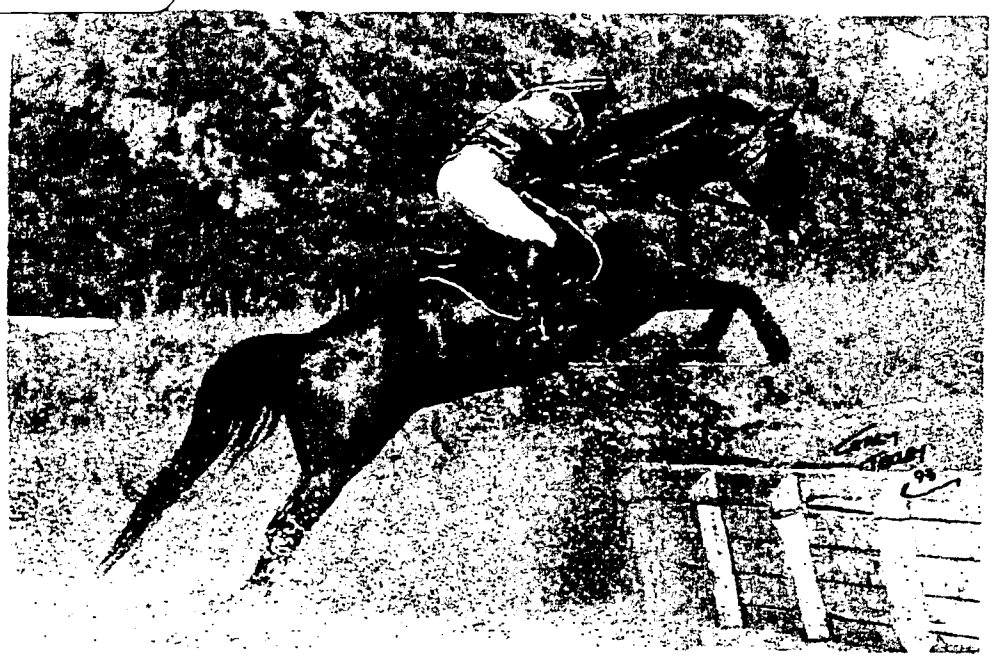
ABSTRACT

This collection includes conference papers on the education of the deaf and hard of hearing, including: (1) "Discovering Classroom Dynamics through Action Research: Strategies That Encourage Critical Thinking during Lectures" (Keith Mousley and Vicki Robinson); (2) "Current Literacy Practices That Are Working" (Henry Teller); (3) "A Prototype Research Approach Using ASL as a Primary Research Language with Printed English as a Secondary Language" (David Mason); (4) "The Hopwood Case: Its Effects on University Teacher Training Programs in Deafness" (Gabriel A. Martin); (5) "Constructing Inclusive Classroom Models That Serve Deaf and Hard of Hearing Students: Reports from Teachers in the Field" (Deborah Haydon and Karen Dilka); (6) "Including Competencies for Itinerants and Resource Room: Teachers in Preparation" (Carolyn Bullard and H. William Brelje); (7) "Problem Solving and Deaf College Students: Issues and Strategies" (Ronald Kelly and Keith Mousley); (8) "Co-Teaching Deaf and Hard of Hearing Students: Research on Social Integration" (Thomas Kluwin); (9) "Focus on the Classroom: Students as Synthesizers and Evaluators of Web-Based Instructional Units" (Pamela Luft); (10) "The Development of a CD-ROM To Teach Speechreading Skills" (Samuel B. Slike and Dorothy H. Hobbis); (11) "Comparison of Competencies of Cochlear Implants between Teachers of the Deaf/Hard of Hearing versus Speech-Language Pathologists" (Thomas W. Connolly and Gerald Powers); (12) "Reading Strategies: What Deaf Students Can Do" (Sandy Bowen); (13) "A 'Teacher Friendly' Language Assessment Instruction: Normative Data on Basal Readers" (Alfred H. White and Paula L. Scott); and (14) "The Effects of Computer-Mediated Communication on the Literacy of Deaf and Hard of Hearing Adolescents" (March Jones, Karen Kimmel, and Susan Brooks). An agenda of the conference is attached. (Each paper includes references.) (CR)

ASSOCIATION OF COLLEGE EDUCATORS OF THE DEAF AND HARD OF HEARING 24TH ANNUAL CONFERENCE

COLLECTED PAPERS



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DISCOVERING CLASSROOM DYNAMICS THROUGH ACTION RESEARCH:
Strategies that encourage critical thinking during lectures

KEITH MOUSLEY
and
VICKI ROBINSON

Today, in our work, most of us are using high tech. This is the computer age, we are using the scanner, superhighway, electronic mail, and other electronic options that are too numerous to mention. Do we still have to think?

In the old days, students were responsible to go to class, take notes, go back to their home or dormitory to do some studying and prepare for quizzes or tests, or even going to the library to do some research for writing term papers. Doing research papers was a little painstaking: we had to go to the catalog file or microfich to get the information that we needed. Some of us ran to the copy machine to copy some articles. It required physical activity to do the projects. Oh yeah, we had to buy tons of whiteout or buy special erasable paper so we could type the term papers. Were those the good old days?

Now, we can just go home and turn on the computer and get to work. Hardly any muscles are moving to do research papers. We can click on whatever we need, copy it somewhere, rearrange the information, use spell check, use grammar check, and push the print button. Are we thinking more or less? Or are we becoming managers of information?

This is a challenging era for us as educators at any level of teaching. I have taught science and mathematics at the middle school, high school and college levels. For the past nine years, I have been teaching mathematics at NTID/RIT. For me my work now is not so much "paper and pen" work; it is more on what Texas Instruments calculators can do for us. These changing times are a good time for us to focus on analyzing hi-tech and traditional approaches in the classroom.

This is a good time for us to start thinking about how to use action research to determine the direction of our teaching methods into the next millennium.

If you are like me, we are facing the new era with both old methods and new methods. We are all struggling as technology overtakes our traditional methods.

What I would like to do is to talk with you about my experiences in the classroom, and why and how I became involved in action research. "Action Research" is a term to describe professionals studying their own practice in order to improve it. According to Feldman (1996), action research can be divided into two types. The first involves reflecting on teaching and student learning. Data are collected throughout the school year from student work samples, anecdotal notes, and teacher reflections. The second type of action research is a problem solving process in which teachers focus on a problem and ask questions about it. A plan is developed to collect more information about the problem, draw conclusions, and potentially solve the problem. Hopefully, you will be able to apply some of these ideas in your own classrooms and eventually find your answer to the classroom/instructional challenges that you face.

As an educator, my frustration is that today students lack skills in the area of critical thinking. Students seem to be out of practice in thinking out loud in any form of communication. By "out loud," I mean out loud. They are not able to express themselves as to how they arrived at their conclusions. For the past 16 years in the classroom , I have noticed that the students who grew up in deaf families seemed to have better problem-solving skills in both math and science than those who grew up in hearing families. I posed a hypothesis to myself that maybe more deaf students should have more training in ASL and then all of them could do a better job in analyzing their critical thinking, but that was just my opinion. I needed to prove it. In the spring of 1993, I was on a committee and happened to be talking with Ron Kelly, Chairperson of NTID's Educational Research Department, about my thoughts that students with strong ASL

backgrounds do a better job in problem solving. For the past five years, Ron and I have been doing research on teaching problem-solving . There is an old saying that you learn a lot by doing . I have learned a lot by doing this research project. As I explain the research, think about what you would like to do when you go back home.

After researching current literature on deaf students and problem solving, we decided to focus on critical thinking skills necessary for successful problem solving and then look at the language issue. The literature talked quite a bit about impulsivity. We decided to address this issue in our research. When we teach any topic, students tend to jump in and say, "Oh I know!", or "I heard that before",or "not again" and so forth. Such impulsive behavior not only results in failure to solve the problem at hand, but can also hinder one's learning which is built on experience because of the lack of analytical and reflective thinking. In Campbell's 1989 research study, impulsivity is defined as " a characteristic of cognition that results in failure to reflect on the appropriateness or correctness of a solution to a task or response to a problem, particularly when the task or problem is perceived to contain high ambiguity or uncertainly". Furth in 1973 suggested that such impulsive behavior may be related to limited language (English) abilities that result in stress and frustration when trying to deal with or clarify ambiguous situations.

We know that to increase critical thinking, we need to prevent students from jumping on the problems. One strategy is to use visualization. You have probably heard some advice, namely "WAIT TIME". This is almost the same thing. Visualization is giving students opportunity to think about and analyze problems before doing them. During the research project, we have been using the Tower of Hanoi (Demonstration). We noticed the students quickly dove into the puzzle without really thinking about it. So we came up with a strategy: we used a stopwatch. We asked the experimental group of students (the visualizers) to think about how to solve this game for about 2 to 3 minutes. They could not start until we told them to start.

Interestingly enough, that was a tough task for them. They had to restrain themselves before starting. That is probably a lifelong habit that they have developed. The other group (non-visualizers) were allowed to plunge in!

TABLE 1: Average number of moves and times on the Tower of Hanoi puzzle per group.

	Average number of moves	Average time
Visualization (n=7)	19.9 moves	1.3 minutes
Non-visualization (n=7)	35.1 moves	2.3 minutes

From the chart, the visualization group performed more efficiently in term of fewer number of movements to solve the problem and this difference was statistically significant, t= -2.315, do=12, $p<.05$. This is just an example through action research of what I have learned. Now, I make every effort to provide opportunities for visualization in my daily lectures. I challenge you to think about it during the presentations at the entire conference. Stop now , and visualize the key points of my message so far. Now jot them down.

Another strategy that encourages critical thinking is vocalization; thinking outloud in any form of communication. This is recommended by Woditsch (1991) to help hearing students develop their own critical thinking patterns. Ron and I decided to look at this idea of modeling our thoughts outloud in situations that required some thoughts or brainstorming. The students' tendency is to struggle with the kind of general reasoning skills that can be applied to a variety of specific problem situations. These are the metacognitive skills that Loera and Meichenbaum (1993) and Martin (1993) argue are critical to literacy development for deaf learners, specifically the cognitive functions emphasized by Feuerstein (1980) such as taking note of complete data available, being systematic in exploring all of the options, being precise, focusing on relevant information only, and overcoming random trial-and-error behavior and others. Hearing students

have opportunity to develop those skills through incidental learning. Deaf students do not have that opportunity. Who is the true role model of this wonderful thinker that deaf students can look up to? We are, and we must be overt in our demonstration of our thought processes to ensure that deaf students realize how carefully we undertake these cognitive functions.

For our research project, Ron and I created questions that relate to what students do everyday. We deliberately created questions that have no real right or wrong answer. To avoid the one-answer scenario, we needed to brainstorm questions that required true divergent thinking. Remember, these are college-level students. We tried to think of real life situations. We chose three questions. Let me share one of those questions with you. This will take you back to your school math days!!

> Jane and Jean have only 18 hours to drive 1000 miles. Jane drives 70 mph most of the time, while Jean generally drives only about 55 mph. How much time should each one drive to complete the trip on time including two restaurant stops and two gas stops? What would also be the estimated costs? Explain your answer in detail.

We set up two comparison groups; one group received "training" and the other group did not. The training group was "trained" with a professor being myself who "vocalized" his thinking out loud by signing and speaking his thoughts as he analyzed, solved, and explained the problem. I did not hold back any information and took the time to include all relevant details of the analytical modeling process. For example, for the above problem, I took 55 minutes to solve it. , Basically, I used the estimation method. I estimated who was driving for how long and when they took turns to drive. If Jane drove three hours and then Jean drove for two hours, that means Jane and Jean covered about 320 miles. I continued doing this until I reached 1000 miles. During this process, I set up a travel itinerary.

The toughest part was analyzing the student data. That is the beauty of working with a researcher. Here is an example of how we did it.

The following table shows the results of a comparison of students who had been trained to use the thinking out loud process vs students without the training.

TABLE 2: Observed frequencies of students who successfully considered all available information and explained their answers for three word problems.

	(pre-training) Word Problem 1		(post- training) Word Problem 2		Word Problem 3	
	all Info		all Info		all Info	
1. Training (n=10)	3	1	8	6	7	6
2. No-training (n=10)	5	2	3	1	5	1

Without getting into a deep statistical analysis of the results, the results show that the training using the teacher's modeling of the problem-solving process positively influenced the performance of the students for identifying and considering all available information and fully explaining their answer with subsequent math word problems. In contrast, the non-training control group of students did not show a similar pattern. I remind myself while I am teaching, DON'T THINK QUIETLY. Again this assessment has helped me to provide more opportunities for critical thinking in the classroom. Student feedback has been positive. Comments from students include:" I never really thought of doing it that way", and "Gee, you mean I have to think of all different options?

I cannot do this for every lecture. Using your judgment and your values, decide when to use it and when not to use it. It is a time-consuming and believe it or not, an energy draining process. The research shows that students benefit from my demonstration of the entire thinking process. I have made efforts to include this strategy in my lesson plans.

Cooperative Learning is another strategy which encourages critical thinking. This is a popular method that is being used more and more in the classroom even at the college level. Is this method working? What do I mean by working? Are the students thinking more as compared to just listening to the lectures. We incorporated this strategy into our research. Our focus was to study the interactive dynamics among the students. We also wanted to see if the interaction would help students change and clarify their thinking. We randomly assigned students into two and three member teams to solve three problems. This team problem solving interaction was videotaped for analysis.

Theoretically, a team approach provides the opportunity for students to learn from one another and to participate in give-and-take discussions in which everyone has the chance to contribute. Unfortunately, it does not necessarily work as smoothly in practice. Through analysis of the videotapes, we identified various behavior types and came up with the following chart of:

TABLE 3: Informal Assessment and match up of behavior types

	person #1	person #2	person #3	success
1.	Observer relies on memory	Take-control Disruptive		no
2.	Organized relies on memory self-initiative	Take-control disruptive relies on memory		no
3.	Low motivator Quiet	Doer		no
4.	Quiet assurance	Quiet, try to include others assurance		yes
5.	Listener observer	Talkative/ listener	Relies on memory Organized	yes

			Self-initiative	
6.	Listener observer	Talker/listener Doer		yes
7.	Quiet Needs assurance	Talker/listener Thinker		yes
8.	Take-control no/yes Disruptive	Quiet memory	low motivator Quiet	
9.	Talkative Listener	Quiet Assurance	Take-control Disruptive	no
10.	Quiet Assurance Thinker	Very quiet Thinker		yes

The results showed that to successfully implement a team problem solving experience, we need to take care in assigning and matching students to groups based on a type of classroom behavior. Otherwise the purpose of the team approach may be defeated. Students who are good listeners and willing to either give feedback, or encourage feedback from others, seem to function best in team problem solving situations and everyone gets an opportunity to participate and contribute. These results have provided me with a better understanding of what consitutes success in team problem solving. When the option arises to use this strategy of cooperative learning, it has provided my students with tremendous opportunity for critical thinking.

My original question led to other questions. Does language really have any influence on how to improve problem solving skills. Does a higher reading level indicate that a person can handle problem-solving skills better? This brings us to our fourth area. For this research, we used the Tower of Hanoi, and open-ended word problems. In the Tower of Hanoi, after the students completed the puzzle, we asked them to write down how they solved it. We asked for detailed explanations. Then, we asked the students to explain again on the videotape, using sign

language, how they arrived at their conclusions. Immediately after that, they were given word problems for example:

Shirt sale problem. Terry was out shopping. He wants to buy one or more shirts. He saw a sign in one store that stated BUY 2 SHIRTS, Third one is FREE. The cost for each shirt is $14.60. He went to another store and saw a sign 30% Discount for a $14.75 shirt. Which situation is cheaper to buy? State your reason(s).

TABLE 4: Student average performance scores for explanations in both sign language and written form.

	Tower of Hanoi		Math word problem	
	Written explanation	Signed explanation	Written explanation	Signed explanation
Higher Reading level (10.3-11.1)	49.8	58.2	72.0	78.0
Lower Reading level (6.9-9.7) (both n=5)	33.4	63.0	58.0	52.0

The results show that using word problems, students with the higher reading levels were able to give a more detailed written explanation of how they solved the problem than the students with the lower reading level. Students with the lower reading levels were able to express themselves, using sign language, in more detail on how they solved the Tower of Hanoi problem than with the word problems. This information is useful in the student assessment process.

In the beginning, I had one question. Throughout my research, I discovered I had more

questions, and also more answers. This question led us to research various strategies that encourage critical thinking during lecture. We talked about visualization, model thinking, team problem solving, and language. Using various data analysis, this research led us to believe that students do a better job in problem solving if they have a good control of **any** language. This research is ongoing. Ron Kelly and I are continuing to explore strategies that encourage critical thinking skills during lectures.

The purpose of my presentation up to now has been to explain my research and to show its benefit to myself and my deaf students. Now, I would like for you to think about your own situation and how you can use action research in your discipline.

According to Oja and Smulyan (1989), action research projects have three general aims: staff development, improved school practice and the modification and elaboration of theories of teaching and learning. ..... Improved practice results from practitioner participation in the investigation of actions and issues of immediate importance.

If you want to become involved in action research, Cox and Craig in 1997 describe five steps for getting started with action research.

1. The teacher should become familiar with action research studies published in educational journals. These studies serve as excellent examples of action research.
2. Problem Formulation. The teacher identifies important classroom-centered problems and issues by stating questions about them.
3. Data Planning and collection. After formulating the questions to answer, the teacher determines what population of students to involve in the study.
4. Stating Conclusions/Sharing Results. After gathering and analyzing information, teacher determines what was learned as a result of the inquiry.

5. Implementing Changes. This step entails putting the results to work in the classroom.

Specifically, this translates into developing a **practical plan** that should include the following:

1) Develop the goal.

   What is/are the problem(s)?

   What are your questions about the problem (i.e., what are you curious about)?

2) Find out more about research.

   One way to do it, is to pair up with a researcher or another person who has some knowledge of research.

3) Develop a data collection and analysis plan.

   What information/data are you going to collect?

   How are you going to analyze it?

   How would it benefit the students?

In developing a plan, it will be helpful to keep in mind some effective assessment strategies. In a workshop Vicki Robinson and I gave earlier in the conference, we talked about Angelo's and Cross's Eight Essential Characteristics of Effective Assessment. These are:

1) Assesses what is actually taught.
2) Provides information for improving learning.
3) Focuses on the processes as well as on the products of instruction.
4) Actively involves both teachers and students.
5) Uses multiple and varied measures.
6) Is carried out at various points during the term of instruction.

7) Provides useful, timely feedback to those being assessed and those most affected--the students and teachers.

8) Is an intrinsically educational activity -- one that reinforces and furthers the teaching and learning goals it focuses on.

4) Analyze your findings and decide how to use them.

How can I apply this to my classroom?

5) Try it out, evaluate it, and make a conclusion.

Go back to #1.

Remember this is an ongoing process. You will always be learning something new each time you start to assess the situation. Keep an open mind and enjoy the process.

To conclude, let's go back to the beginning, to my original question. Do deaf students who have strong ASL backgrounds do a better job in problem solving than deaf students in hearing families? This question led me to research various strategies that encourage critical thinking during lectures. We talked about strategies such as:visualization, model thinking, and team problem solving, and language. This research answered my original question by showing me that students do a better job in problem solving if they have a good control of **any** language, whether it be ASL or English or any other language for that matter.

When you are doing action research or any kind of assessment, you may find many surprises! But you also may find that your research results verify what you already assumed. Your findings will probably lead to other questions and issues. Education is an exciting field with

many challenges: action research helps us to meet those challenges.

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CURRENT LITERACY PRACTICES THAT ARE WORKING

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Abstract

Fifteen outstanding preschool- and elementary-level teachers of the deaf, regular elementary teachers, and a reading specialist whom had adopted a whole-language approach to literacy were interviewed. They responded to questions regarding how they taught, what they taught, how their classrooms are organized and governed, how they communicated with parents, what their students read and wrote about, how they met individual differences among their students, how they stayed current professionally, and how they evaluate their students. All indicate that they were pleased with the progress their students had made during the school year, and that they realized greater gains through a whole-language approach to literacy than they did through the traditional methodologies they were using previously.

Some Current Literacy Practices that are Working

Fifteen preschool- and elementary-level teachers of the deaf, regular elementary teachers, and one reading specialist, identified by their school systems and/or university teacher training programs as outstanding teachers, who had incorporated a whole-language approach to literacy, were interviewed. These teachers were employed at a state school for the deaf, a public elementary school program for deaf children, and public elementary schools in the states of Mississippi, Louisiana, and Illinois. A literature review of whole language practices with the deaf students and whole language practices applicable with deaf students was also conducted.

Premise of the Study

It was a premise of this study that language is social and should be used in meaningful ways (Burch & Teller, 1996). Whatever is language is learned like language and acts like language. All languages--oral, written, or signed--share certain characteristics.

- o They are profoundly social.
- o They contain interdependent and inseparable subsystems.
- o They are predictable (Edelsky, Altwerger, & Flores, 1991).

Children learn language in a holistic way, in the context of genuinecommunicative events--real communicative transactions with other people--in which the characteristics of the participants, their purposes, the context of the situation, what is being communicated, and the language used are all important (Goodman, Smith, Meredith, & Goodman, 1987). Children learn reading and writing through real reading and real writing, not through doing reading and writing exercises (Edelsky, Altwerger, & Flores 1991). Children almost spontaneously enjoy

reading and writing about topics in which they have a personal interest (Burch & Teller, 1996).

Well-run classrooms engage students in language activities that have genuine communicative intent. They provide students with real reasons for reading, writing, speaking, or listening. Curricula that engage students in activities that genuinely meet their needs, purposes, interests, and experiences are fun, relevant, and meaningful (Vacca, & Rasinski, 1992).

Teacher Interviews

The following is a summary of the responses of these 16 outstanding teachers of deaf and regular elementary school children to 11 literacy questions.

1. What do you think about whole language?

Every teacher interviewed was delighted with the results they had achieved through the application of a whole language approach to literacy. They liked building upon the child's existing language and the early incorporation of reading and writing activities. They especially liked using children's literature to teach the language arts.

2. What do you do at the beginning of the school year?

There was an emphasis on activities which teach children to work independently and build positive self-concepts. There were daily opportunities for purposeful reading and writing.

3. How is your classroom arranged? Classes were arranged for children to work in small groups and collaborate throughout the day. There were a variety of learning centers and places for children to get comfortable in a private space for silent reading.

4. How is your class organized and managed? Some of these excellent teachers used an authoritarian approach but gave the students many daily choices to achieve their goals. ("Do you want to read aloud or with a partner?" "Do you want to write in the room or in the library?") Others developed class rules with the children and use a points system for rewards. Others emphasized showing respect in everything the students did as a guide for behavior.

5. A Writing Topics Early writing may be marking on paper and telling the teacher what they had written or drawing a picture and writing something about it. There was an emphasis on daily purposeful writing--whether it was to communicate with the teacher, to correspond with pen or key pals, or to keep a literature journal about what they were reading.

5. B Describe your writers' workshop. Early writers' workshops have consisted of drawing a picture and writing about it, to doing a story map. ("Early in the year they draw a picture and write about it. Now (spring) they do a story map.) As the children began to write independently conferencing with the teacher and among the themselves was highly regarded. Children learned to do revisions and were expected to publish there better writing.

5.C Dialogue writing. Dialogue writing with the teachers was deemed useful for the natural development of good English expression and developing mutuality and good rapport with the students. Teachers of the deaf saw great progress over the year through dialogue writing.

5.D Other writing. Other writing included writing original stories based upon themes in literature the children were reading, writing pen pals, keeping school news journals, and literature journals.

6. How do you communicate with parents? All teachers interviewed placed high importance upon regular communication with parents and guardians. This communication took many forms including writing notes, sending home class work, newsletters, conferences, TDD calls, and daily visits with parents when they picked their children up after school.

7. What do you do to stay current in whole language? All teachers interviewed read the current literature for new literacy ideas to try in their classrooms. All attended local and district workshops, and a few attended national conferences and took university coursework.

8. Challenges. Several teachers indicated that some early challenges came from parents who were expecting their children to be taught with the traditional basal reader and drill sheets,

but once they saw their children's progress through whole-language activities, the resistance stopped. One teacher cited that it was a challenge getting used to noise level from letting the children interact. It was also a challenge for her not being in front of the class doing all the talking, but rather serving as a guide to them.

9. Do you incorporate a basal reader? Most teachers did not use a basal reader. Those who did used only selected stories which were read as pieces of literature. Two teachers used the basal for skill exercises, while one teacher took the skills taught in the basals and incorporated them into the children's literature which they were reading.

10. Typical Day. These teachers almost universally engage their students in literacy activities and mathematics early in the day and did other academic subjects such as social studies and science after lunch. Many literacy and other academic experiences were presented in game format or with creative twists to make them personally interesting and appealing to the students. Free reading opportunities were in morning and afternoon.

11. What books do the students like? Younger children tended to prefer and enjoy predictable books such as Carle's The Hungry Caterpillar. Older elementary students liked mystery books, survival books, and books about children about their age and with similar interests and problems. There was a universal fondness for the books of Mercer Mayer, Tomie dePaola, Eric Carle, Cynthia Lowery, Mark Brown, Arnold Lobel, Nancy Carlson, Bill Martin, Ezra Jack Keats, and other popular writers of children's literature.

12. Individual Differences. An emphasis was placed on teaching students to work independently and make sense of things. This frees the teacher to help individuals around the room. Having children work in centers also greatly aided individualization within the center activities. At the centers there were great opportunities for individualization in reading within each class.

13. Evaluation. Evaluation techniques among the teachers showed much commonality. To verify yearly progress some gave the actual basal skills tests. Others evaluated their students skills in literature from basal tests at their grade level. Still others used writing samples, portfolios, and running records of the children's center activities such as their abilities to summarize a story.

Summary

Teachers who have adopted a whole-language approach to literacy are justifiably pleased with the progress their students have achieved. They are aware of literacy activities across the curriculum and throughout the day. And they capitalize on opportunities to read and write and make meaning of their environments continuously.

These teachers are concerned with children developing a positive self-concept and confidence in their ability to learn from the beginning. They value children learning to make intelligent decisions and choices and to participate in making their own community rules and government. Their classrooms are deliberately arranged for cooperative work and collaboration throughout the day. Activity centers and literature abound. Almost universally these teachers do thoughtful math, reading, and writing activities early in the morning while the children are fresh. Value is given to children becoming independent readers. Books and their authors and illustrators are held in high esteem.

Children are given multiple opportunities for **daily** writing, and what they write is published and shared. Children learn to work as writers work.

Communication with parents is regular and continuous throughout the school year. Parental support is sought, and parents are shown ways to support what their children are doing in the classroom.

These teachers find that the individual learning differences among their students can be met through both group and center-based activities, where individualization is natural. Whole language teachers find a number of sources for staying current in literacy including reading current professional literature, attending workshops and conferences, and collaborating with their peers. They evaluate their students through standardized tests, grade-level basal tests, teacher-made tests, running records, and portfolios. And they report a high degree of satisfaction in the literacy environments which they have created.

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A PROTOTYPE RESEARCH APPROACH USING ASL AS A PRIMARY RESEARCH LANGUAGE WITH PRINTED ENGLISH AS A SECONDARY LANGUAGE

DAVID MASON

Prometheus steals a sample of fire from the Mount Olympus immortals and passes it on to the mortals; this event coincides with the empowerment of humans at the dawn of civilization.

Researchers in many societies use English as a primary language of research to study various phenomenons qualitatively or quantitatively. A primary research language is a language which is used to document new scholarly studies or review published studies including those on ASL and Deaf culture. Such studies and reports have been interpreted in ASL, as well as rewritten or interpreted in other languages like French and German, as secondary languages. As a general rule, the quality of information or knowledge in any primary research language is qualitatively different from that as rewritten, translated, or interpreted in other secondary languages. The quality normally changes through interpreting or translating processes. This implies that those who read such scientific reports in secondary languages are not as empowered to deal with them as those who have years of experience in reading them in their primary languages. This may explain why ASL-using Deaf people, including those who have good skills with printed English, are rarely empowered as researchers.

This presentation is intended to show that ASL-using Deaf persons can be empowered starting with ASL as a primary language of research which they can translate into printed English (Mason, 1992). The goal is motivated with a belief that, with the utilization of ASL as a primary language of research, more Deaf individuals could learn and develop as principal researchers and become actively involved in various any type of human and natural science research. The uniqueness of their participation is that their "ASL-using Deaf researchers' perspectives" may become an important addition to the overall research community.

The timing for introducing this research approach involving the use of ASL as a primary language of research has to be right, especially with the availability of a particular type of digital video technology. This technology permits Deaf researchers to use of ASL as a primary language of research and allows the same person to translate her/his work in printed English.

This proposed presentation includes a sample prototype qualitative research project that has been in progress at York University, Toronto. A qualitative research method (Bogdan and Biklen, 1992) used in this project is discussed in ASL. ASL is used to collect, analyze, synthesize and discuss interpretations of the qualitative data collected from co-researchers through interview sessions. The entire project is interpreted/translated into printed English on the CD ROM. In this project, the co-researchers discuss what is like being the only Deaf persons in all-hearing environments. The videotaped phases of this research project are digitized and shown in one half of the computer monitor with translations in printed English shown on the other half. The viewers with limited ASL abilities can still read the text and become adequately informed. Those who have considerable ASL and English skills can view and provide critical feedback on translations between these two languages.

In this presentation, this principal researcher also plans to discuss some technical information on how this digital technology could be used to empower ASL-using Deaf persons to participate in the community -- principal researchers. This researcher will suggest that this same technology can be help Deaf children develop their literacy skills through bilingual approaches at school.

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USING ACTION RESEARCH FOR PROGRAM PLANNING

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Introduction

Action research methodology can be used as a tool for self-study and as a way to provide data for CED review. As part of the self-study process for the CED review I conducted an action research project in the 1997-98 academic year looking at the effectiveness of the field experience component of the deaf education program at Fontbonne College. In this paper I will describe the action research project and the results.

The Fontbonne College deaf education program began in 1960 to meet the need for teachers prepared to teach children who were deaf or hard of hearing. Faculty members of St. Joseph Institute for the Deaf worked with Fontbonne College faculty to plan and implement the program. The program was designed with the belief that preservice teachers would learn best by having many opportunities to observe and participate in the classrooms of effective, experienced teachers.

The field experience component of the program consists of four semesters of practicum experience prior to student teaching and a year of student teaching and speech practicum during Senior year. The field experience totals 20 credit hours and over 700 clock hours of experience with children who are deaf or hard of hearing with additional practicum experiences integrated into courses. Sophomores serve as teacher assistants, recreational program teachers or assistant in the dorms with residential students. Juniors participate in weekly observations followed by discussion during the Fall semester and in a tutorial program in classrooms during the Spring semester. During Senior year students have three classroom placements and a speech practicum in which they work with two students daily for approximately seven weeks on the development of

speech and auditory skills.

Fontbonne's program is approved by the Council on the Education of the Deaf (CED). This organization approves programs and certifies professionals in deaf education. CED and the Council for Exceptional Children (CEC) have developed knowledge and skill statements that describe the competencies needed by a beginning teacher of the deaf. I used the skill statements from some sections of this document as a guide in my action research on the field experience component of the deaf education program.

My research was based on the following major questions:

1. What do students learn in the field experience component of the deaf education program?
2. To what extent do the students develop the CEC/CED skill competencies through the field experience program?
3. What are the strengths of the field experience program?
4. How could the field experience program be improved?

Data Collection

The data collection consisted of observations, interviews and questionnaires. Four hours of observation of students engaged in field experience provided data on the activities in which the students were engaged and the possible learning outcomes of these activities. Field notes were written for these observations.

Questionnaires were used to collect data on field experience of students during a one week period to develop a view of the activities and possible learning outcomes for a typical week. The questionnaires were completed by cooperating teachers, supervisors, seniors, juniors and sophomores in the program. The questionnaires focused on activities and outcomes. The senior questionnaire included questions on prior field experiences. The junior questionnaire was in the format of a reflective summary rather than short answer questions. An additional questionnaire

was completed by the cooperating teachers that asked for an overview of the practicum and student teaching experiences of students. The questionnaires also asked for comments and suggestions regarding the field experience program.

A total of forty-six questionnaires were given with thirty-eight returned for a return rate of 83%. Twenty questionnaires were returned by teachers and eighteen were returned by students. The senior and cooperating teacher questionnaires had a return rate of over 90%.

I also interviewed three first year teachers who are graduates of the program. These interviews focused on activities, outcomes, strengths of the individuals being interviewed, and suggestions for improving the program. The interviews were transcribed. The first year teachers also completed a checklist that rated the CEC/CED skill competencies in regard to how well the field experience program provided them opportunities to develop these skills.

I began data analysis by reading through all the questionnaires, fieldnotes and transcriptions of interviews. First, I summarized and listed all comments related to activities and learning outcomes. All comments related to the strengths of the program and all comments suggesting ways to improve the program were also listed. The comments on activities and learning outcomes became the data for answering the first major question: What do students learn in the field experience component of the deaf education program? The comments were coded according to areas of competencies developed in the CEC/CED document and one additional area that I found necessary. These areas are:

- Assessment, Diagnosis, and Evaluation
- Instructional Content and Practice
- Planning and Managing the Teaching and Learning Environment
- Managing Student Behavior and Social Interaction Skills
- Discernment - What It Means To Be a Teacher

I coded some comments as being related to more than one category.

Major Findings

To determine the learning outcomes of the field experience I analyzed the questionnaires, the field notes of my observations and the transcripts from the interviews. These data were coded according to competency areas as described previously.

The students, cooperating teachers and first year teachers made twenty-three comments related to developing skills in assessment, diagnosis and evaluation. Although students were not responsible for formal assessment, they were involved in curriculum-based assessment, grading work, gathering language samples, and using observation to assess student understanding. One teacher stated that she expected a student teacher "to evaluate learning—both content and process—in the students." he students also learned to adapt and modify their instructional practice based on performance data. Many students and teachers commented that a goal of field experience was to help the students develop the ability to listen for speech and language errors that require remediation; a form of ongoing, informal assessment that effective teachers of the deaf must do.

Students and teachers made the most comments (over 250) related to skills described as instructional content and practice. Many comments focused on specialized strategies needed to develop speech, language and audition skills in children who are deaf or hard of hearing. The competency needed to communicate with deaf children was addressed by many respondents. One teacher stated, "[The students] learn to communicate better with deaf children—when [and] how to simplify or extend language." Lesson planning and the use of instructional strategies to meet the needs of the individual learner were also stressed. A first year teacher, a graduate of the program stated that planning had not been difficult in her first year because she had been doing lesson planning since sophomore year. Literacy development, subject content, integrating subject

matter and planning thematic units were addressed. Several respondents also discussed the importance of learning how to evaluate their own performance as a teacher.

The respondents made forty-five comments related to planning and managing the teaching and learning environment. Primarily these comments centered on preparing materials and using instructional media to enhance student learning. A junior stated that she learned "how the children could benefit from the use of the computer" in a reading comprehension task. Comments also focused on using visual information to develop concepts (e.g. semantic webs, speech cards) and being able to use specialized audiological equipment such as hearing aids, cochlear implants and amplification systems. A teacher commented that student teachers would "learn to troubleshoot all amplification devices." Two respondents who participate in a inclusive setting commented on the importance of various settings and the impact of setting on a student's education.

Almost every respondent made at least one comment related to managing student behavior and social interaction skills. Learning how to encourage positive behavior and how to prevent and stop negative behavior was a major concern. One sophomore learned "the challenge of discipline." A student teacher stated, "I learned to read children's emotions and know when to push and when to back off." A cooperating teacher expected the students to learn "developmentally appropriate activities and behavior."

The final area, discernment-what it means to be a teacher, doesn't fit the skill model but is an essential part of field experience. Field experience provides students with experiences needed to decide if a career in deaf education is the right one for them. Thirty-eight comments addressed this aspect of the experience with several comments from sophomores who are in their first placements. Many students and cooperating teachers talked about becoming comfortable interacting and communicating with the children as a first important step. One student stated, "I

try and absorb everything I can from the teachers and students." Another said, "I have truly found what I would like to do for my career." One sophomore listed several things that he learned and then ended his list with, "and I have a lot more to learn."

To determine to what extent the students develop the CEC/CED skill competencies through the field experience component I analyzed the questionnaires, the fieldnotes from my observations, the transcripts of the interviews and the checklists of the first year teachers. As described above, the comments made by the students, teachers and recent graduates of the program reflected experiences that provided opportunities to develop skills in each of the areas. A closer look at each of the sixty skill statements in the CEC/CED document demonstrated that the field experience provided many opportunities to develop some skills and very few opportunities to develop others. I listed the ten skills that received the least mention in the comments of the students and cooperating teachers. Some of these skills are related to tasks that one would not normally expect a student to complete such as collaborating with parents and other professionals involved in the assessment of students with individual learning needs. Although a practicum student or student teacher may observe this collaboration, it is understandable that the student may not be actively involved in this process. Other skills that were not frequently addressed relate to career development and students with multiple disabilities. This may be a function of the practicum site which does not include secondary aged students or students with serious disabilities in addition to deafness.

Strengths of the Program

The strengths of the program were determined by an analysis of the questionnaires and the interviews. The questionnaires did not ask for strengths but the respondents described strengths in the comments and suggestions portion of the questionnaires. The early and ongoing involvement in field experience was described as a strength of the program. Students and

teachers felt that it gave the students the experience they needed to decide if teaching was for them. They also commented that spending three years in field experience gave them the opportunity to develop and refine their skills in many areas of competency. Another strength was the variety of placements that a student experienced throughout the program. One student commented that her variety of placements helped her to learn how to communicate with "little babies" and "teens and pre-teens." The quality of the cooperating teachers was listed as another strength of the program. A recent graduate of the program identified what several of the teachers had taught her through her experience in their classrooms: flexibility, creativity, and resourcefulness. She stated, "Overall I think I've taken a little bit of every teacher I've been with and used that." Another strength of the program is that it provides the students with "real" experiences that allow them to apply the theory and knowledge they're developing in their courses. A beginning teacher said, "The things I learned, I use everyday." A student teacher said, "The practicum and student teaching have helped to pull all the class work and academics together into what teaching is really about."

Ways to Improve the Program

Ways to improve the program came from the questionnaires, interviews and my personal reflections. Some of the suggestions were for adjustments to the scheduling. Some of these suggestions were contradictory; a reminder that it's difficult, if not impossible, to meet everyone's needs in programming. Four suggestions emerged as important and achievable. First, the three beginning teachers all suggested an extended speech practicum to provide additional supervised experience in this crucial area. This change was already initiated and this year the student teachers will complete over thirty-five hours of supervised speech practicum which nearly doubles the previous requirement. The next suggestion is one that came from many respondents. The need for more time to consult, conference, plan and discuss ideas was expressed by both teachers

and students. The reality of a teacher's schedule seems to undermine the accomplishment of this goal. One student stated a concern about a lack of consistency in placements with some teachers expecting too much and some not allowing enough participation by the student. Time for discussion may also strengthen this aspect of the program. Finally, some respondents suggested greater use and easier access to videotaping equipment. Taping the students teaching provides excellent opportunities for analysis and reflection, but because the equipment is difficult to get and set up it is used less than it could be.

Conclusions

The field experience component of the deaf education program at Fontbonne College provides students with many opportunities to learn the skills required to be an effective teacher. These experiences also assist the student in the process of making a decision regarding a career in deaf education. The field experience provides opportunities to develop the skills described in the CEC/CED document with particular strength in the area of instructional content and practice. The area of assessment, diagnosis and evaluation is not addressed as frequently. The strongest aspects of the field experience are the quality of the cooperating teachers and the variety of levels and abilities of the students with which the Fontbonne students interact.

Recommendations

An action research project includes evaluating actions and adapting actions to improve and develop programming. The following recommendations could increase the effectiveness of the field experience program:

1. The Coordinator of the Deaf Education Program should schedule periodic meetings with the teachers and administrators of St. Joseph Institute to explore ways to provide more time for students and cooperating teachers for planning and evaluating the student teacher/practicum students' teaching.

2. The Coordinator should work with the professional development school team to address concerns about expectations for field experience students to develop greater consistency and improved communication between students and cooperating teachers.
3. Ways to provide students with more opportunities to develop skills in assessment, diagnosis and evaluation should also be discussed with teachers.
4. A camcorder should be purchased and stored for easy access to students and cooperating teachers who wish to use this effective tool for analyzing and reflecting on teaching practice.
5. Seniors should complete the competency checklist each year as a data source for formative evaluation of the program. Review data and determine if changes are needed to provide additional experiences to develop those skills which receive low ratings.

THE HOPWOOD CASE: ITS EFFECTS ON UNIVERSITY TEACHER TRAINING PROGRAMS IN DEAFNESS

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Abstract

The school age population of minority-deaf is currently about 43.5 percent; however, only 11 percent of the teachers and administrators are persons of color. A recent Texas case, Hopwood v. The State of Texas, has banned the use of race as a major determinant in colleges and universities in Texas. This ruling along with current backlash against affirmative action policies have hindered college administrators in recruiting minorities in deaf education. A discussion of current trends and affirmative action policies effects is presented. Further, an 8 point strategy for recruitment of minority is proposed.

Introduction

Controversy and confusion has surrounded the recent case, Hopwood v State of Texas. Advocates of this ruling say it champions equal treatment of all citizens. Yet, its opponents see three decades of progress from affirmative action policies being rolled back. This presentation attempts to answer at least two questions: First, "Has there been a change in minority enrollment since Hopwood?" Second, "How do universities recruit people of color into their programs since Hopwood?" It is likely that more questions will arise as it is hoped that a greater discussion and move to action will be developed.

Affirmative action policies have roots back to the 1940s with Franklin D. Roosevelt (Curry, 1996). However, the term affirmative action was not seen until 1961 with John F. Kennedy (Curry, 1996). Supports claim that affirmative action continues to be vital in alleviating discrimination and racism in higher education (Berry, 1996). Further, these supporters claim, the affirmative action policies must remain in place to broadly counteract racism and discrimination.

On the other hand, critics of affirmative action say that racism has been virtually eliminated from most US institutions. One can see African-Americans enjoying a better situation in some ways than before the Civil Rights legislation of the 1960s ending legalized segregation, providing them with access to the ballot box, and providing legal remedies against employment discrimination (Frederickson, 1997). The major legislative victories have afforded the opening of doors for under-represented groups in business and education.

However, truthfully, we would be blind and foolish to deny the fact racism has not been eliminated from our society. Realistically, it is doubtful that racism can ever be completely eradicated as societies "fear factor" is so deeply ingrained in many of us with those who are

different in race, color, creed or sexual orientation. This is why affirmative action policies were set up in the first place to address the past historical wrongs against minorities and provide the a "window" of opportunity to get into colleges and professional schools which provides an effective way to combat racism in our society.

It is true, that universities desire students with high standardized test scores such as the SAT or GRE. However, the Educational Testing Service (ETS), the first creators and marketers of the GRE, claim that the SAT and the GRE only weakly predict course grades during the first year of a graduate program. But most importantly, the GRE did not predict any other indicators in graduate school success such as the ability to think and analyze, be creative, or the capacity to teach and conduct research (Williams, 1997). Yet, these tests are frequently used and heavily weighted in making admissions and scholarship decisions. This policy leaves minorities out as they do not do well on standardized tests.

Why we need diversity in deaf education

As in the general population, the deaf population is becoming increasingly diverse with growing numbers of Hispanics and Asians. Currently, the deaf school age population is 43.5 percent non-white and these numbers, like the national numbers, will increase. See Table 1. Even though numbers of minority deaf children are increasing, we are not hiring enough minority teachers and administrators to meet the needs of these children. In fact, less than 12 percent minorities are found in programs serving deaf children. See Table 2. These figues model those found in regular education and in special education. See Table 3.

Table 1: Minority deaf children in the US (1973-1996)

	1973-74 N=41,070	1983-84 N=52,330	1993-94 N=46,099	1995-96 N=46,000
Total	100%	100%	100%	100%
White	76%	67%	60%	56.5%
Minority	24%	33%	40%	43.5%
Black	16%	18%	17%	17%
Hispanic	7%	11%	16%	18%
Asian/Pacific Islanders	1%	2%	4%	4%
Other	1%	2%	3%	4%

(sources for table 1: Schildroth &Hotto, 1995; Allen, 1997)

Table 2: Deaf, minority, and minority-deaf teachers and administrators

	Teachers		**Administrators**	
N=5235	**N**	**%**	**N=877**	**%**
Deaf	**806**	**15.5**	**114**	**12.9**
Minority	**549**	**10.4**	**103**	**11.7**
Minority-deaf	**66**	**102**	**8**	**.9**

(Source: Andrews & Jordan, 1993)

Table 3: Percentages of minority teachers vs. Minority students in regular education, special education, and deaf education

Type	% minority teachers	%minority students	Difference
Regular Education	13	33	20
Special Education	14	32	18

Deaf Education	**10**	**43.5**	**33.5**

(Source: Wald, 1996).

Clearly, we need more minority teachers and leaders in deaf education. But has the Hopwood ruling and the nation's backlash against affirmative action policies affected minority candidates for deaf education? A telephone survey was conducted with the 9 teacher-training programs for deaf education in the states of Texas, Louisiana, and Mississippi. These states were chosen because they are in the 5th Circuit Court of Appeals jurisdiction (where Hopwood was decided). The directors of these programs were asked the following questions: Are you familiar with Hopwood? What was your minority enrollment prior to Hopwood (prior to 1996)? What is your minority enrollment after Hopwood (after 1996)? Finally, Are you addressing your recruitment efforts differently after Hopwood? The results are found below in Table 4.

Seven universities responded. All programs said they were familiar with the Hopwood case. Overall, we found that of the 494 students enrolled in deaf education teacher-training programs in these three states, only 59 students or 11 percent were members of minority groups. Further, even though 6 of the directors claimed that Hopwood did not decrease their enrollment, the figures for minority candidates are low especially in three states that have a large population of minority citizens. Two programs said that the Hopwood ruling forced them to change their recruitment strategies. These programs now no longer consider race to be a major determinant in admissions to their program.

If we are not preparing minority teachers and administrators to meet the needs of an increasing diverse population of minority-deaf youths, are we not neglecting a resource that could

potentially help us solve the low achievement levels, high drop-out rates, and low employment and unemployment records of deaf persons of color? And, if we cannot or do not promote our own minority-deaf graduates of residential schools for the deaf and public schools, what does this say about the quality of education we are providing them?

Table 4: Telephone survey of Teacher-training programs in Texas, Louisiana, and Mississippi

Questions	University of Texas	Texas Christian University	Stephen F. Austin University	Lamar University	Incarnate Word University	Southern University	University of Southern Miss.
1. Are you familiar with the Hopwood case?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. What was your minority enrollment prior to Hopwood (1996)?	Total stnts 70 ug 32 grad 0 minority	Total stnts 55 ug 4 minority	Total stnts 155 ug 35minority	Total stnts 100ug 30 grad 8 minority	Total stnts 12 ug 6 minority	Total stnts 3 ug 2 grad 3 minority	Total stnts 35 ug 3minority
3. What was your minority enrollment after Hopwood (1997)?	0 minority	2 minority	8 minority	10minority	6 minority	5 minority	6 minority
4. Have you changed your recruiting strategies ?	Yes, we do not target specific ethnic groups	No	No	Yes, we have a stronger recruiting plan	No	No	No

The need for leadership

There is a lack of leadership in deaf education in promoting the needs of minority-deaf children. Even though our professional organizations have shown awareness of minority-deaf issues through position papers and lectures at conferences, we have been timid in developing action plans. Further, deaf organizations, who provide support for their adult members, should begin to use their political powers to influence policies of the largely White establishments which control state education agencies and schools for the deaf. As of yet, no realistic road maps have been developed.

An Action Plan for Teacher Preparation Programs

In light of the Hopwood ruling banning the sole use of race as a selection criterion for admissions, and based on our 10 years of experience working with Mexican-American, Asian-American, African-American, and Deaf students, we present here an eight (8) point action plan to increase minorities in deaf education teacher training programs. Our action plan has resulted in graduating about 35 teachers since 1988 who are Mexican-American, African-American, Asian-American or foreign born (Arab and Chinese who are now employed as teachers of deaf children. See Table 5.

Table 5: Eight-point Action Plan for recruitment of minority and minority-deaf students in teacher training deaf education programs

1. Hire university minority faculty
2. Establish student-faculty mentoring plan
3. Invite guest lecturers from minority backgrounds
4. Establish broad-based Admissions Standards
5. Set up an aggressive recruitment plan
6. Seek Federal funding for scholarships
7. Increase Library holdings on minority issues
8. Offer a course in Multiculturalism and Deafness

This is not a claim that this plan will remedy all of the questions surrounding this complex problem of recruiting and training minority teachers to work with deaf children. In the past decade, our enrollment has been as high as 50 percent and as low as 12 percent. However, the claim is that this 8-point action plan has helped us attract more minority students to our campus and it might work for other universities, too.

The first step was to hire minority faculty and staff in deaf education. Minority faculty members set a tone in a department that diverse views are accepted and respected. Faculty model to students appropriate work relationships with faculty of all races. Minority faculty can also function as mentors for minority graduate students which is the second step. Students having academic difficulties may often feel more comfortable coming to a faculty member who shares their ethnic background and have had similar educational experiences. Over the past decade, we have hired about eight minority faculty and staff as professors, adjuncts, and interpreter training

positions. A third step was to bring in minority and minority-deaf leaders to give lectures to students. This also sends a strong message to the students that the department values the input of minority leaders and that issues they discuss are important. With increased numbers of minority students in classes, issues related to specific minority groups are discussed more often. Non-minority students benefit, too, from these discussions. All students have opportunities to develop friendships with minority students that encourages future collaboration on the job.

A fourth step was to establish a broad based admissions plan. After the Hopwood ruling, race can no longer be used as the sole criterion for program admissions. Our graduate school has developed a formula based on the GRE and the GPA (grade point average) as one criterion for admission. We also look at the candidate's knowledge of minority community, experiences working with minority-deaf children, proficiency in Spanish or other languages, sensitivity towards minority cultures, letters of recommendation from previous employers, or college faculty (or program directors), and having career goals which include working with minority-deaf children.

A fifth step was to begin an aggressive recruitment plan. Having minority faculty has been a built-in recruitment factor as minority students like having minority advisors. It is also important to have regular mail-outs to historically minority universities. Minority students will also recruit by telling their friends about the program.

A sixth step was to apply for Federal funding for scholarships. The Department of Education has scholarship grants to train teachers to work with minority disabled children. Universities, especially Texas, Louisiana and Mississippi where the Hopwood ruling applies, must be cautious not exclude non-minority students in applying for these grants. However, using broad

based admissions policies as described above will insure recruiting minority groups for these grant dollars without excluding non-minority students.

Next, universities are encouraged to increase library holdings on minority deaf issues. Most universities have funds for book acquisitions and look to faculty to make suggestions. Finally, we added to our curriculum a course in Multiculturalism and deafness and require all graduate students to take it. This ensures that all students become familiar with minority-deaf issues. A minority faculty member teaches this course.

Conclusions

There is nothing magical or unique about this 8-point plan. Any university can adopt a similar one. It only takes a commitment and a concentrated effort to face a nagging problem in the field -- to increase the numbers of minority and minority-deaf professionals. This requires regular and consistent efforts to recruit minority students.

However, expectations must be realistic on both sides. Today, many minorities are choosing more lucrative careers in medicine, law and business and foregoing teaching. Yet, this does not let us "off the hook" regarding our own efforts to recruit minority students. Unfortunately, the Hopwood case and its resulting confusion has not helped matters.

Action plans are also needed by state agencies, state residential schools for the deaf and public school programs for deaf children. If we don't recruit and hire more minority teachers and administrators for minority-deaf children, we all lose.

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CONSTRUCTING INCLUSIVE CLASSROOM MODELS THAT SERVE DEAF AND HARD OF HEARING STUDENTS: REPORTS FROM TEACHERS IN THE FIELD

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A major issue in the education of deaf and hard of hearing children and youth continues to be programming. The current placement trend is for the student to be placed in a general education classroom congruent with their grade level and with the provision of supplementary assistance and/or related services. This is known as full inclusion. Depending on the setting and other significant factors, this philosophy can be beneficial or extremely detrimental to the deaf/hard of hearing school population. The question persists, "Does full inclusion meet the needs of a deaf/hard of hearing child?". The answer focuses on the child's language needs, communication mode, the extent and nature of their social/emotional interactions, and the (mis)interpretation of least restrictive environment.

As every teacher in this specialized field knows, language is the key that opens the door to learning for deaf/hard of hearing children. The importance of establishing a solid language base and providing the student access to his/her preferred language or communication mode cannot be overemphasized when considering educational programming. The barriers associated with deafness relate directly to communicative skill, therefore, if the designated setting does not promote language in a manner that is consistent with the child's needs, the child will not achieve to his/her full potential. As teacher educators, we are aware that often perspective teachers observe and work in classrooms where best practice is not modeled. Therefore, our research-in-action questions centered on how inclusive education is defined in research literature and on what inclusive education "looks like" in the public school settings in Kentucky.

Defining inclusion and its essential elements

There is an abundance of literature that defines inclusion and essential components for inclusive education. We focused our attention on the literature and sources that are being used to

"train" inservice teachers in Kentucky. Inclusion is defined as the situation in which students with disabilities are educated together with their nondisabled peers, with special education supports and services provided as needed. (Vaughn, Bos and Schumm, 1997). To construct successful inclusive classrooms and schools, the following factors must be present:

* A supportive attitude toward students and the types of changes, practices, and requirements that their presence will require. All parties include administrators, professionals, paraprofessionals, students, parents and the community.

*Personnel, both professional and paraprofessional, must consider themselves **equal partners** in and out of the inclusive classroom.

*Adequate time for collaborative planning, teaching, and reflecting must be provided to the professionals and paraprofessionals.

* A long term plan at the classroom, school, and district level for how inclusion will be this plan, there should be some recognition that different disabilities will sometimes require unique adaptations. In other words, one size (shape, color, style) does not fit all.

*Finally, successful inclusion requires collaboration and collaborative models.

Collaboration is a style of direct interaction between two equal parties who voluntarily engage in shared decision making as they work toward a common goal (Stainback & Stainback, 1992). This mutual involvement can assume a variety of collaborative models which characterize good inclusive programming. Perusal of the literature revealed several different models for collaborative/inclusive teaching. An examination of Kentucky Department of Education training manuals found that some of these examples received more emphasis than others. The major models identified were:

*<u>**Shadow Teaching:**</u> In shadow teaching, the general educator was the primary teacher

with the responsibility for planning and implementing instruction. The special educator's role was to work directly with one student or a small group of students on target behaviors or academics. In essence, the special educator "shadowed" the regular educator's teaching. This was a model that we found in the Collaboration tapes developed by the State Department of Education.

***One Teach/One Assist:** In this model, the general educator was the primary teacher for the class, and the special educator served as a circulator who offered individual student assistance to ANY student during the lesson.

***Station Teaching:** The role of the special and general educators is to plan and teach different subject matter to subgroups of students who rotate among learning stations. The special educator would be responsible for the subject area(s) that require(s) the most adaptation and support. This model is one which is featured in State Department of Education training tapes and resources.

***Complementary Teaching:** In complementary teaching, the general educator plans and teaches the specific subject matter with the special educator teaching needed associated academic skills to the student(s) with disabilities. This teaching can be done in the regular classroom as well as in a resource/itinerant setting and was also presented in training manuals and tapes by the State Department of Education.

***Supplementary Teaching:** Supplementary teaching is similar to complementary teaching, however, the assistance provided by the special educator is content specific assistance.

***Parallel Teaching:** In parallel teaching, the general educator and special educator divide the class into two smaller groups for more individualized instruction.
The general educator is responsible for content decision/direction and the special educator is responsible for making appropriate adaptations for students with disabilities.

***Team Teaching:** Team teaching reflects the ultimate in collaboration because both general and special educators share EQUAL RESPONSIBILITY FOR PLANNING, CARRYING OUT AND EVALUATING the teaching and learning that occurs in the classroom.

After the research-based definition for inclusion was ascertained and a review of teaching models for effective inclusive education was completed, we proceeded to determine which models were being used most in programs serving deaf and hard of hearing students. We decided that the

best description of current practice in Kentucky could only be provided by the teachers presently working in classroom environments.

Describing collaborative classrooms and practices in Kentucky

An open-ended response questionnaire was developed and sent (along with a blank videotape) to teachers of deaf and hard of hearing students. These educators were asked to brainstorm the questions and then videotape their responses. They were encouraged to think of ways to demonstrate and explain how/why their program functioned in such a manner. The questionnaire asked the following:

Questions

1. Describe the model of collaboration that is currently being used in yourdistrict with deaf and hard of hearing students. Does this model change with age/academic level of students being served?

2. If someone were to ask you to write a job description for your present role as a collaboration teacher for deaf and hard of hearing students, what are some important, key responsibilities that you would note? What are some important, key qualities that you feel you must have in order to work effectively in your present position?

3. Describe the collaboration strategies that you currently use with other special education and/or regular education teachers? Be as specific as possible in your narrative.

4. Describe the kinds of collaborative teaching that you do in your current position.

5. If you were offered the opportunity to redefine collaborative teaching with deaf and hard of hearing students, what changes would you make and what would you keep the same?

Videotapes were returned and analyzed. In viewing the videotapes we wanted to

determine a) how teachers define inclusion/collaboration, b) what elements are emphasized as essential to successfully serve deaf and hard of hearing students, c) what factors might be unique to those students, and d) which inclusion/collaboration models appear to be most effective.

Essential components in inclusive programs for deaf/hard of hearing students

In the videotapes, teachers described inclusion/collaboration as a process in which special and general educators work together to serve deaf and hard of hearing students. In analyzing the teachers' elicited responses to Questions #2 and #5, essential components of successful inclusive programming were identified. It was interesting to note that many of the essential components previously examined in the literature were targeted in the responses from the practicing teachers. They proposed the following essential components:

*Positive, respectful, supportive attitudes from all parties are needed to effectively plan and implement successful inclusive programming.

*All personnel, including administrators, teachers, paraprofessionals, support professionals (speech pathologists, interpreters, notetakers), and parents, need to see themselves as **equal partners** in the educational process, both in and out of the classroom.

*One of the most critical components identified was the need for collaborative planning with all professionals and paraprofessionals involved in serving the child. Time limitations were frequently mentioned by teachers as a barrier to accomplishing this objective.

*An understanding of the unique needs of deaf and hard of hearing students including room acoustic considerations, assistive and adaptive technology and the use of interpreters (oral and sign) was an expressed concern. This understanding can only be developed through inservice training and experience interacting with deaf and hard of hearing students.

*Another important component to the success of inclusive programming was the flexible

attitude and willingness of general educators to learn new skills especially in the areas of sign language and assistive devices.

*A long term plan to implement inclusion was deemed as necessary from the teachers' perspective. Programs that considered themselves successful were school districts that had established a means of easily transitioning students from year to year and level to level (elementary, middle, high school).

*In every response, teachers spoke to the need for a full continuum of service options, allowing them to freely move students back and forth between inclusive settings and to resource room settings when appropriate.

*The opportunity to be with other deaf and hard of hearing students as well as deaf and hard of hearing adults was also considered an essential component to the success of inclusive programs.

*And, finally, an essential component that was stated as a consequence of inclusive programming, is the continued high expectation for social behavior and academic achievement of deaf and hard of hearing students.

Inclusive and collaborative models used with deaf and hard of hearing students

In Questions #1, #3, and #5, we asked teachers to talk about the inclusive models and strategies that were being used in their schools. Taking their lengthy descriptions of programs and strategies, we found that the following collaboration/inclusive teaching models were being used with deaf and hard of hearing students across Kentucky:

*One teach/one assist

*Shadow teaching

*Station teaching

*Complementary teaching

* Parallel teaching

* Team teaching

The models most frequently mentioned were One teach/One assist, Shadow teaching, and Complementary teaching. However, the one program which seemed to meet all of the essential elements for successful inclusion cited team teaching as the most frequently used model for inclusion/collaboration. Regardless of the model used, teachers stressed the importance of all professionals and paraprofessionals viewing themselves as **equal partners** in the planning and implementation of instruction.

Of the statewide programs that participated in the survey, one particular district seemed to completely embody the essential elements for successful inclusion of deaf and hard of hearing students. This district is located in a rural area of Kentucky, yet, they have developed a long term commitment to meeting the **unique** needs of their deaf and hard of hearing students. An important factor that contributed to this success involved transporting the students to one central location. Students were then able to meet and interact with others who also used sign language or wore amplification devices.

Another significant factor that relates to all programming in the Commonwealth is that under the Kentucky Education Reform Act the idea of multi-age, multi-level ungraded primary classrooms with "family grouping" (meaning that students may stay with a teaching team for two or three years) is considered to be a desired practice. In addition until 1997, teaching deaf and hard of hearing students in Kentucky required dual certification. What resulted was that this elementary school created an environment of team teaching--some staffed by two teachers of the deaf--one acting as the regular educator, the other as the teacher of the deaf and hard of hearing. Because the deaf and hard of hearing students have been in inclusive classrooms which were multi-age, multi-level family groups, their hearing peers have had long term exposure to sign language and have established lasting relationships/friendships with the deaf and hard of hearing students. What began as a classroom experiment has evolved into a unprecedented model of

educational programming for deaf and hard of hearing students.

While the primary classrooms function as teams, administrators have demonstrated a willingness to provide "a full continuum of services" for these students. They have allocated space in their buildings for individual and small group work when the teacher of the deaf and hard of hearing feels it is necessary to pre- or re-teach concepts and skills presented in the "team" classroom. Because both administrators and teachers in this district have seen a marked improvement in student progress, they adhere to this framework of programming and continue to seek ways to enhance the educational process for their deaf and hard of hearing students.

Implications for teacher educators

As teacher educators we now have a better understanding of the essential elements and qualities that are necessary to establish a successful inclusive setting. We will incorporate those concepts into our teacher training program. Preservice teachers need:

*to understand the different models that support collaborative and inclusive teaching and recognize when, why and how they can be used in inclusive classrooms and settings,

*to consider how the unique needs of deaf and hard of hearing students can be **shared** and met in public school settings,

*to acknowledge the importance of services provided by paraprofessionals and the impact which these services can have on student success or failure, and

*to develop interpersonal skills that will allow them work effectively (and cheerfully) with other professionals and paraprofessionals.

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INCLUDING COMPETENCIES FOR ITINERANTS AND RESOURCE ROOM: TEACHERS IN PREPARATION

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Deaf education, in its typical state of turmoil, has hit yet another snag. Many of us have watched with great concern the ways in which Least Restrictive Environment (LRE) is being interpreted and implemented. When LRE began to be defined as inclusion in the regular classroom, we thought--hoped--that they couldn't possibly mean deaf students. Some of us had had experience with deaf students in integrated settings, and liked some of what we saw. But we also were concerned that our students be educated in large enough populations so that communication and social growth would be possible. We had watched the progress of many of our deaf students in integrated settings and realized how limiting that environment could be as an educational experience for a number of deaf children. But we began to read statements like the following:

> Ethical considerations of equity and individual rights justify removing students from categorical programs...Not doing so may deny them access to quality education...Being transported to a different school on a special education bus is a clear indication that one doesn't measure up to expectations...As long as these avenues exist to exclude students that do not fit...the resources necessary to facilitate more significant program adaptations are drained from the school into the specialized programs. (Bradley, King-Sears & Tessier-Switlick, 1997, p.8)

We realized that our sense of the purpose and value of special education was considerably different from the views of many others. As Ramsey (1997) pointed out in her excellent study of deaf children in a resource room, regular educators seemed to assert that equality of educational opportunity was the deaf children's dominant need (p. 44). In contrast the resource room teachers saw the purposes of their work as:

> helping deaf children to develop and to learn by trying to devise ways to teach them

to read, write, and spell English, by providing an intelligible setting for interaction so that the children could gain competence in ASL, and by helping them learn about the world, including the lives of Deaf people. (p. 52)

Many of us find we are sending a large portion of our graduates to work as resource room and itinerant teachers, sending them into environments in which there is considerable potential for a collision of values and educational goals. The high number of these teaching positions was brought home to us when we met with the staff of the regional program for the deaf here in the Portland area. Of the sixty teachers of the deaf and hard of hearing present, only fifteen could be considered to be teaching in self-contained classrooms. Gradually we have begun modifying our curriculum and our practicum experiences to accommodate this change. It is important to us that these educational settings not be failures for deaf students. Our graduates need the competencies to work in these complex situations where the values and goals they encounter may not at all match those they developed for themselves in our teacher preparation program.

As we have taken on the process of curriculum modification we have tried to look at what resources we have to bring to this challenge. We think our first resource is optimism. It would be easy to look at a situation like Ramsey described (and we have seen plenty like this) and feel that this is simply hopeless. The philosophical divide between regular education and deaf education just seems to be too wide. But we have decided to take a different tack. We have seen resource room teachers and regular teachers who have found ways to work together to develop programs that meet many of the educational needs of deaf children. Some of these programs are really quite exciting. They are energizing for the regular teacher, for the teacher of the deaf and for all the children, deaf and hearing. These teachers struggled through their different visions, pedagogies, and goals, and found common ground. They developed true constructed relationships, working together to strengthen the educational experience beyond what each teacher could do separately.

Our second resource is within our own programs. We now directly coordinate the program in

Special Education: Early Intervention/Early Childhood. This program is an extension of the personnel preparation program developed at Infant Hearing Resource (IHR). Many of the individuals who taught courses with IHR continued to teach the early intervention courses when the program moved to Lewis and Clark College. Most of the faculty had been employed at Infant Hearing Resource at one time or another. Through experimentation, writing, involvement with other early intervention programs, reading, discussions with parents, and through considerable introspection, IHR established a number of parameters which carried over into the current program. Among those parameters are a high priority on teamwork and an honoring of the parents as the primary educators of their children and as equal partners on the educational teams. We realized that the skills that go into being an effective team member in early intervention are needed by those who become itinerant or resource room teachers. We know that going solo in integrated school settings can only end up isolating the deaf child and fragmenting the child's educational experience.

Another resource we have within our own college is the Core program of the Graduate School of Professional Studies. The faculty of the Graduate School developed the Core to help its students, all of whom are moving into public service professions, to use the resources of the liberal arts to better deal with the stresses and strains of the professional life. The Core includes topics such as the interaction between adult development and the professional life, working in organizations, the impacts of race and gender on professional practice, life passages and transitions, and ethics and the public service professional. The pedagogy in these courses is based on constructed knowledge--the belief that each person brings something to the learning situation which shapes what we are all learning together. The instructors consider themselves to be learners as well as teachers. Team work is a part of nearly every class so teamwork skills are consciously taught. Team teaching is a valued element of the Core.

Both of us in the deaf education program participated in the development of the Core and have

taught a variety of courses in the program. This has given us a chance to learn about whole areas that were new to us, areas such as adult development, the interaction of the personal and professional life, formal problem solving and conflict resolution, organizational change, constructed knowledge and working in teams. Both of us began to incorporate elements of the Core into our classes. As we began talking about the needs of our graduates we realized that skills we had learned through the Core program would be particularly valuable for those who were going into itinerant and resource room roles.

The third resource, which we greatly value, is our colleagues--the practitioners, deaf adults and the parents. As we more deliberately set about identifying competencies for the itinerant and the resource room teacher, we realized that we needed extensive consultation from deaf educators, the parents of deaf children and deaf individuals who had been the recipient of our educational services. Through the assistance of a grant from Wade Newbigan, a parent who had been connected with Infant Hearing Resource, we are able to engage a number of these individuals in the curriculum revision project.

The project has two parts. The first is the development of the competencies our graduates need for working in the complex world of the resource room/itinerant teacher. Those competencies will be clustered in modules which will be taught throughout the program. Students from both the Early Intervention and the Kindergarten through Twelfth Grade Programs will take some of these modules together. A few of these modules have in fact already been developed and taught for the first time this year. The second part of the project is the development of an itinerant/resource room teacher handbook. We thought producing a handbook was particularly important because there are so many currently practicing itinerant and resource room teachers who are struggling with how to make the education for their students be more successful.

What we are introducing at the conference is an outline of the handbook in its current state.

The committees with whom we have been working have made some suggestions for changes and additions, but those are not included here. Each section of the handbook will contain information for the itinerant teacher and handouts for parents and for the regular classroom teacher. Once our work is completed we will then make it available to our colleagues. What we hope to gain from this conference is input from our colleagues concerning other areas we should be giving consideration to in the handbook and suggestions for methods of distribution.

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Ramsey, C. L. (1997). *Deaf children in public schools: Placement, context, and consequences.* Washington, D. C.: Gallaudet.

THE ITINERANT/RESOURCE ROOM TEACHERS HANDBOOK*

A. Speech

Background information for Teacher of Deaf

1. IPA
2. Speech banana
3. Description of formants
   --how made
   --implications
4. Diagnostic tests
   --Ling
   --others
   --receptive speech
5. Common methods
   --auditory training
   --traditional speech correction--major methods
6. Speechreading
   --classification of visual phonemes
   --traditional methods
   --evaluation systems
   --cued speech
7. Hearing aids
   --types of aids
   --reading audiograms
   --care of hearing aids
   --assisted listening devices
8. Cochlear implants
   --parts of implants
   --how they work
   --care for implant
   --controversy
   --role of specialist
6. Resources

Information for classroom teacher (handouts)

1. What the child can hear, speechread
2. How to set up the classroom for the deaf child
3. Hearing aid management
4. Use of auditory trainer
5. Cochlear implant management
6. Role of itinerant teacher, speech and hearing specialist

7. What is an audiogram

Information for parents

1. What the child can hear, speechread, produce
2. What to expect in the regular classroom
3. Role of the itinerant, speech and language specialist
4. Common methods used for instruction
5. IFSP and IEP goals
6. Resources
7. Cued Speech
8. The auditory trainer
9. Considering the cochlear implant
10. Childs acceptance, rejection of hearing aid

B. Sign language systems

Information for itinerant teacher.

1. Definitions and descriptions: American Sign Language, English Sign Systems; Rochester method, Cued Speech
2. Determining method to use
3. Grammatical aspects of ASL
4. Language development: ASL
5. Methods for improving children's usage of ASL
6. Evaluation of acquisition of ASL
7. Resources

Information for classroom teacher

1. Description of different sign language systems (each on a separate page)
2. Effects of using systems in regular classroom
3. Effects of systems on learning English
4. Hearing children and sign language in the classroom

Information for parents

1. Description of sign language systems
2. Selecting a communication system for your child
3. Signing and family life
4. IFSP and IEP goals
5. Your signing child in the hearing classroom
6. Things you can do at home
7. Improving your own communication skills

C. English language development

Information for itinerant teacher

Methodology: oral/aural, English sign systems; English as a second language
Steps in development
Assessment
Methods of instruction

Information for classroom teacher

Methodology: Oral/aural, English sign systems, English as a second language
How English grammar expressed
The impact of deafness on the acquisition of concepts
The impact of deafness on the acquisition of English: what it means in your classroom
Strategies for assisting student in development of English
Working with the itinerant teacher; speech and language specialist

Information for parents

Normal stages of development of English
Impact of deafness on acquisition of English
What you can do to help your child acquire a first language
- interaction strategies
- conceptual development
- devices which use English: TTY and captioned television
- IEP and IFSP goals

What the itinerant, the speech and language specialist and the classroom teacher will do

D. Development of literacy

Information for itinerant teacher

Adaptation of literacy methods to deaf students
English literacy as a first language and as a second language
Assisting regular classroom teacher understand issues of literacy
Suggestions for regular classroom teacher
Assisting the deaf student in reading and writing

Information for classroom teacher

Affects of deafness on development of literacy
Strategies to assist deaf student acquire literacy

Information for parents

Challenges for deaf students in acquiring literacy
What you can do at home to promote literacy

E. Professionals in the classroom
Information for the itinerant

The interpreter
- roles of interpreter
- challenges for the interpreter
- preparing the interpreter to work in the regular classroom
- role of the interpreter/aide
- preparing the students to use an interpreter
- preparing the classroom teacher for the interpreter
- parents and the interpreter
- appropriate interactions between interpreter and student (ex. always interpret; role is not to tutor; is teachers responsibility to make sure the child is learning--not itinerant)

The speech and language specialist
- communicating with the specialist (ex. needs of deaf child)
- determining role of specialist

The classroom aide
- determining duties and responsibilities of the aide
- preparing the classroom teacher for the aide

Information for the classroom teacher

Information for the parent

What is an interpreter
Communicating with the classroom teacher about the interpreter
What you need to know (rights, roles, who communicate with) and problems which can occur (interpreter not communicating language child uses; interpreter not doing proper things in classroom; interpreter developing inappropriate relationship with child)
What is an interpreter/aide and aide
- responsibilities
- communicating with the aide
- what to do if you have concerns

F. Working in teams

Information for itinerant teacher

The adult as learner
Running good meetings
Establishing effective interactions

- Communication strategies
- Strategies for collaboration
- .Formal meetings vs. informal meetings
- Consultation skills
- Communication strategies
- Problem solving strategies
- Conflict resolution
- Record keeping

Information for classroom teacher

Role of teams in deaf education
Your role in the deaf education team
How to be heard
Participation in IFSP/IEP

Information for parent

Teams and deaf education
Your role in the deaf education team
How to be heard
Participation in IFSP/IEP

G. IEP/IFSP

Information for itinerant teacher
Description of IFSP/IEP
Description of roles of all members of IEP/IFSP teams
IEP/IFSP requirements
Assessment
Developing goals and objectives
Responsibilities of specialist
Due process
Timelines

Information for classroom teacher
Description of IFSP/IEP
Your role in the IFSP/IEP process
Requirements of classroom teacher

Information for parent

Description of IFSP/IEP
Your rights and responsibilities

Due process
What you can expect before, during and after an IFSP/IEP meeting
How to be heard

H. Social Development

Information for itinerant

Issues
- manners
- effect of language acquisition
- effect of communication barriers

The deaf culture
- Strategies for enhancing social development in the regular classroom
- role of teacher
- role of interpreter
- role of aide
- itinerant participation in the classroom
- educating hearing students about deafness
- bringing in deaf adults
- teaching rules of games, other informal activities

Developing self-esteem and self-advocacy
Manners
The middle school and high school student

Information for classroom teacher

Effects of communication barriers on the development of social skills
- Strategies you can use to enhance development of social skills
- Helping hearing students adapt to deaf students
- The deaf culture and social development
- Improving your own communication skills
- Self esteem and the deaf student

Information for the parents
- Effects of deafness on social development
- Strategies you can use to enhance social development
- Role of the deaf culture
- Your deaf child and the hearing world
- Helping your child develop independence

I. Behavior management

Information for the itinerant teacher
- Common behavior problems in the regular classroom

- Assistance you can give to the regular classroom teacher
- Strategies you can suggest to parents

Information for the classroom teacher
- Common behavior problems of the deaf child
- Strategies for improving the behavior of the deaf child
- Using team members for behavior management
- Information for the parent
- Common behavior problems and their management
- Using the team for improvement of behavior
- Behavior at home versus behavior at school

J. Roles of the itinerant teacher

Information for the itinerant teacher
- Having no home base: consequences for interaction and problem solving
- Time management; scheduling, flexibility
- Role clarification
- Organizational skills
- Data management
- Stress management
- Understanding organizations
- Establishing credibility
- Coordinating services

- Meeting your own emotional needs
  - burnout
  - your own adult development
  - interaction of adult life and family life

1. What you do when you meet with the child
2. Keeping up with the regular curriculum
3. Ethical considerations
   - confidentiality
   - conflicts of loyalty
   - conflicts with district on goals and policies
   - dealing with difficult individuals

Information for classroom teacher
1. What the itinerant teacher does; what she can do for you; what her limitations are

Information for parents
What is an itinerant teacher?
What are the implications for your childs education?

What can the itinerant do, not do?

K. Transitioning

Information for itinerant teacher

Legal requirements
Supports needed for student, parents, placements transitioning from and to
The transition meeting

Information for the classroom teacher

Transitioning the deaf student--legal requirements; social support
The transition meeting: what you can provide and what will happen in the meeting
your role

Information for the parents

Transitioning your child from one placement to another--legal and social consequences
The transition meeting
Legal requirements
Your role
Getting what your child needs out of the transition meeting

*The order in which the material will be presented has not yet been determined.

PROBLEM-SOLVING and DEAF COLLEGE STUDENTS: Issues and Strategies

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In Lang's (1996) historical perspective on bridging teaching and research, he cites the words of a young deaf teacher, Laura C. Sheridan, who presented "Thoughts from My School-Room" to the Eleventh Convention of the American Instructors of the Deaf in Berkeley, California, July 15-22, 1886 (Sheridan, 1887). Sheridan's plea to the convention members was to focus on the real difficulties of the school-room and noted "...that aspiring teachers have felt a disappointment after attending a convention at hearing so little plain talk upon the practical questions that have knotted and snarled their school-room work." Lang used Sheridan's plea from 1886 calling for more "plain talk" at conventions for teachers of deaf students to emphasize that we still have a considerable way to go. He went on to state that "many conference papers today are formal presentations that often stop short of drawing implications for the classroom teacher...." (Lang, 1996, p. 279).

Action research is a viable classroom oriented approach for educational research to address teachers' concerns and the "practical questions that have knotted and snarled their school-room work." As defined by Oja and Smulyan (1989):

> Action research projects have three general aims: staff development, improved school practice and the modification and elaboration of theories of teaching and learning.....Improved practice results from practitioner participation in the investigation of actions issues of immediate importance. (p. 1)

This teaching research effort on problem-solving issues and strategies pertinent to deaf college students reported herein is focused on improved practice and represents the collaborative contributions of a college math teacher and an educational researcher at the National Technical Institute for the Deaf (NTID), one of the eight colleges at the Rochester Institute of Technology in Rochester, New York. Feldman's (1996) definition of action research also provides a descriptive framework to understand this NTID teaching research effort. Feldman's two part description of action research includes a problem-solving process whereby teachers focus on a problem and ask questions about it; then, a plan is developed to collect more information about the problem, draw conclusions, and potentially solve the problem.

Deaf students from the elementary grades to university level persist in having difficulty with problem-solving activities. The need to address the problem-solving and critical thinking skills of deaf students throughout the curriculum has long been emphasized by a number of educators and researchers in the field of deaf education (Furth, 1966; Luckner, 1992; Luckner & McNeill, 1994; Martin, 1984, 1993; Mousley, 1991; and Rohr-Redding, 1985). While some of the problem-solving difficulties of deaf students are similarly experienced by hearing students, the diversity of problem solving experiences, skills, and related knowledge of deaf students (even at the college level) makes it difficult for teachers to take a unified approach to presenting and teaching content that involves problem-solving. Furthermore, such a situation complicates teachers' efforts to apply instructional recommendations from the research literature, because they often do not seem to fit or work with the diverse students in a real classroom.

A number of issues and strategies pertinent to problem-solving were examined in a series of studies with deaf college students who were majoring in the College of NTID and enrolled in undergraduate math courses (from Foundations of Algebra up to Concepts of Calculus) taught by one of the authors at the National Technical Institute for the Deaf at the Rochester Institute of

Technology in Rochester, New York. The goal was to identify relevant issues and viable instructional learning strategies to improve problem-solving for the deaf students enrolled in these college math courses. All of the students enrolled in any given class in which a specific problem-solving issue or strategy was being examined were included in the study. Cumulatively, a total of 57 NTID students participated in the four studies reported here.

The initial issue of interest was how deaf students' reading ability and language might affect their understanding of a problem situation and their subsequent explanation and solution of the problem. This study involved the use of another classmate as an observer. The student solving the problem was required to explain in sign language the goal and rules of the problem to the student observer prior to starting the problem and then explain their strategy for solving the problem at the end. Subsequently, the students were also asked to write down the goal, rules, and strategy they used for solving each problem. Two problems were presented to each student to solve individually and explain to an observer: 1) The Tower of Hanoi, a manipulative game puzzle; and 2) a math word problem. Ten students participated.

With regard to the students' primary language issue (i.e., whether they primarily used ASL or signed English), no differences were observed in either their patterns of performance for solving the different problems or in their explanations. However, the data analysis showed that reading levels of the students were significantly associated with their ability to clearly articulate in writing their strategies for solving the Tower of Hanoi. When it came to writing the strategies used for moving the disks to solve the puzzle, the five students who had assessed reading scores in the range between 10.3 to 11.1 grade levels did significantly better in articulating their strategies (mean = 1.8) as compared to the five students with reading scores between 6.9 and 9.7 grade levels (mean= .8). Reading ability also was significantly associated with the students' clarity of explanation for demonstrating understanding of the problems. For both the math word problem and Tower of

Hanoi, students with higher reading levels (10.3-11.1) scored significantly better on their written explanations than students with lower reading levels (6.9-9.7). However, when it came to the signed explanation for the Tower of Hanoi (a visual/manipulative puzzle), the students in the lower reading level range almost doubled their score (mean= 63) as compared to their own written explanation (mean= 33.4) for the same problem. Interestingly, this pattern did not occur with the math word problem in which the students in the lower reading range performed about equally with both their signed explanation (mean= 58) and their written explanation (mean= 52). In contrast, the students in the higher reading level range scored consistently higher in both of their explanations for the math word problem (written mean = 72 compared to signed mean = 78). Upon reflection, these results seem understandable in that the students with the higher reading abilities would logically better comprehend and be more comfortable with the language of the math word problem and thus, would be able to more clearly explain in either sign language and written form their understanding and solution to the problem. In contrast, the students with the lower reading abilities had to start with the language of the math word problem -- even though it was also introduced to them in sign language by the teacher, they had to rely on the printed copy as they solved it, which apparently affected their understanding and explanation of the problem in both sign language and in written form. However, the visual/manipulative Tower of Hanoi did not depend primarily on language, except for the rules which were presented in both sign language and written form, and the students could develop a visual understanding of the disc moves to solve the puzzle. Here again, the lower reading ability students had difficulty with their written explanation of the problem goal and rules, but their signed explanation was equal to the students with the higher assessed reading abilities.

Another issue and strategy involved visualizing the problem-solving process prior to actually trying to solve the problem and involved only the Tower of Hanoi puzzle. Based on the subjects' performance in the first study, it was decided to introduce a visualization strategy to see if it would

affect the students' performance with regard to number of moves to goal solution. For example, during the initial part of this study, while a number of students could clearly recite the rules and goal solution of the Hanoi Tower, such recitation did not necessarily translate directly into thoughtful strategies while moving the disks. Often, a number of subjects seemed to overly fixate on the rules and appeared pressured by the time and speed considerations while moving each of the disks from tower to tower without having a thoughtful plan or strategy to methodically use the rules to successfully arrive at the goal solution with the fewest number of moves possible and as quickly as possible.

The 16 students participating in this second stage of the study were randomly assigned to one of two conditions: 1) the visualization strategy group of individual subjects was given the instructions and then asked to study the Hanoi Tower and visualize their moves without touching the disks or tower for at least two minutes and up to three minutes maximum prior to beginning their first move; and 2) the non-visualization group of individual subjects was given the instructions and then allowed to proceed immediately with solving the Hanoi Tower. Similar to the initial study, as part of the instructions each student was given the opportunity to clarify the rules and goals with the instructor, and show understanding by restating them in both sign language and written form. The intent of the visualization strategy was to force the subject to think about their moves in relation to the rules and to visualize the results of their moves prior to actually making any move. With thoughtful visualizing, it was hoped that students would be able to perform more efficiently with a goal-oriented movement strategy to successfully arrive at the goal, and not be pressured into fixating on either speed or the rule for placing only smaller disks on larger disks. Again, consistent with the debriefing protocol used in other stages of this study, when each subject completed the solution to the Hanoi Tower, the experimenter asked them to explain what strategies they used to solve the problem.

The resulting performance data showed that the visualization group made significantly fewer moves to solution (mean = 19.92) as compared to the non-visualization control group (mean = 35.1). There was a similar trend for the time it took to reach solution, but it was statistically non-significant: visualization group mean = 1.3 minutes; and non-visualization group mean = 2.3 minutes.

A third study examined the efficacy of the strategy of having the teacher model the problem-solving process. Twenty students participated in this study. The teacher provided a detailed, step-by-step model of the analytical process for a sample math word problem in a one-hour session to a group of 10 students (randomly assigned). The instructor solved one example math word problem by walking them through the problem step-by-step and identifying, calculating, and considering all relevant information presented in the problem and explaining the answer in the context of the problem, followed by questions and discussion. The instructor "vocalized" his thinking outloud by signing and speaking his thoughts as he analyzed, solved, and explained the problem. The instructor did not hold back any information and took the time to include all relevant details of the analytical modeling process.

Three math word problems were then administered in class to the 10 students who had participated in the training session, as well as to 10 students who had not participated. The students then independently solved each problem in writing. No discussion among the students was allowed, nor was there a debriefing session when they completed each problem.

The results of this instructional strategy demonstrated that teacher modeling in detail of the complete problem-solving process (i.e., identifying and considering all available information, calculating, and explaining the answer) influenced the students' performance on subsequent similar math word problems. This strategy significantly increased the number of students in the training group as compared to the control group for analyzing all available information presented in the math

word problems and for more fully explaining the reasons for their answers.

Another study in this series examined the application and transfer of information learned. Eleven students participated. In the previous stages of this series of studies, there was a recurring sense, as well as evidence in performance that many of the students did not apply the knowledge and information that they either expressed (in sign language and/or writing) or learned in a training session when trying to solve subsequent problems. Thus, this study focused on the application of information learned in a teaching session to the students' performance with math problems that required the use of this information. The problems the 11 students were given to solve after experiencing the instructional session and demonstrating on a test that they had learned the information included: 1) the same of type problems; and 2) problems that required the students to extend and apply the information learned to dimensions of the problem that were not included in the teacher's instructional session. Also examined was whether performance of the students was affected by the presentation of the math problems in word format or in graphic format similar to the problems presented in the instructional setting and the initial test

After an instructional session, students were able to demonstrate that they had learned the math skill of finding the area of a square through squaring (multiplying side x side) when given a criterion test using graphically presented square figures as test items similar to the examples used in the instruction (but with different numerical values and symbolic representations). However, their performance on calculating the area of a figure decreased with further testing in which the test items extended beyond the specific content and examples of square figures that were covered in the instructional session. These additional test items included a mix of finding the area of graphically presented squares, rectangles, and the volumes of three dimensional figures such as square and rectangular cubes; all of which could be solved with the similar skill for finding the area of a square -- i.e., multiplying the sides (i.e., length x width, or length x width x height) to find the area or

volume. For whatever reason (e.g., perhaps it was due to impulsive behavior), the students had difficulty in seeing this similarity in calculation and extending or applying it to the figures other than squares. The following table presents the mean test scores for the

Graphic Presentation of			Word Problem Presentation of
Cr. test of Squares	Squares & rectangles	Cubes & rectangular cubes	Squares, rectangles & cubes
94.6	82.7	59.1	52.8

Another interesting result was that when further testing for finding the area of squares, rectangles, and three dimensional figures was presented in written format (i.e., as a math word problem) as opposed to a graphically presented format, the students' performance decreased even further. These findings, however, cannot be interpreted only in the context of a transfer issue. Another contributing variable appears to be the continuing difficulty deaf students have, even into the college level, in dealing with the written English of math problems.

Application of learned knowledge and skills to subsequent problems is a critically important to problem-solving. This includes the application of learned information and skills to both the identical kind of problem, as well as the extension and transfer of what was learned to similar, but different dimensions of the problem.

Recommendations

Based on the results of this study, the following teaching/learning strategies are recommended as part of the problem solving activities with deaf students:

- for teachers, when modeling the procedures of problem-solving to students, include every possible step with detailed explanation in sign language, spoken, and written form. In turn, students should be required to do the same and model their problem-solving procedures with explanation to either the teacher or their peers
- either prior to, or as part of solving a problem, involve the students in an interactive/feedback situation (paired with another student, aide, or teacher) where the student is required to explain the problem and answer questions
- have students think about, explain, analyze and summarize problem-solving tasks with sign language, verbalization, and written text
- have students conceptualize (or visualize) their problem-solving strategies prior to solving the actual problem
- whenever possible, present problems in both graphic and word format
- assess students problem-solving abilities with a variety of strategies that include sign language expression, written expression, and demonstration rather than relying on only a traditional approach of a paper test where a student's lower reading level could adversely influence understanding and explanation

These recommendations will provide needed analytical practice with problems and help the students develop greater flexibility with regard to problem-solving. Furthermore, teachers need to realize that even though a student can give what appears to be a clear explanation (e.g., written, signed, or vocalized) of a problem situation and the related relevant information, rules, etc., it does not mean that they can use this information to successfully solve the problem. Also, one needs to understand

that reading levels of students influences their ability to explain strategies and solutions, particulary with respect to problems presented in word format.

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Co-TEACHING DEAF AND HARD OF HEARING STUDENTS:

Research on Social Integration

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Introduction

There is another alternative to the public school placement of deaf students to segregated classes, resource rooms, or inclusion as isolated individuals in a mainstream class. Deaf students can be kept as in-tact groups sharing a deaf peer group while at the same time being exposed to the social contact and academic pressure of a mainstream class. The alternative which has been tried in several locations is team teaching or co-teaching (Kluwin & Gonsher, 1994).

In these situations, small classes consisting of about 20 students are created. 5 or 6 deaf students are combined in a classroom with 15 hearing students. The class is taught jointly by a teacher of the deaf and a regular education teacher. A third adult is generally present in the classroom, that is, an aide/interpreter or an interpreter. Curriculum pace is set by the overall progress of the class. Additional communication access to the material is provided by the teacher of the deaf signing during her presentations, by the aide or interpreter as needed, and sometimes by the regular education teacher who often begins to learn signs. Signs are taught to the hearing students both formally and informally. In addition a variety of unique solutions are derived locally to solve communication problems in the classroom (Kluwin & Gonsher, 1994).

Two problems confront us in the expanding movement of deaf and hard of hearing

children into local public school programs.

1. Deaf and hard of hearing children reportedly have little if any interaction with hearing peers in local school programs. Consequently, deaf and hard of hearing children often report a sense of loneliness and isolation later in life (Gaustad & Kluwin , 1992).

2.While there is some process information about co-teaching, there is no substantial research study of the process of co-teaching nor its long term outcomes (Kluwin & Gonsher, 1994).

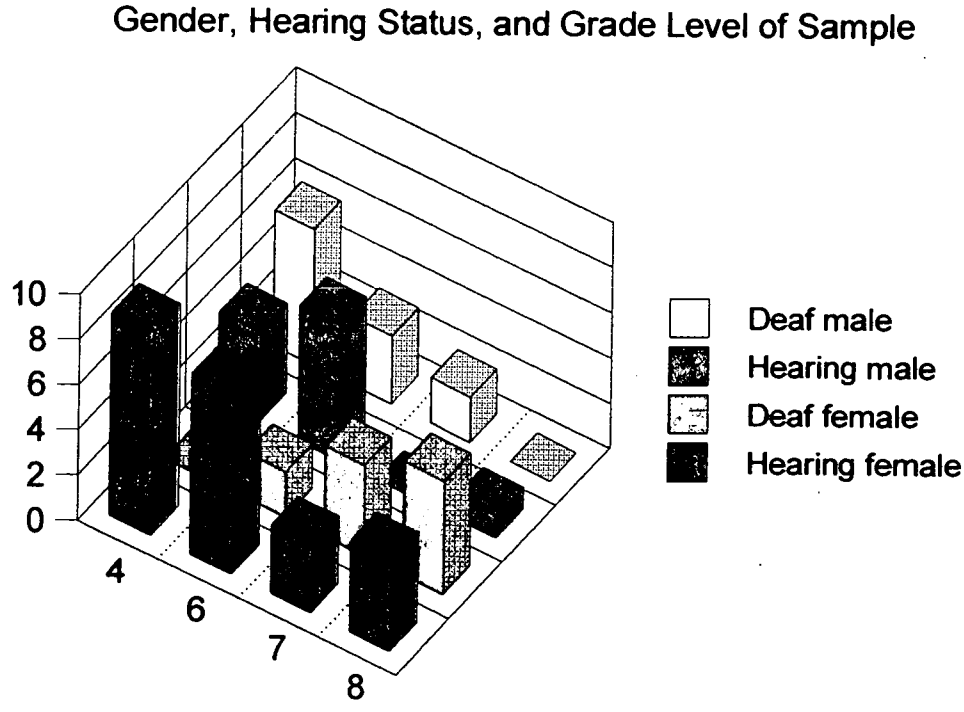
This presentation will describe the long term social integration of deaf or hard of hearing students who have experienced co-teaching in the early grades. The purpose of the study was to investigate the stability of the social outcomes of co-teaching.

The sample for the full study consists of the deaf or hard of hearing students at two schools with extensive experience in co-teaching in grades four through eight who were in co-teaching situations up through third grade. In addition, a random sample of five or six hearing students from each class within grade levels four through eight are tested as a comparison group. However, because of problems during the data collection phase, this paper will only report on one of the schools.

Sample

The data for this study came from fourth, sixth, seventh, and eighth grade deaf or hard of hearing students in a co-teaching or team teaching program matched with a randomly selected sub-sample of peers. Figure 1 below presents the gender and hearing status of the sample by grade level. As is apparent from Figure 1 below, the random sample within classroom process produced unequal cell sizes for gender. This may have introduced some inexplicable variance in the results.

Figure 1



Instrumentation

Childhood Loneliness Scale. (Asher, Hymel & Renshaw, 1984). This is a 24 item self-report measure consisting of 16 items that measure loneliness and social dissatisfaction with 8 distractor items. Item loadings on the factor of loneliness range from .51 to .73. To avoid biasing children's responses, it is titled the **Children's Interests Scale.**

My Class Inventory. This is the short form of the Learning Environment Inventory. It is a 25 item true/false format questionnaire which taps five characteristics of classrooms: cohesiveness, friction, satisfaction, difficulty, and competitiveness. It was originally standardized in 1982 on 2,305 seventh graders in Tasmania. Individual alpha coefficients for the sub-scales range from .62 to .78; however class mean alphas range from .73 to .88. The My Class Inventory was developed for measuring aspects of the learning environment or social climate related to educational objectives.

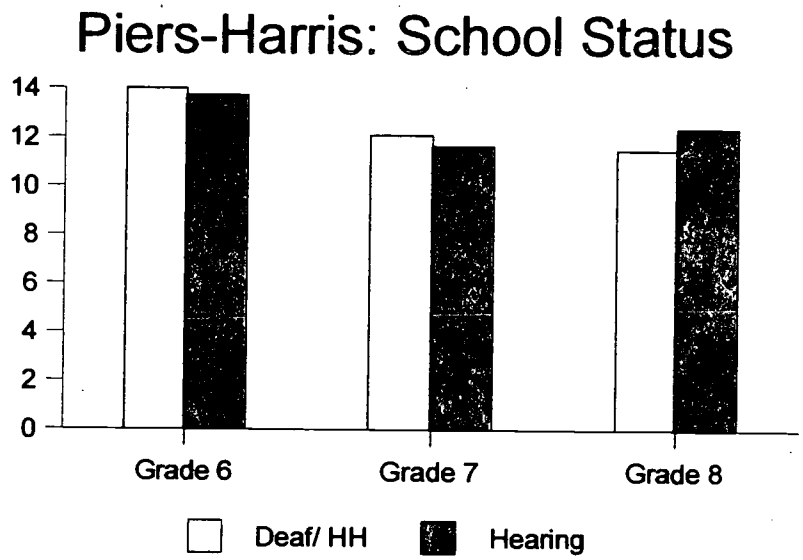
Piers-Harris Self-Concept Scale. The Piers-Harris Children's Self-Concept Scale is a brief (60 items) self-report measure which reflects both a description and an evaluation of one's own behavior and attributes. The measure provides an overall scale and six sub-scales. We chose to use the intellectual and school status sub-scale, the popularity sub-scale, and the happiness and satisfaction sub-scale. These sub-scales were chosen because they focus more on social or psycho-social issues.

Results

Each of the following charts present a grade level measure for the deaf or hard of hearing students in the Tripod/Burbank program and an appropriate baseline for hearing peers. The conservative statistical approach would call for the computation of a repeated measures analysis of variance; however, because of the nature of the research question — detecting the absence of differences — the more liberal approach of individual statistical test was used in order to compensate for the low power of the small sample.

Piers-Harris. The baseline group or norming group for the **Piers-Harris** consisted of 1,183 school children from a small town in Pennsylvania obtained during the early 1960's. *Intellectual and school status* is the child's self-assessment of his or her intellectual or academic abilities including general satisfaction with school and future expectations. As such the scale reflects not only the child's sense of his or her ability to function in school but their opinion of their current situation.

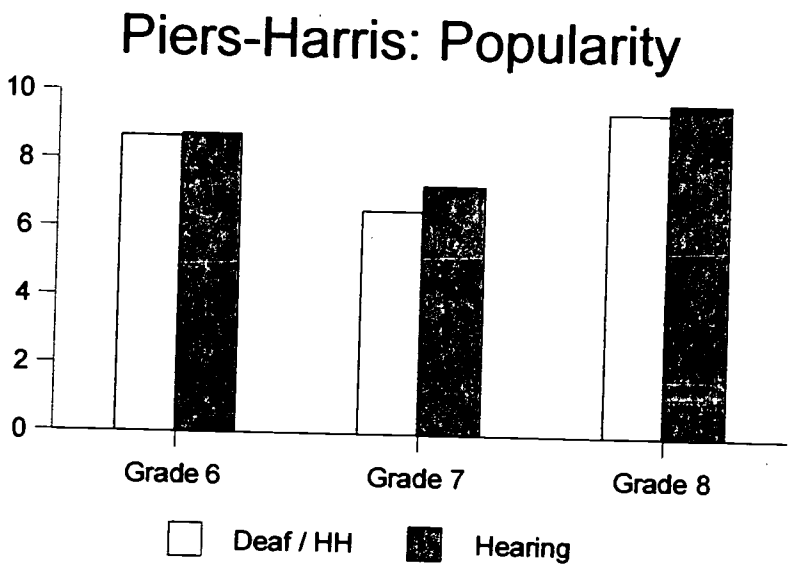
Figure 2



Grade level differences are apparent from Figure2 above ($F = 4.24$; $p < .024$; $df = 3,39$) while there is no difference between deaf and hearing students ($F = 0.12$; $p < .914$; $df = 3,39$); nor is there an interaction between grade level and hearing status ($F = 1.01$; $p < .377$; $df = 3,39$). It would be reasonable to conclude that school status — which includes self-appraisals of worth and importance — decline as children enter puberty ; however, the construct is not able to differentiate between deaf and hearing students in a team teaching situation. The apparent interaction between age and hearing status as seen in Figure 1 above is not supported by the ANOVA results.

Popularity is the child's evaluation of his or her acceptance by his or her classmates including being chosen for games and the ability to make new friends.

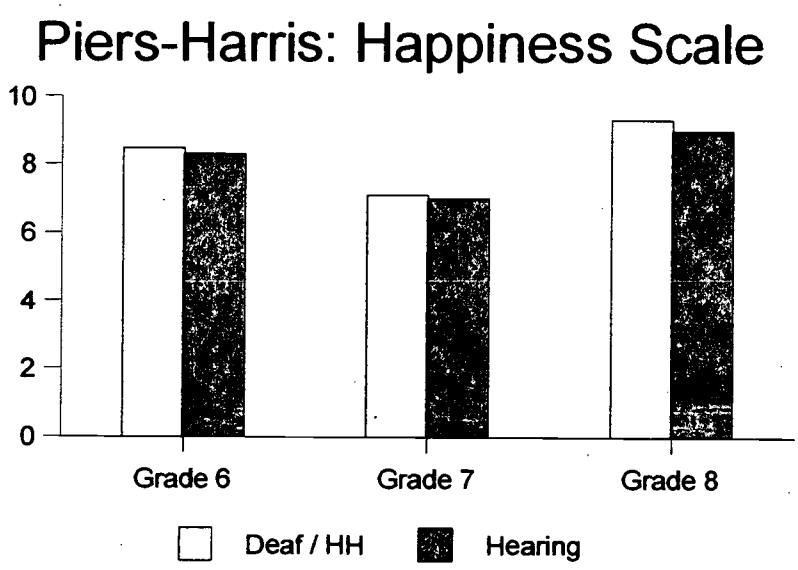
Figure 3



Grade level differences are apparent from Figure 3 above ($F = 3.33$; $p < .05$; $df = 3,39$), while there is no difference between deaf and hearing students ($F = .578$; $p < .453$; $df = 3,39$), nor is there an interaction between grade level and hearing status ($F = .140$; $p < .870$; $df = 3,39$). There is inexplicable variation across grade levels; however, the construct is not able to differentiate between deaf and hearing students in a team teaching situation. The apparent interaction between age and hearing status as seen in Figure 1 above is not supported by the ANOVA results.

Happiness and satisfaction describe a happy, easy to get along with person who is generally satisfied with life. Students scoring high on this scale see themselves as good people who are fortunate.

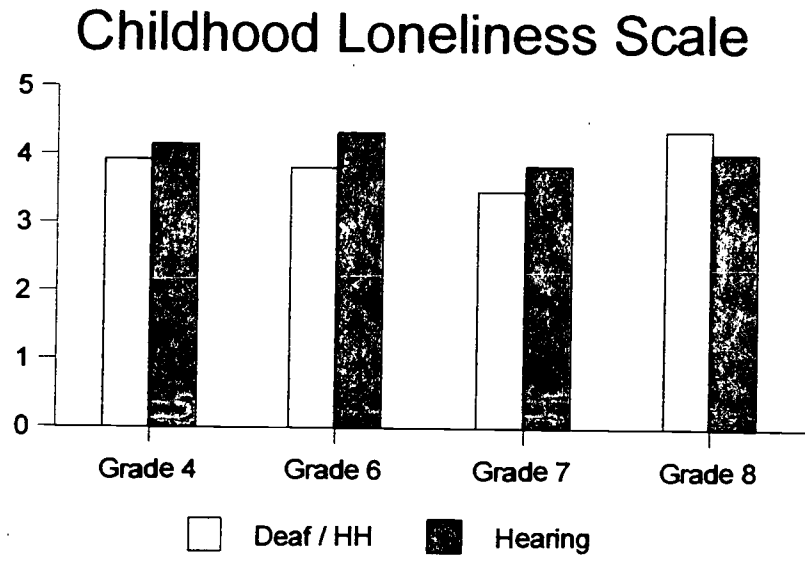
Figure 4



This chart reflects the same trend noted in the popularity chart. Clearly, the seventh grade group is less satisfied than the sixth or eighth grade ($F = 5.04$; $p < .02$; $df = 2,39$). While there is no difference between deaf and hearing students ($F = .886$; $p < .354$; $df = 2,39$); nor is there an interaction between grade level and hearing status ($F = .097$; $p < .908$; $df = 2,39$). Again, there is variation across grade levels; however, the construct is not able to differentiate between deaf and hearing students in a team teaching situation. The perceived differences in grade level may represent on the basis of the two measures — popularity and happiness — more an artifact of attitudes toward the teachers than age related differences.

Childhood Loneliness Scale. According to the authors (Asher, Hymel & Renshaw, 1984), about one quarter of all hearing children experience some degree of social isolation in school. This measure taps that sense of isolation.

Figure 5

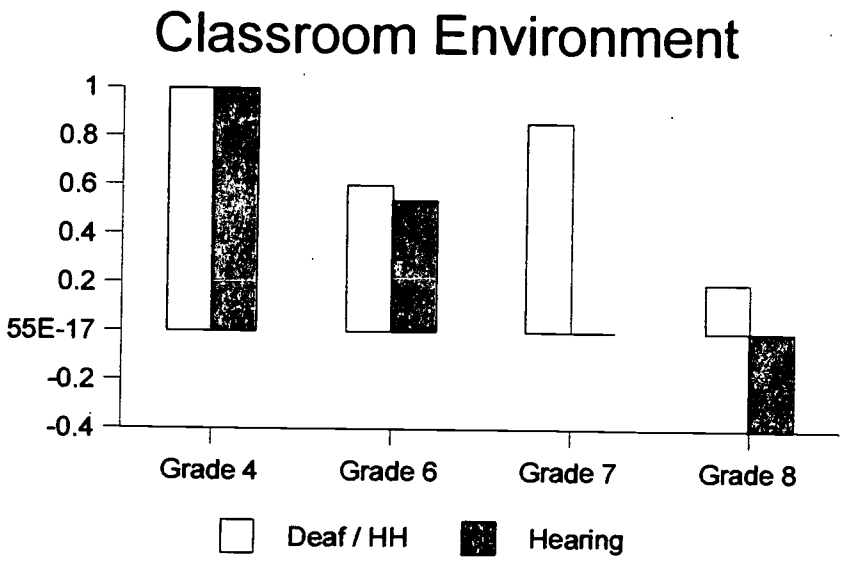


For this measure, the reading level was sufficiently simple that fourth grade children were included. Because of administrative problems, the fifth grade class data was not available in time for this analysis.

The teacher effect noted in the previous two measures was not apparent in this measure. There was no effect for grade level ($F = 2.37$; $p<.08$; $df = 3,59$); nor was an effect noted for hearing status ($F = 2.19$; $p<.15$; $df = 3,59$). It would be possible to suggest that there would be an effect except for the low power of the sample; however, even at the .05 level of significance an infinitely sized sample would still require an F value of 2.6. Consequently, we can reasonably reject the explanation that no effect was noted due to low power.

My Class Inventory. For this measure, the reading level was sufficiently simple that fourth grade children were included. Because of administrative problems, the fifth grade class data was not available in time for this analysis. The **My Class Inventory** is a general measure of classroom satisfaction in which a negative value indicates a dislike for the classroom. Using the sub-scale that measures a student's liking for the overall class situation, the following was noted.

Figure 6



Unlike the previous measures, the student's attitudes toward the classroom environment did show a difference between the deaf and hearing children ($F = 5.29$; $p = .03$; $df = 3,59$) and a difference among grade levels ($F = 8.20$; $p = .001$; $df = 3,59$); however, there was no interaction between grade level and hearing status ($F = 1.55$; $p = .214$; $df = 3,59$).

Overall, the deaf and hard of hearing students were more positive about their classroom situations than the hearing students. In fact the eighth grade earing students actively disliked their class while the deaf or hard of earing students were positive to neutral in their attitude. This difference appears to increase with age, but that effect was not statistically significant.

Conclusion

There are several critical limitations to this study including the use of a single site and the confounding of grade level, child's age and teacher effects. None of these problems are remediable given that there are no other team-teaching programs with the same number of classrooms as the

school reported here. While highly intriguing , the results should be considered very tentative in the absence of support from other sites.

Further, there are some complicated interactions in this data which are probably an artifact of the limits of the study. Specifically, the seventh grade deaf group confounds lower self-image, gender, and a high regard for the classroom. In other words, seventh grade deaf or hard f hearing girls were unsure of themselves but liked their classroom.

The implications of this study are that co-teaching offers a viable alternative to the current dilemma of the residential school which offers a deaf community but a poor record of achievement and inclusion which promises better achievement but results in increased social isolation. While not conclusive, this small study shows that children team taught over a long period of time are not socially isolated, not lonely, or have self-images lower than their hearing age peers. In fact the only reasonably consistent result was a declining appreciation of school among the students as they enter puberty. While it is possible to limit the generalizability of these results of this study, but it is not possible to dismiss the need for further work in this form of instruction that promises to resolve many of the current problems posed by the inclusion of deaf and hearing students in regular education.

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ACTION RESEARCH: FOCUS ON THE CLASSROOM
Deaf Students' Perception of Schooling

PAMELA LUFT, SUSAN BROOKS, SUZANNE ROSENBERG

Literacy Research Initiative

Kent State University has initiated a collaborative research project involving classroom teachers, doctoral students, and researcher faculty in collecting students' perceptions of school. The Literacy Seminar and Collaborative Research Group has met once a month for the past year to develop this collaborative research project as well as to hear presentations by faculty, students, and collaborating school personnel about specific literacy issues and research. Team membership has been flexible and varies from between 15 and 30 persons, representing most of the major school programs from the Northeast Ohio region. The project uses qualitative techniques and specifically, critical incident methodology. The team chose a constructivist perspective to examine how students' perceived literacy experiences in school. In order not to prejudice the students to describe specific literacy activities, the students are being asked to describe their overall perceptions of schooling experiences. This also allows the researchers to contrast both quantity and quality of responses about literacy activities, with those describing other school activities. Aggregating responses across the sample pool will provide a rating of perceptions of within the milieu of all school-related activities. The questions focused specifically on determining if literacy activities were considered to be either most or least effective by students, and to examine how type of previous literacy instruction they have received (e.g., student-centered and whole-language vs. teacher-directed and skills-based) influenced the nature of their responses.

The Collaborative Research Group has based it's functioning on Wasser and Bresler's (1996) article describing the evolution of collaborative research projects. This has resulted in

the flexible and evolving membership, limited only by commuting distance to attend meetings. Each member has been free to determine a specific population to target for interviewing. Interview formats also allowed choice in using paper-and-pencil, or face-to-face interviews. Although the majority of the literacy team members endorse a whole-language philosophy of instruction, classroom selection has been open ended to include the entire spectrum, if possible.

Students included in the study to date have ranged from age 8 through college seniors, in traditional public school classrooms as well as in experimental and multi-age classrooms. It was believed that age-related factors would change the nature of responses and thus, a wide pool was considered optimal. For example, several members felt that college students, just prior to or at the beginning of their student teaching, are particularly reflective of the type of instruction they received and would be a valuable target group.

Inclusion of Deaf Students

None of the other group members represent a special or diverse population. The study of deaf students' responses was suggested as an alternative group to include to represent an aspect of existing student diversity. The broad sample of hearing students would provide a rich source of comparison data for analyses of the Deaf students' responses.

In addition, deaf individuals have historically had to rely upon hearing individuals to provide their "voices" and have only recently, become empowered to speak for themselves (cf. Lane, Hoffmeister, & Bahan, 1996; Moores, 1996). This extends to Deaf students, who are rarely asked their opinions on schooling and education. This research project provided an opportunity to use their responses in meaningful way that could impact both inservice and preservice teacher preparation. The Collaborative Research Group welcomed the opportunity to include this population into the interview sample in order to support these efforts.

Data Collection

Interviews began on a pilot basis during Spring 1997 with minor revisions made in the question format. Since that time, researchers have become increasingly systematic and focused in their collection. Aggregation of the initial sample of data began during late Fall 1997. Data from interviews was transcribed from audiotapes with field notes also entered into a general database.

Collection of data from Deaf students began during late Fall 1997 and the interview process will continue for some time. The Kent faculty member sought collaboration with two teachers in Findlay, Ohio (near Toledo) who have been doing extensive student-centered, whole-language literacy activities. One received outreach training from Gallaudet's Pre-College Programs and is currently a doctoral student at Kent. The data from this site will be shared at the conference, addressing general themes found as well as unique individual examples of response to literacy activities. These data have been videotaped and transcribed, with field notes added to each transcript. Interviews consist of a written survey and/or a videotaped interview. The Written Survey consists of two questions:

(1) Tell about something you had to do either in school or for homework that you thought was really fun and that you learned a lot from. Describe this activity as much as you can.

(2) Tell about something you had to do either in school or for homework that you did not like and did not learn from. Describe this activity as much as you can.

The Critical Incidents Interview consists of a statement followed by neutral probes to elicit substantial detail.

(1) "Think of a time in school when you really learned a lot and enjoyed what you were doing. Tell me about it--what did you do? who did you work with? how did it go? what did you do first, second, etc.? what did you learn? why? why did you like it?"

(2) Think of a time in school when you didn't learn very much and did not enjoy what you were doing. Tell me about it--what did you do? who did you work with? how did it go? what did you do first, second, etc.? why didn't you learn very much? why didn't you like it?"

(3) "If you could change the things you do in school, what changes would you make? Why?"

For each child, their grade school, school location (inner city, urban, suburban, rural), reading level, previous and current literacy instruction, and other relevant classroom or instructional information will be recorded on a cover sheet.

Interviews of the two large Deaf programs in Akron and Cleveland have been slowed by bureaucratic procedures. Human Subject Review processes were inadvertently delayed within the system. The data collection will commence later this spring and may expand to include the Ohio School for the Deaf and other programs neighboring Kent State University as available.

Conclusion

This data pool is expected to form a substantial description of current literacy instruction, and its impact on student perceptions. These results will be used to inform the practice of sampled programs as well as pre-service students at Kent State University. Response comparisons will be possible between student-centered and teacher-directed programs; Signed English and Bi-bi programs; urban, suburban, and rural programs; and ages of students. This current pool reflects primarily sign language-based programs, however there are a few oral and auditory-verbal programs also within Kent's proximity which could provide an additional comparison sample. Additional programs may be included as data collection progresses with the current sample group.

This data collection also could be used as a basis for longitudinal evaluation by specific

programs, and across programs. These results could be used to significantly impact literacy instruction of Deaf students in this region of Ohio with implications for literacy instruction in general, and the educational impact on Deaf students with regard to achievement and motivation to complete schooling.

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FOCUS IN THE CLASSROOM
Students as Synthesizers and Evaluators of Web-Based Instructional Units

PAMELA LUFT

Introduction

Internet based instruction allows learner flexibility and choice in sites, according to learner style and preference (Gagne & Briggs, 1979; Hannafin & Peck, 1988). Use of web sites provides unique access to graphics and short videos which can greatly enhance the learning of Deaf and hard of hearing students. Because various characteristics of visuals (complexity, design, color and contrast) are not equally intelligible to all students (Dwyer, 1994), self-selection of sites allows students to choose those that are most appropriate for their visual preferences in additional to learning styles.

Involving students to design and create the focus of their instructional unit can enhance their motivation and involvement and ultimately, their learning (Hannafin & Peck, 1988). A well-designed unit that involves a variety of learning settings (individual, paired, small group) as well, can lead students to reflective evaluation about their own and others' learning processes. This differs significantly from teacher-directed learning which often focus on acquisition, comprehension, and application of knowledge to a specific learning situation and much less so upon using these levels to further analyze, synthesize, and evaluate the impact and implications of this knowledge (cf. Heward & Orlansky, 1992, Bloom's Taxonomy, p. 474). An instructional unit in which students play a co-director's role requires that they perform these higher level skills in order to design an appropriate progression of learning activities, for the full group of students.

Students as Researchers

Integration of basic data collection measures into an Internet-based instructional unit can allow students to become integral lesson/unit evaluators, a necessary element of instructional

design for assuring learning for the other students as well as themselves. Fundamental mathematics provides the basics for simple qualitative and quantitative methods of evaluating data.

Addition.

1. Survey data with counts across identified variables and aggregated to develop line graphs, bar charts (number sites identified across multiple search engines).

2. Counts of the numbers of times certain variables appeared in a pool of information and aggregated to create various graphs and charts (e.g., number of allusions made to television increasing student violence in sites describing problems with violence).

3. Counts of student usage and frequency for specific variables of study, and aggregated to create graphs and charts (e.g., specific web site access, computer use during structured or free time).

4. Categorization of interview response elements into themes and counts of theme emergence frequency within students and between students.

Subtraction.

1. Comparison of two sets of survey or count data to find the differences between, and used to create various charts or graphs.

Multiplication.

1. Use of class averages data, multiplied by average number of student users across the county, state, or country to extrapolate average usage figures.

Division.

1. Addition of rank orderings across a variable and division by number of entries to compute the average/mean ranking (average of student rankings for usefulness/relevance of web sites identified across various search engines; average ranking of statements of student

evaluation of the unit).

Comparison and contrast across class regarding preferred search engines, web sites, design of web sites, on-line experts used, cross-class collaboration, and bulletin boards with a focus on why these sites were preferred would provide initial individual information regarding learning style preferences and strengths. Compiled across a class, it would provide students with information about qualities of sites, on-line communication, and Internet usage that are optimal in terms of future work.

Utilization of Research Data

Initial calculations or theme identification integrate use of knowledge through the application levels. The more difficult aspects of research and learning are with the appropriate interpretation of these applications in order to analyze, synthesize, and evaluate the importance, relevance, and potential impact of research results (cf. Kirk, 1982; Pedhazur, 1982). Each of the mathematical operations above require interpretation in order to ascribe meaning to their results. Paired, small-group, and teacher-led open-ended discussions could be used to initiate, refine, and evaluate the analyses and syntheses. These student-centered evaluative discussions would provide information to students about their own and others' progress through the unit, and reinforce the synthesis of individual concepts across the unit's whole. In addition, it provide valuable data to the teacher in planning for future revisions with other classes and units.

Teacher Strategies

Classroom teachers could initiate a unit with open-ended questions about a topic of mutual interest. From this discussion, the teacher could facilitate the class' development of a semantic web or concept map from which the full unit would be created. At the unit's end, students could be asked to answer these same introductory questions in order to evaluate their overall learning and progress, as well as to identify specific strategies they used in obtaining

answers or responses to these questions, and to evaluate whether or not this process met their expectations for learning. In order to facilitate opportunities for feedback and support to individual students and to maximize the assistance available from the teacher, students would use the semantic web or concept map to scheduled the variety of activities needed to complete the unit. These activities would vary between individual, paired, and small group formats according to the type of activity performed and student learning style preferences. To teach collaboration and negotiation skills as well as independent work skills, all students would spend time in each learning format. These formats would be included as a topic of the unit evaluation.

Schedules of meetings within these pairs and small groups, and between these groups and the teacher, would result in further elaboration of project goals related to the unit and timelines for completing activities related to each goal. These would be periodically reviewed by the teacher and used as a basis for individual or group conferencing. The teacher would use these conferences for mutual problem solving in ways that supported student responsibility for achieving these goals. For example, each student would mark activities completed for each goal on a schedule sheet. This would be used for evaluating themselves, their partners, members of their small groups, and of the entire class. Evaluation would occur in terms of both contributions toward goals completion and identification/resolution of barriers. The daily and weekly recording of progress (ahead of schedule, on schedule, behind schedule; activity/goal completed or in progress) and member contribution (completed own work, assisted partner/peer, completed additional work, did not complete work, incomplete/unsatisfactory work) would provide information across the class about successful work partnering formats.

Conclusion

Use of Internet-based instructional units can support student-centered involvement leading to higher levels of learning such as knowledge analysis, synthesis, and evaluation. In

addition, allowing students to become co-directors of research programs within the classroom can assist the teacher in evaluating their progress and learning. This type of involvement also supports increased levels of student motivation and engagement during the learning process.

Many of the evaluation forms to monitor research results and progress could be developed and maintained by the students. Simple mathematical functions allow tabulation of quantitative data in formats that provide functional application of these math skills. Qualitative information could be accumulated similarly and in terms of "why" aspects of preferences, types of barriers and themes that characterized group experiences, and learning expectations about the unit. The result of an instructional unit of this type would be an increased understanding of one's own preferences and a sense of the variation (diversity) that occurs within a group. Students would gain valuable insights into the higher levels skills necessary for interpretation and use of data, and the benefits as well as weakness of such approaches in our quests to better understand ourselves and our world.

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THE DEVELOPMENT OF A CD-ROM TO TEACH SPEECHREADING SKILLS

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Abstract

Members of the Department of Communication Disorders and Special Education and the Institute for Interactive Technologies (IIT) at Bloomsburg University began the development of a computer-based interactive videodisc instructional program to teach speechreading skills in 1991. Since that time, a CD-ROM program has been developed using video clips and text from the videodisc program. *Speechreading Challenges on CD-ROM* provides users with practice in speechreading words, sentences, and stories presented by over 150 people in a user friendly environment. Unlike traditional videotapes, CD-ROM technology provides immediate feedback to the user in an interactive format. To determine the original videodisc program' s effectiveness in teaching speechreading, a comprehensive evaluation of the program was undertaken, the results of which were published in a 1995 *American Annals* article (Slike, et al., 1995). Seventy-four college students participated in the study using the program to learn speechreading skills. Results indicated a statistically significant improvement in speechreading ability from pretest to posttest measures on both the videodisc program evaluation as well as on the Costello Test of Speechreading. With these positive results and with the increased usage of CD-ROM technology, it was determined that a conversion of the videodisc program was in order.

Since 1986, Bloomsburg University of Pennsylvania has been using videodisc technology to teach an introductory course in sign language. Slike, Chiavacci, and Hobbis (1989) showed that college students could learn sign language vocabulary using this technology as efficiently and effectively as learning signs in a traditional classroom manner (i.e., demonstrating signs and having students write descriptions of them in class). The entire course of signs is now a two videodisc program entitled, *Introduction to Sign Language: An Interactive Videodisc Approach,* and is marketed nationally (Slike, et al., 1991). Over nine hundred students at Bloomsburg University have used the videodiscs to learn sign language since the project's inception. Conversion of this program to a CD-ROM format is in progress.

Recently, a new product has been developed for persons with a hearing loss who are interested in improving their speechreading skills. Through a cooperative effort between the Department of Communication Disorders and Special Education and the Institute for Interactive Technologies at the University, an eleven-chapter "visual book" was created entitled, *Speechreading Challenges on Videodisc* (Slike et al. 1993). The contents of this product have recently been converted to CD-ROM. To use this visual book, a Macintosh Computer with a CD-ROM player is required.

Creation of a Visual Book

The original videodisc was created to determine if this technology would be an effective way to teach speechreading. College students with hearing losses, adventitiously deafened adults, teachers of the deaf, as well as hard of hearing participants at a state-wide Self-Help for the Hard of Hearing (SHHH) conference were asked to provide feedback on the usefulness of the system. Additionally, faculty and staff members from the Institute for Interactive Technologies were asked to evaluate the program from a technological standpoint. Data were collected from all of the above participants using an evaluation questionnaire that included

overall ratings of the program, appropriateness of the vocabulary, ease of program use, quality of the video, and prior speechreading ability of the users.

With the input collected from these pilot program evaluations, an eleven chapter hard-copy text was compiled. This text serves as the user's guide for the CD-ROM program described in this paper.

Shooting the Video

After the text for the videodisc user's guide was written, over 150 people were videotaped saying the chosen words, sentences and stories found in the guide. The speakers, who ranged in age from 4 to 72, were videotaped simultaneously with two cameras, one to provide and upper body (shoulders and above) view and the other to provide a close-up oval of only the lips.

Each chapter was videotaped at increasingly more difficult viewing angles, with the first chapter providing a full facial view and the last chapter offering only a profile from which to obtain information. The goal of this presentation format was to provide as many realistic speechreading challenges as possible. Frequently, in group settings, it may be impossible to get a full frontal view of the person speaking, and this provided the impetus for selection of various viewing angles. Additionally, some speechreading distractions were included to show users (especially future teachers of the deaf and hard of hearing) how difficult speechreading can be when people are chewing gum, sucking a lollipop, scratching their long mustaches, etc. A number of foreign speakers (i.e., Russian, Brazilian, and Bangladeshi) were videotaped to show how a foreign accent influences a person's ability to speechread. Editing of the videotapes resulted in a master videotape, which was converted into a 60-minute, two-sided constant angular velocity (CAV) laserdisc. A Macintosh computer was programmed using Hypercard and then interfaced with the laserdisc player.

Pre-posttests

Pre and posttests of twenty sentences were created in the program to determine a user's speechreading ability prior to and following the use of the program and to collect information on the program's effectiveness. During each test a user is required to speechread three males and three females saying a combined total of twenty sentences on CD-ROM. Users are tested on their ability to speechread two sentences from each of the chapter topics. To insure test reliability, neither the sentences nor the speakers are seen anywhere else in the program. After the user completes the entire program, the pre and post scores can be compared to determine whether improvement in speechreading ability has occurred.

Each chapter has 30 to 40 vocabulary words, 20 sentences, and a short story that can be viewed in either a learn mode or a challenge mode depending on the preference of the user. In other words, the user can choose to read the text of the words or sentences spoken by the person in the video before seeing the speaker (learn mode) or the user can choose to test his or her speechreading ability by attempting to speechread the speaker on the video and then choosing the answer they think is correct from a multiple choice question (challenge mode). The program can be viewed with or without accompanying audio. The program was developed to be non-threatening and user friendly.

Conversion to CD-ROM

The development of high quality, large capacity compact discs and consumer acceptance of this new technology required the conversion of *Speechreading Challenges on Videodisc* to a CD-ROM (Compact Disc - Read Only Memory) format. In January of 1996, a team of graduate students, staff, and faculty was formed to participate in discussion sessions regarding how the videodisc program could be converted to a CD-ROM format. The result would be the new *Speechreading Challenges on CD-ROM* which would provide an inexpensive, compact and

virtually indestructible product for the user.

The team initially spent time analyzing the advantages of the new storage medium and redesigning and flowcharting the program which would now also give the user access to the full content of the program through a dictionary. The new format would contain the program content, including all audio and video material, as well as the computer code to run the program. Considering user ease, this reduced the program package to one compact disc and the hard copy user' s guide.

The team decided upon the look of the new CD-ROM program and designed an entirely new graphical interface taking advantage of color and the incorporation of a video window on the computer screen. Conversion was divided into task areas for the students who worked on converting the original HyperCard code into SuperCard code, developing the graphics pages for the interface, and digitizing the existing 1000 plus video clips into a real-time format which would now reside on the CD-ROM. Time was spent in research and training on the use of the new audio-video board to attain the quality video performance required for the project.

Evaluation of the conversion process followed closely as the new program was developed. Students, staff, faculty, and individuals with a hearing loss reviewed the program from a technical viewpoint as well as content applicability and ease of using the program. A new user=s guide was created to match the new look and flow of the program. The completed form of *Speechreading Challenges on CD-ROM* is undergoing extensive use and continuous evaluation by students in the IIT and graduate students in the Education of the Deaf/Hard of Hearing program.

Goals

The goals of *Speechreading Challenges on CD-ROM* are:

*To provide individuals with a hearing loss an opportunity to speechread all consonants and vowels in the English Language.

*To provide a variety of faces to speechread

*To provide challenges in speechreading individuals from various angles.

*To provide speechreading practice on a variety of topics.

*To sensitize future teachers of students with a hearing loss to the difficulties involved in speechreading.

*To sensitize users to the difficulty of speechreading individuals speaking in atypical ways (while chewing gum, with a lollypop in the mouth, with a mustache, etc.)

Currently a prototype of the CD-ROM program is being used by adventitiously deafened adults in Bloomsburg University=s Speech and Hearing Clinic with much success. Graduate students in Education of the Deaf and Hard of Hearing and Speech Pathology/Audiology programs are finding the program to be a useful supplement to teaching speechreading skills to these adults.

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COMPARISON OF COMPETENCIES OF COCHLEAR IMPLANTS BETWEEN TEACHERS OF THE DEAF/HARD OF HEARING VERSUS SPEECH-LANGUAGE PATHOLOGISTS

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The purpose of this study was to determine if there was a difference of cochlear implant competencies between teachers of the deaf/hard of hearing vs. speech pathologists. A cochlear implant is a surgically implanted device which is designed to provide useful sound information by directly stimulating the surviving auditory nerve fibers in the cochlea (Cochlear Corporation, 1996). The teachers of the deaf were trained and certified by CED (Council of Education of the Deaf). The speech pathologists were trained by programs approved and certified by ASHA (American Speech, Language, and Hearing Association). Both professionals were certified to teach in the public schools. This study examined the knowledge and competencies of teachers of the deaf and speech pathologists in their work with cochlear implants. This study was designed to determine if clients of cochlear implants are better served by teachers of the deaf or by speech pathologists.

Cochlear implants are being established as effective options in the habilitation and rehabilitation of individuals with a profound hearing impairment. There are a few concerns that need to be examined with cochlear implants. One issue is that no research has been done on cochlear implants competencies between teachers of the deaf/hard of hearing vs. speech pathologists. Both professionals have clients with varying degrees of hearing losses, and are likely to receive a child/adult with a cochlear implant in the future. A second issue is that professionals who work with children with cochlear implants should be competent in this area. A professional who serves persons with a hearing loss must be a person who has requisite training of all aspects. The CED (Council on Education of the Deaf) certifies programs that train professionals to work with persons with hearing impairments. CED attempts to ensure that all professionals that are going to work with deaf/hard of hearing individuals are proficient in areas of communication, language development, academic achievement, and psychosocial functioning.

A study was done by Christopher Scwilk (1996) which was a competency comparison of speech pathologists vs. teachers of the deaf/hard of hearing in private practice. His results indicated that teachers of the deaf/hard of hearing were more competent to serve individuals with a hearing loss than speech pathologists. His results also indicated that the speech pathologists in the research felt that the teachers of the deaf/hard of hearing were more qualified to serve individuals with a hearing loss.

A second study was done by Dixie D. Sanger, Karen Hux, and Katherine Griess which examined 628 educators' opinions about the role and performance of speech pathologists. The results indicated that educators have positive opinions about speech pathologist services; however, responses to the survey suggested some uncertainty about speech pathologists' roles, adequacy of their training, and knowledge on recent trends.

Professionals who work with deaf/hard of hearing children need to be competent in their knowledge of cochlear implants. Teachers of the deaf/hard of hearing and speech pathologists are two professionals who work with children with hearing losses. Research needs to be done in order to determine who is more qualified to work with children/adults with cochlear implants. This will aid in the rehabilitation and habilitation of the individual with the device.

Statement of the Problem

Is there a difference in cochlear implants competencies between teachers of the deaf/hard of hearing vs. speech pathologists.

Method

Subjects

Fifty-four (54) professionals, 25 teachers of the deaf/hard of hearing and twenty-nine (29) speech pathologists, served as subjects. Each of the professionals was randomly selected from two lists of licensed professionals (teachers of the deaf/hard of hearing and speech pathologists) obtained from Dr. Powers (Bloomsburg University), a board member for the Pennsylvania Board of Examiners in Speech and Hearing.

Each subject was currently employed and practicing in their field in Pennsylvania. Each

subject had at least a master's degree and one year of experience. Each subject also had at least one client with a hearing loss.

Measurement Instrument

The measurement instrument used in this study was a survey designed by the researcher. The instrument was created exclusively for the purpose of this study. The purpose of this survey was to determine if there was a difference in cochlear implant competencies between teachers of the deaf/hard of hearing and speech pathologists. The survey consisted of two parts: 1) demographic questions, 2) knowledge and competency of cochlear implants. The demographic questions asked descriptive information regarding certification and licensure, years of experience, number of deaf and hard of hearing individuals served, and number of individuals served with a cochlear implant.

The knowledge and competency questions asked skill-based and knowledge-based questions on the topic of cochlear implants. These questions focused on hearing loss, components, function, history, therapy, and candidates of cochlear implants.

Statistical Design

The 2-sample t-test was the statistical design used to analyze the data collected from the survey questions. This statistical design measured the two samples (teachers of the deaf/hard of hearing and speech pathologists) independently. The first test determined if there was a difference in mean scores between teachers of the deaf/hard of hearing and speech pathologists. The second test determined which group was more knowledgeable. The assumptions made with this statistical design were; 1) normal distribution and, 2) the samples were individually and independently distributed.

The formula for the 2-sample t-test is:

First Test

H_0: Teachers' of the Deaf/Hard of Hearing mean score = Speech Pathologists' mean score

H_a: Teachers' of the Deaf/Hard of Hearing mean score ≠ Speech

Pathologists' mean score

TS: $$= \frac{x_T - x_P}{\sqrt{\frac{\sigma^{2}_{T}}{n_T} + \frac{\sigma'}{n}}}$$

RR: $t < -2.33$ or $t > 2.33$

Second Test

H_0: Teachers' of the Deaf/Hard of Hearing = Speech Pathologists' scores

H_a: Teachers' of the Deaf/Hard of Hearing > Speech Pathologists' scores

TS: $$t = \frac{x_1 - x_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

RR: $t > 2.33$

Statistics Breakdown

H_0: . . . . . Null hypothesis
H_a: . . . . . Alternative hypothesis
TS: . . . . . Test statistic (*t*-test)
x_T, x_P: . . . . . Mean score of each sample
σ^2_T, σ^2_P: . . . . . Variances of each sample

Results

Demographic Information

	Teachers of the D/HoH	Speech Pathologists
Respondents	25	29
Years experience (avg.)	18.9	13.8
Clients w/ hearing loss (avg.)	10.0	2.4

Clients w/ a cochlear implant (avg.) 0.8 0.1

The results of the study were based on the following information:

Survey Scores

1) Teachers of the Deaf/Hard of Hearing

1) 50% 2) 60% 3) 55% 4) 70% 5) 75% 6) 70% 7) 80% 8) 85% 9) 80%
10) 75% 11) 95% 12) 65% 13) 45% 14) 90% 15) 75% 16) 85% 17) 95%
18) 80% 19) 70% 20) 50% 21) 95% 22) 80% 23) 80% 24) 70% 25) 95%

2) Speech Pathologists

1) 65% 2) 55% 3) 40% 4) 35% 5) 35% 6) 80% 7) 70% 8) 45% 9) 85%
10) 80% 11) 85% 12) 70% 13) 90% 14) 45% 15) 65% 16) 65% 17) 60%
18) 65% 19) 35% 20) 45% 21) 45% 22) 80% 23) 50% 24) 35% 25) 30%
26) 45% 27) 60% 28) 55% 29) 50%

T-Test Procedure

1) Person	Number	Mean	Std. Deviation	Std. Error
SP	29	57.962962	17.610052	3.389056
T of D/HH	25	74.800000	14.611639	2.922327

2) Variances	T	DF	Prob>|T|
Unequal	-3.7625	49.4	0.0004
Equal	-3.7353	50.0	0.0005

The result of the first t-test was 15.140. The rejection region was $t < -2.33$ or $t > 2.33$. The t-value was within the rejection region, therefore rejecting the null hypothesis. The t-test analysis of the test of knowledge and competency showed a mean difference of 16.52 percent.

The result of the second t-test was 15.140. The rejection region was $t > 2.33$. The t-value was within the rejection region, once again rejecting the null hypothesis. The teachers of the

deaf/hard of hearing averaged 74.80% on the test of knowledge and competency. The speech-language pathologists averaged 58.28% on the same set of questions. The variance among the teachers was 2.1316, while the variance among the speech-language pathologists was 3.0276.

Discussion

The hypothesis was that there will be no difference of cochlear implant competencies between teachers of the deaf/hard of hearing versus speech pathologists. The analysis demonstrated significant difference between the teachers of the deaf/hard of hearing and speech-language pathologists on this survey. The mean for teachers of the deaf/hard of hearing was 74.80%. The mean for speech-language pathologists was 58.28%. The range for the teachers of the deaf/hard of hearing was 45% and 95%. The range for the speech-language pathologists was 30% and 95%.

The prob>[t] value was 0.0004. The p-value indicated to the researcher to reject the null hypothesis. This is because the test statistic was into the rejection region. The testing of the data was conducted with a 99% confidence level. This gave the research a 99.9996% assured possibility that the null hypothesis should be rejected.

Conclusion

The results of this study disagree with the stated hypothesis. The results are significant because both teachers of the deaf/hard of hearing and speech pathologists work with clients with hearing loss. The teachers in the survey indicated more clients served with a hearing loss than speech pathologists. This result showed significant differences in the survey between the two professionals.

Some criterion should be noted about the results of the study. The results of the study

should not be generalized to the overall population of teachers of the deaf/hard of hearing and speech-language pathologists. The study included only licensed professionals in Pennsylvania. This study didn't include limitations on number of years since graduation.

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READING STRATEGIES: WHAT DEAF STUDENTS *CAN* DO

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The findings in this paper are part of a larger study which focused on the strengths of individual students who are deaf, as they realized their potential as efficient readers and writers of a language that they could not hear.

Reading and deafness is an area that has received much attention in research and practice for many years. Today, most researchers in deafness assert that students who are deaf do not achieve reading levels beyond the fifth grade. Ewoldt (1981) clearly explained that "since Furth's (1966) widely quoted study, it has been accepted as fact that deaf readers seldom achieve reading proficiency (above a fourth-grade reading level)" (p. 59). In 1988, the Commission on Education of the Deaf reported that "most children who are prelingually deaf experience serious difficulties in acquiring English language skills" (p. 15). The report also indicated that the educational system has not been successful in providing assistance to deaf students in order for them to "achieve skills commensurate with those of their hearing peers" (p. 17) and recommended that because reading achievement affects all other academic areas, literacy in English should be addressed as a top priority.

Studies from the 1960's until the present have established and concluded that deaf students read at a lower level than their hearing counterparts, as determined by reading comprehension and standardized test scores (Furth, 1966; Quigley, 1982; Wolk & Allen, 1984; Allen, 1986; Myette, 1992). Areas such as reading comprehension, linguistic competence, and vocabulary knowledge of deaf students have been compared to hearing students on tests which have been standardized for hearing populations. From these areas, several explanations have surfaced as to why hearing students out perform deaf students on standardized reading tests including; test bias against deaf

students (Ewoldt, 1987), inadequate methods of assessment (Ewoldt, 1987), inadequate language development (Schirmer, 1994), ineffective teaching methods and materials (Ciocci & Morrell-Schumann, 1992; Dolman, 1992), and finally an overall lack of knowledge of how deaf students read (Erting, 1992). While the evidence is debatable as to the reason or cause of this lower achievement, the issue has caused great concern for both educators and deaf individuals.

Reading Achievement and Language Development

Language development and reading have been inseparable for instructional purposes for teaching deaf students. So much so that traditionally reading has been viewed as the "primary vehicle for the development of language" (King & Quigley, 1985, p. 116) and language development has traditionally been assessed by "performances on reading achievement measures and written language samples" (Quigley & Paul, 1984, p. 21). However, when one considers language for students who are deaf, attention must be given to the fact that there are two languages, English and American Sign Language, as well as two modes of communication, visual-gestural and aural-oral.

It has been suggested that, unlike hearing children who have an extensive language base before they begin reading, most deaf children do not have a well developed language base when they enter school. Because most deaf children are born to hearing parents, when they come to school, they are often faced with the task of learning a signed or oral language for the purpose of communication as well as learning English for the purpose of reading and writing. Even those who do come to school with a first language (ASL) may find that it is not valued or used in the school setting (Lane, Hoffmeister & Bahan, 1996). Both groups will have the tremendous challenge of learning to read and write in a language to which they have generally had little exposure.

Reading Process for Deaf Students

Scholars have noted the limited amount of research which has been completed, that provides a good understanding of the reading process in deaf students. Paul (1993) noted that most of the

research has focused on deaf student's comprehension of syntax. As a result we know little about the strategies that deaf students are using to comprehend a written text, nor of the reading strengths that individual readers who are deaf possess. "Indeed, almost all educational research with Deaf children has been based on examining what they do not know. And while research in other fields, such as psychology and linguistics, has given us some tools to evaluate what the Deaf child does know, this information has not been incorporated in any coherent way into the educational system" (Lane, et al., 1996, p. 305).

Lane et al. (1996) have summarized what the existing literature in reading and deafness has found, stating:

> Research on the reading abilities of Deaf children reveals that they have difficulty learning how to read in English because of their lack of knowledge of English language structure, and because of their lack of integrating information from the past and using it in devising predictive and generalizable strategies for understanding print. Deaf children are said to lack these basic abilities because of lack of exposure to information within their environment, that is, a lack of background knowledge. This lack in turn appears to stem from a number of sources: growing up with little access to language at home and in school; ineffective instruction in school; and excessive time devoted to oral skills and English grammar and vocabulary rather than content acquisition (p. 280).

Assessment Procedures

Researchers have examined the premise that testing procedures historically and currently used with deaf students may not be an appropriate way to evaluate their abilities and competence in reading. Standardized tests have routinely been used as the primary method of evaluation and "to compare the reading of deaf and hearing children" (Ewoldt, 1981). Educators of the deaf have long realized that standardized tests are extremely limited in the amount and type of information that is

furnished (Ewoldt, 1981; Anderson, 1991; Hart, 1978). Currently, "the assessment most often employed with deaf and hard-of-hearing students is the Stanford Achievement Test" Hearing Impaired Version (SAT-HI) (Holt, 1995, p. 23). This special edition of the SAT test is the same test as is given to hearing students "but the screening test, test administration procedures, scoring, and norms are based on the needs of deaf / h.o.h. [hard of hearing] students" (Anderson, 1991, p. 27).

Miscue Analysis

There are few other assessment procedures which have been used to measure reading achievement for students who are deaf. Ewoldt (1981) advocated for the use of miscue analysis with students who are deaf or hard of hearing. "Miscue analysis is based on theoretical notions that are informed by linguistic, psycholinguistic, and sociolinguistic knowledge. It is also informed by a view of science: Miscue analysis is a tool that provides users with the power to inquire into their own questions and to solve their own problems in order to come to their own conclusions." (Goodman, Watson & Burke , 1987, p. x).

Miscue analysis is an assessment procedure which allows the instructor to examine the reading practices of students in a total language context, by comparing and describing the observed reading responses with the expected reading responses. Miscue analysis can reveal the reader's strengths and weaknesses as well as the strategies that the reader uses to comprehend a written text. Additionally, miscue analysis helps to describe the linguistic and background knowledge that a reader brings to the text. This is accomplished by examining three language cueing systems; syntactic, semantic and graphophonic. The syntactic system "refers to the interrelationships of words, sentences, and paragraphs within a coherent text" (Goodman, et al., 1987, p. 26). The semantic system refers to "the system of meanings in a language" (Goodman, et al., 1987, p. 27). And finally the graphophonic system "is the set of relationships between the sounds and the written form of the language" (Goodman, et al., 1987, p. 25).

An integral part of miscue analysis is the verbal (or signed) retelling that accompanies the reading of the text. Retellings have been used for many years as a form of research, but less often as a form of assessment (Anderson, 1991). During the retelling portion of the miscue analysis, students have the opportunity to discuss the story, allowing the teacher to gain insights into both the depth and breadth of the students knowledge, as well as to better understand the strategies that the students have used to comprehend a written text.

Ewoldt (1977; 1981) is the only researcher who has to date published in the area of deafness and miscue analysis. Based on her initial research, she has advocated holistic approaches in teaching reading to students who are deaf. Her work has been instrumental in shaping my theoretical beliefs. It has been 30 years since Ewoldt's original work was completed and yet I am able to echo her words, that "the reading of deaf children has been neither adequately evaluated nor fully understood... [and] little is known about the strategies used by deaf readers or about the degree of proficiency deaf readers might exhibit when given whole stories to read independently"" (1981, p. 59).

Comprehension Strategies in Reading

Goodman et al. (1987) affirm that there are universal strategies that all readers use before, during or after reading: initiating and sampling, predicting, and confirming (p. 29-33). Others list strategies as they are associated with teaching practices, including ways to help students develop and use a variety of strategies to comprehend a written text (Tierney, Readence, & Dishner, 1995; Weaver, 1994).

These combinations of strategies have in common, as the purpose of reading, to comprehend the written text. Many of the strategies overlap in purpose and function. However, research has demonstrated that proficient readers use a variety of strategies, in all three cueing systems (semantic, syntactic and graphophonic) (Goodman, et al., 1996; Weaver, 1994); reading with a purpose,

developing schema, activating background knowledge and experiences, using context cues, and monitoring comprehension.

Deaf Students and Reading Comprehension Strategies

Having worked with deaf students for several years, I was already familiar with the frustrations and weaknesses that many students experienced with English print. However, I wanted to know what the student's strengths were and how to maximize those strengths in the students' individual pursuit for comprehension of English print. Therefore, I wanted to explore the reading strategies that students who are deaf and who use sign language as their primary mode of communication use to comprehend a written English text, without focusing on teaching style or subject content.

Guided by Ewoldt's work (1977; 1981; 1984) I have presumed that the reading process is the same for students regardless of hearing status. I have also concluded that educators and researchers have been looking at reading and deafness from a negative, deficit point of view, focusing on what students with hearing loss *can not* do rather than what they *can* do.

To determine if deaf students, who used ASL as their primary mode of communication, use similar strategies as hearing students to comprehend an English text, several students from a large residential school for the deaf, in the southwestern part of the United States, were given the opportunity to read an entire text and respond by retelling the main points of the text in their preferred mode of communication. Information from their reading miscues, along with interviews and student observations provided evidence of the many strategies that students were using to comprehend the written text. Table 1 provides an overview of the strategies that one middle school student used.

Table 1: Reading strategies employed by one deaf middle school student

read entire chapter or section

used dictionary before and after reading to determine word meaning

matched text definition with dictionary definition

guessed at the meaning from the context

guessed at the meaning from pictures

asked a teacher (or other adult) for help

asked a peer for help

discussed books with peers

wrote new sentences based on the text context

drew pictures to represent the meaning of the word

acted out new vocabulary words

made up stories using new vocabulary from the story

used the spell check on the computer

signed and fingerspelled words and phrases to himself

used classifiers when reading the text

used silent reading

predicted words, phrases and story events

summarized story events, in writing and in sign

used new vocabulary from texts in own writing and in spontaneous expressive communication

made connections to other books and to real life experiences

Each person is unique and certainly faces the challenge of reading in their own way, utilizing the strategies which best facilitate comprehension. It would be unfair to assume that all deaf students responded to a written text in an identical fashion as the young student presented here. However, the purpose of this inquiry is to show that deaf students can comprehend a written text.

Furthermore, to bring to the forefront of the minds of the educators that with adequate methods of assessment and an attitude of what the student *can* do rather than what the student *can not* do, deaf students and educators will begin to witness greater success in reading comprehension.

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A "TEACHER FRIENDLY" LANGUAGE ASSESSMENT INSTRUMENT ---NORMATIVE DATA ON BASAL READERS---

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Introduction

Much has been written about the acquisition of literacy skills by children who are deaf or hard of hearing. Many writers have argued strongly for the assessment of spontaneously produced language, but relatively few guidelines or assessment strategies have been recommended (Merritt and Culatta, 1998; Vaughn, Bos and Schumm, 1997; Ross, Brackett and Maxon, 1991). Some researchers have attempted to provide information related to the acquisition of written language by these children with the primary focal point being the patterns or language structures they produce. Yoshinaga-Itano and Snyder (1985), for example, discussed the most common types of assessment strategies employed in attempting to analyze the written English of deaf and hard of hearing children:

1. Computing the mean length of composition for sentences produced.

Analyzing "composition development".

Analyzing structural (syntactic) complexity.

Studying errors made in the written language samples and in categorizing them.

Counting various parts of speech within a composition.

Examining and counting grammatical transformational employed in writing.

The Maryland Syntax Evaluation Instrument is the only known standardized test for children six through eighteen years of age that exists for assessing the spontaneously written English of children who are deaf or hard of hearing (White, 1975).

Hunt (1965) successfully gave the profession a meaningful strategy for analyzing written English, namely, the T-unit, and it is this unit of analysis that has served as the primary frame of

reference for several studies (See Table 1). Hunt (1965) defined a T-unit as any independent clause with all of its subordinate clauses and modifiers. Miller (1995) believes that in assessing the language of children, the number of "words per T-unit" is one of the best measures of language competency, regardless of whether it is produced orally or through writing. Miller further argues that T-unit analysis provides teachers with an objective and reliable way to determine the relative sophistication of the written English used by their students and also affords them with a means of tracking growth in language development across time. Crowhurst and Piche (1979) have noted, however, that words per T-unit may vary depending upon the type of writing in which the children are engaged.

There has been considerable work conducted with children at various grade levels who appear free from serious language difficulties (See Table 1). When comparing the results from studies, one can see that there is not exact agreement; however, these findings can be used as a baseline for comparison.. While these studies focus primarily on analyzing (good) written language, very little has been written about how to apply T-unit analysis to "flawed English". The work of Yoshinaga-Itano, Snyder and Mayberry (1996, p.37) may be indicative of how others who have applied T-unit analysis to flawed English have addressed the issue; namely, they choose to ignore the flaws. For example, they appear to have counted 62 words in 10 sentences to compute the number of words per T-unit as 6.2. At the surface level this would seem appropriate, but when one examines the sentences used and the serious flaws within them (i.e., sentence # 2-"The man's car is crash the car", and sentence # 10-"Mike isn't woke the then and asleep."), one must question the practice of counting words without any consideration given to the syntactic quality of the word-string being analyzed. In this instance where little consideration apparently is given to the quality of English generated, it would be possible for a child with seriously flawed English to score better than a child with perfect English. The use of

T-unit analysis, without qualification, is thus brought into serious question when used with children who have seriously flawed English.

A concerted effort has been made in the Deaf Education Program at Texas Woman's University, Department of Communication Sciences and Disorders, to develop language assessment strategies that are reliable, valid and "friendly" to teachers who work with children who are deaf or hard of hearing. The underlying beliefs upon which this continuing effort has been based are that teachers (1) are in a better position to know the language of their students and test "hypotheses about language" than most diagnosticians or speech-language pathologists, (2) will derive much more meaning from the results of assessment if they are personally involved in making those assessments, and (3) have the greatest vested interest in documenting language improvement made by their students.

"Teacher Friendly Assessment Strategies" have been operationally defined as strategies that (1) can be learned by a teacher without substantial additional training, (2) can be administered as part of, or as a complement to, on-going curricular activities, (3) can be administered to students within the classroom as a group or individually, and in such a way that the students are not aware that they are being assessed, and (4) can be scored/evaluated by a teacher in less than 30 minutes per student---preferably in less than 15 minutes. The literature seems to both assume and assert that there is a "need" for language assessment (McAnally, Rose, & Quigley, 1994; Paul & Jackson, 1993; Schirmer, 1994), but what has not been available to teachers working with children with serious problems in learning English are the tools to make direct assessments in teacher friendly ways.

More specifically, over the past several years, a new strategy that meets the criteria detailed above for assessing the written language of children with seriously flawed English has been evolving through the work of White and others (See note in reference section). The

outcome of this effort has been the development and utilization of the CAWL (The Content Analysis of Written Language). The CAWL uses Hunt's T-unit as the primary unit for analysis. However, the CAWL also provides "instructions" and a "scoring form" for calculating several indices that can be used for tracking the linguistic development of students in their acquisition of English. These indices are (a) the number of T-units per 100 words, (b) the mean number of words per T-unit, (c) the mean number of clauses per T-unit (Complexity Index), (d) the mean number of morphemes per T-unit, and (e) a Word Efficiency Ratio. The last two indices are unique to the CAWL, but show considerable promise for measuring linguistic development, particularly with children who manifest serious flaws in their writing These indices can be calculated for perfect English (Level-I Analysis), for marginally-flawed English along with perfect English (Level-II Analysis) or for seriously-flawed English mixed with marginally-flawed and perfect English (Level-III Analysis). The decision to conduct a Level-I, Level-II, or Level-III analysis is left to the judgment of teachers. Their decision will most likely reflect their ability and comfort level in recognizing English structures in flawed English production as well as their willingness to give time to the process of assessment.

The first phase of development for this project involved the creation of "indices of language maturity" (those noted above) and simultaneously the development of a teacher friendly content analysis form (See CAWL Form) along with rules for scoring written English that is perfect and/or flawed. The second phase in this research project involved pilot testing the rules for scoring on textual material, as well as learning to use the analysis form. This research project has moved through the first two phases and is currently in Phase-III, which consists of pilot testing the use of the CAWL in assessing seriously flawed English. Since work is continuing into Phase-III, this paper seeks only to report that (a) the CAWL has been developed and available for pilot testing by others, and (b) that it has been used successfully to

assess the English presented in basal readers for the second, third, fourth and fifth grades. Hopefully, Phase III, which is currently underway, will successfully demonstrate that the CAWL can be used to assess seriously flawed English as well assessments of the spontaneously written English of their students, regardless of how good or flawed it may be.

Teachers of children who are struggling to acquire English should be proactive in assessing the written English of their students for the following reasons:

1. Assessments Provide Positive Reinforcement and Enhance Success. The most important and fundamental reason for developing expertise in making classroom assessments and developing a "research-minded attitude" is because it will benefit the students. Someone once said, that every time we put human behavior under the microscope of evaluation, performance goes up. In the absolute sense, this statement is probably extreme, but in principle it has merit. Certainly most people, when they know they are being evaluated, try harder to perform well, and, where there is an increase in effort, there is usually an increase in success.

   It must also be noted that there is something personally gratifying about the process of grappling with a problem and resolving it. In the case of teachers who are working with children who are experiencing serious problems learning English, it is believed that those teachers who learn how (a) how to assess what a child knows and does not know about English, (b) how to determine the rules the child is using and failing to use to produce English, and (c) how to quantify this information, will be more successful. Further, when teachers go through the process of studying, in depth, a child's production of written English, they will learn far more about the nature of the child's problems and how to resolve them than if they are simply told about the child's strengths and weaknesses by an educational diagnostician or speech-language

pathologist. In other words, the evaluative process is "instructive" in itself and much will be gleaned by teachers who go through the process, which they cannot acquire in any other way. When translated into didactic terms, it means that teachers will be better able to construct teaching situations which are efficacious in nature.

2. Assessments for "Political" Reasons. Teachers need to accept a leadership role in any IEP meeting which involves one of their students. Frequently it is in such a meeting that important decisions are made about a child's future and teachers must have data to support the recommendations they make. When there is disagreement among the members of the IEP committee, the person who has most effectively collected data and presented their case based upon that data is likely to be the most influential. Hence, if teachers wish to be influential in such meetings, they must have solid data with which to support their case.

3. Assessments to Evaluate of Programs. For many years educators of the deaf and hard of hearing have found it difficult to assess program efficacy, relative to language development. Phase-I and Phase-II of this research project have laid a foundation for utilization of the CAWL which will help educators more completely document change and growth in the development of English structure in their students.

4. Assessments Promote a Better Match Between Written Material and Learner Competencies. Over the past 20 years various forms of mainstreaming or inclusion of deaf and hard of hearing students has gained acceptability. It has been repeatedly implied that many children who are deaf or seriously hearing impaired have been and are being placed into mainstream classrooms when they are poorly prepared to be successful in such a placement (Nix, 1976; Commission on Education of the Deaf, 1988; Quigley, 1990). Thus, it is believed that one of the most compelling reasons

for teachers to use the CAWL is that it allows for direct and immediate comparison between linguistic complexity in textbooks that are being used in classrooms and the linguistic complexity of an individual child's expressive written language competence.

Purpose of Study

There were several purposes for this study: (a) to pilot-test the CAWL on basal readers to determine the feasibility of using this instrument to assess textual material, (b) to provide some normative data on T-units per 100 words and mean number of words per T-unit as a frame of reference for teachers, (c) to determine the sensitivity of the various indices computed on the CAWL in detecting differences between basal readers and within basal readers, (d) to determine the value of a new index of linguistic maturity, namely, the mean number of morphemes per T-unit (MTU), (e) to determine if there is a steady increase in structural complexity from the beginning to the end of a book, and (f) to determine if their is "relative equivalency" between published basal readers that are reportedly on the same grade level.

Methods

Twelve basal readers, published by three different, well-established publishing companies, hereafter to be referred to as Publishers A, B and C, were selected for this study. The basal readers were either recently or are currently used in the second, third, fourth and fifth grades within major school districts in North Texas. Three basal readers were selected at each grade level, resulting in levels 1, 2, and 3 for the second grade, levels 1, 2, and 3 for the third grade and so on, for grades four and five. This selection strategy was based upon the assumption that the grade levels represented differences in reading difficulty as did the three reading levels within each grade. Thus, a fourth grade reader, level 1, published by Publisher A

was assumed to be comparable to a fourth grade reader, level 1 published by Publisher B, but less difficult than a fourth grade reader, level 2, published by Publisher B. Certainly, this was a bold assumption which could be challenged. The data obtained from this study, as will be shown, only marginally supports such an assumption.

Once the 12 basal readers had been selected, each text was then subdivided, based upon the total number of pages in the book, into three equal sections. Then each third of the book was again subdivided into thirds and the middle section (core third) for each of the three sections was used for sampling purposes. Using a table of random numbers, five pages were selected from the "core third". The first 10 T-units, beginning with the first of the five pages were selected for analysis. If 10 T-units were not found on the first of the five pages, then additional T-units were drawn from the next page until 10 T-units had been selected. The T-units were analyzed using the CAWL.

Four graduate research assistants were trained to use the CAWL. To insure uniformity of scoring, each of the assistants reviewed the work of the others. When questions arose relative to scoring, they were resolved as a group and clarification and consensus were reached. Where necessary, additional scoring rules were established and distributed to the research team so that the research project could move forward with uniformity.

Results

This report is preliminary in nature. Data secured on four different grade levels for four books is herein reported (See Table 2). Tentative answers to the research questions (See Purposes of Study), will be provided based upon the data presented in Table 2.

Usefulness of CAWL. In the judgment of the research team, the CAWL proved to be a useful instrument, fully capable of being used to analyze textual material.

Normative Data. Normative data was secured on basal readers and are presented in

Table 2. If a teacher were to analyze the spontaneously written English of her/his students using the CAWL, then the data incorporated in Table 2 could be used as a general frame of reference for finding a better match between student and basal reader.

Sensitivity of the T-unit and Words per T-unit. Both the number of T-units per 100 words and the number of words per T-unit (WTU), as the literature suggest (Harris, 1995) appear to be sensitive indicators of linguistic complexity. The average T-units per 100 words for grades three, four and five manifest a predictable increase in complexity (fewer T-units per 100 words means longer sentences). However it should be noted that the number of T-units per 100 words for grade level two (12.38) was less than for grade three (12.74), a reversal of what one might predict. This may suggest that syntactically there is little difference between basal readers at grades two and three relative to sentence length which is confirmed by the similarity in WTU. Assuming differences exist between level of difficulty for the second and third grade readers. This then suggests that these differences must be in the area of vocabulary rather than structural complexity.

New Index of Linguistic Maturity: Morphemes per T-unit. It should be noted that there was a clear increase in number of morphemes per T-unit (MTU) from grade two to grade five. Not only is there a steady expansion of the MTU, but the relative size between the means is also greater for MTU than it is for any of the other indices. These data suggest that the MTU may be the most sensitive and most useful indicator of linguistic maturity. Clearly, because morphemes carry meaning, one would expect that as more free and bound morphemes are incorporated within a T-unit, there are more batches of information presented to a child (the reader) to be processed. This "increased loading of linguistic information", as coded in morphemes, is being equated with "increased complexity", and it is because the MTU reflects the number of morphemes, or more explicitly, the number of meaningful units of information

that must be processed within a T-unit by the reader, that it appears to be the most sensitive and most meaningful index considered in this study.

Structural Complexity Within Readers. The data support the assumption that there was a steady increase in structural complexity from the first to the end of the book in second, third and fourth grade readers, but this assumption was not supported for fifth grade readers. This appears to be good news for teachers working with children who need to use second, third and fourth grade readers. It does suggest, however, that writers of basal readers appear to exert less control over the structural complexity in basal readers as children get older, and assumedly, more linguistically sophisticated.

Equivalency Between Publishers. Sufficient data were collected in this study to respond to the question, "Is there relative equivalency between published basal readers that are reportedly on the same grade level?" Unfortunately, a definitive answer cannot be provided until the data are more fully studied. Preliminary readings of the data do suggest, however, that there are some notable differences between textbooks on the same grade level prepared by different publishers.

In summary, the CAWL was used to assess the structural complexity of perfect English found in basal readers. Tentative norms for basal readers grades two through five were established. The findings of this research study confirm the results of previous studies that the number of T-units per 100 words, and WTU are useful indices of linguistic maturity. Additionally, it was found that counting MTU appears to be an even more sensitive indicator.

Discussion

Having established that the CAWL can be used for assessing textual material, it remains to be demonstrated whether or not the CAWL can be used to assess the spontaneously written English of children who are struggling to master the English language and whose language is

seriously flawed. An extensive research effort is currently underway which focuses upon this research question. Preliminary data and findings suggest that the CAWL can be used in analyzing the written English of such children. If this proves to be the case, then it becomes immediately apparent that teachers, diagnosticians, etc., have it within their power to assess a child's language, and the language within textual material directly, using the exact same indices for measurement. Such assessments will then allow for direct comparisons between the two—the child's written language and the language of the textual materials being used. Engaging in such assessments that make comparisons between "text" and "child" would not prove time consuming, and would allow professionals to be much more exact in stating that a particular text is, or is not, within the "linguistic reach" of a child.

Teachers can also use the CAWL, it would seem, in trying to more precisely determine the level of structural difficulty of text material prior to using it in the classroom. Historically, teachers have been without adequate tools to help them make such judgments. In other words, if two or more textbooks were being considered for adoption as readers, a CAWL analysis might be performed on these books to determine their relative equivalence in the domain of structural complexity, as well as changes in structural complexity from the first to the end of the book. This could provide valuable information regarding which text to select for particular children. Textbook publishers themselves provide little or no information about the structural complexity of their material to teachers. They seem to focus, understandably, almost exclusively on control of vocabulary, as manifested in the nature of indices of readability.

There are some items which became apparent in using the CAWL which deserve comment. It would appear that written English that includes considerable direct discourse is much more difficult to score than running text. It may be that in sampling a text, dialogue should be avoided. Additionally, in counting morphemes the temptation to adhere to any

particular theoretical framework was avoided. Rules for counting morphemes were operationalized within the scoring procedures for the CAWL so that they might be more teacher friendly.

To be perfectly explicit, it is believed that by using the CAWL to compute the mean number of words and morphemes per T-unit, along with a standard deviation range (SD Range), etc., for any textbook, that the same exact data can be computed for any given child based upon language samples secured from his or her spontaneously written work (journals, class assignments, etc.). **Further, it is suggested that if there is no overlap between the SD range for indices being compared between a given textbook and a particular child's written language, then it could be argued that there exists a serious mismatch between that child and that text.** Clearly a decision to place a child in a classroom with textbook material that "can't be read" because the linguistic complexity is so much more advanced than their own is a very questionable practice, indeed.

Conclusion

The results of this research effort are promising. A new index of linguistic maturity, the number of morphemes per T-unit (MTU), has proven to be a more sensitive index of linguistic maturity than any other index associated with T-unit analysis. The foundation has been put in place for expansion into Phase III of this research effort which is the current pilot-testing of the CAWL with seriously flawed English .

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Table 1*
Words Per T-unit Written at Various Grade Levels*

	Crowhurst & Piche	Hillerich	Hunt	Loban
Grade				
3				7.60
4			8.6	8.02
5		10.44		8.76
6	10.13-11.75	10.98		9.04
7		11.48		8.94
8		11.65	11.5	10.37
9				10.05
10	11.15-14.26			11.79

* Miller, W.H. (1995). Alternative assessment techniques for reading and writing. New York: The Center for Applied Research in Education, p. 426

Fifth Grades

Publisher Index A Grades	Sections	T-units/100 words Means	SD	Range	Words per T-unit Mean	SD	Range	Morphemes per T-unit Mean	SD	Range	Complexity Mean	SD	Range
2	1	14.06	1.90	12.16-15.96	7.22	.98	6.24-08.20	9.15	1.54	7.61-10.70	1.34	.21	1.33-1.55
2	2	12.36	2.36	10.00-14.72	8.32	1.50	6.82-09.82	10.38	2.02	8.36-12.40	1.26	.24	1.02-1.50
2	3	10.73	1.16	9.57-11.89	9.42	1.15	8.27-10.57	11.44	1.55	9.89-12.99	1.52	.16	1.36-1.68
2	means	12.38	1.81	10.57-14.19	8.32	1.21	7.11-09.53	10.32	1.71	8.61-12.03	1.37	.20	1.24-1.58
3	1	14.63	4.33	10.30-18.97	7.32	2.09	5.23--9.41	9.30	2.51	6.79-11.81	1.54	.36	1.18-1.90
3	2	13.49	3.93	9.56-17.42	7.84	1.87	5.97--9.71	10.24	1.67	8.57-11.91	1.38	.08	1.30-1.46
3	3	10.11	1.13	8.98-11.25	9.89	1.09	8.89-11.07	12.66	.82	11.84-13.48	1.38	.30	1.08-1.68
3	means	12.74	3.13	9.61-15.88	8.35	1.68	6.70-10.06	10.73	1.67	9.06-12.40	1.43	.25	1.19-1.68
4	1	10.75	2.43	6.04-10.90	9.72	2.36	9.44-14.16	12.58	2.47	12.43-17.37	1.44	.24	1.16-1.64
4	2	10.84	3.03	7.81-13.87	9.80	2.59	7.21-12.39	12.76	3.35	9.41-16.11	1.50	.29	1.21-1.79
4	3	8.21	2.56	5.56-10.77	12.94	3.09	9.85-16.03	17.46	4.54	12.99-22.00	1.72	.20	1.52-1.92
4	means	9.93	2.67	6.47-11.85	10.82	2.69	9.50-14.19	14.27	3.45	11.61-18.49	1.55	.24	1.30-5.78
5	1	7.63	.80	6.83-08.43	13.24	1.58	11.66-14.82	17.40	2.24	15.16-19.64	1.68	.44	1.24-2.12
5	2	8.72	1.60	7.13-10.32	11.34	2.91	8.43-12.25	12.90	5.54	7.45-18.35	1.48	.22	1.26-1.70
5	3	8.86	1.47	7.39-10.33	11.54	1.94	9.60-13.48	15.94	2.87	13.07-18.81	1.56	.26	1.30-1.82
5	means	8.40	1.36	7.04-09.77	12.04	2.14	9.90-14.18	15.41	3.52	11.89-18.93	1.57	.31	1.26-1.88

THE EFFECTS OF COMPUTER-MEDIATED COMMUNICATION ON THE LITERACY OF DEAF and HARD of HEARING ADOLESCENTS

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The benefit of student-centered classroom discourse and its key components, scaffolding, and questioning, have been prime topics of research in literacy studies. All of which have been believed by many to be very crucial for language acquisition as they have fostered social interaction and critical thought. According to many linguists, children have learned language and information through dialogue as people discuss what they have experienced, read, or written (Bryan, 1996; Coles, 1995 Cazden, 1988; Feldman, 1987; Bakhtin, 1981; and Vygotsky, 1978).

Language Acquisition/Learning Theory

The psychologist, Lev Vygotsky (1978), believed that higher cognitive functions were the result of social interaction. Bakhtin (1981), a Russian language theorist, indicated that an idea was a ventriloquation of others' thoughts or languages. Therefore, a child has developed thought and language based on what others have expressed. Students have benefitted from interacting with a multitude of people and perspectives.

Vygotsky (1978) suggested that "talk" could be a catalyst for cognitive and affective change that is essential for developing thought and language. Feldman (1987) examined dialogue interactions between adults and young children. By observing the adult dialogues it allowed her to see topics being constructed from comments and hence language being built. Feldman

believed that by observing the procedures in adult discourse can give insight into the limited range found in young children.

Coles (1995) believed that teachers should build a "community of inquiry" which focuses on the development of critical thinking, problem solving, and communicating. This type of classroom would ask questions that elicit higher cognitive functioning, use scaffolding instead of direct instruction, and promote student lead discussions. Cazden (1988) discussed how classroom discourse can develop language, critical thinking skills and hence literacy.

Learning Trends

Classrooms and teaching styles often have not promoted the "environment" necessary for children to develop literacy (Miller, K. & Luckner, J., 1995). Miller et al. reported that classroom teachers rely on lecturing and are very teacher-centered. They found that 75 percent of the communication in the classroom is from the teacher (Miller et al., 1995).

There has been more pressure for students to be proficient in the academics and more curriculum constraints have been placed on the teacher. As the curriculum has been expanded, teacher talk has focused more on information and not on developing literacy. Consequently, our students have had a strong knowledge base, but they have been unable to think critically about this information. Therefore, their ability to weigh and determine perspectives has been unpracticed. True education and teaching has involved not only knowledge skills but helping students to understand and appreciate important ideas, take and defend positions, and develop a depth of understanding of a wide range of topics and questions.

Language and Literacy Perceptions of the Deaf Learner

The dependence upon the hearing culture has been a potent and involved emotional tie for the deaf person; yet, it has placed them in a subordinate position to the hearing culture that never thinks about deafness as a life experience (Erting, 1985; Schirmer, 1994). From birth and throughout

most of their educational experience, the majority of deaf people have learned from hearing people. The hearing world's view of literacy learning has served as the foundation for the educational experiences of deaf children. The results have been abysmal. Findings have indicated that the average deaf person reads at the fourth grade level (Nash, 1992, p.17). More important, this individual has suffered estrangement and isolation in formal educational settings as a result of these perspectives about how deaf people learn. As a result deaf people have had to attempt to learn in other arenas, albeit, often inadequate.

Research has suggested that the mother has usually been the primary communication partner, someone who serves as a conversation partner or interpreter, for the deaf child. Spencer and Gutfreund's (1990) research showed that there was a pattern of maternal dominance in conversational topics. Hearing Parents of deaf children had been less successful in establishing turn taking in conversations compared to hearing parents with hearing children. For example, mothers of deaf children often asked only yes or no questions. When the primary conversational partner controlled the conversation and allowed the child too few opportunities to take conversational lead, it has hindered the child's language development (Gutfreund, 1990).

Deaf children have been at risk for developing a passive style of communication in both their expressive and written dialogue. This activity has been a consequence of teachers' (Miller & Luckner, 1995) and or other adults' (Spencer & Gutfreund's, 1990) controlling interactions. Passive conversational styles have been frequently characterized by lower frequency of topic initiation and question asking.

Educators, too, under the guise of benevolence, often unknowingly hampered their students' ability to become literate. From their earliest experiences, deaf learners have been exposed to English language texts and English language instruction (Anderson, 1993). English has often been presented as a system of fragmented and discrete skills (Halliday, 1985).

For the deaf learner, this kind of instruction has been particularly devastating; there has been no spoken voice for them to make the connections of the fragments. Linguist Anderson warned, "English is not language that meets their communicative needs and physical resources; the task of mastering its use in different domains has been difficult as well as disconcerting (Anderson, 1993, p. 176)."

Interactive Journaling

Teachers have used dialogue journals to help students express themselves with written communication. In dialogue journals, personalized notebooks for students to use as a private journal with their teacher, students were not assigned a topic to write about. They wrote about anything of personal interest. The teacher did not grade or correct the writing but instead responded naturally to the students' entry. The notebooks were given back to the student so that the dialogue would continue throughout the school year. "In a successful dialogue journal, each partner will prove information, ask questions, tell stories, critique the day's events, and make complaints, requests, and promises (Bailes, Searls, Slobodzian, & Stanton, 1986, pg. 3)."

The important feature of the dialogue journal has been the teacher's response. In the response, teachers could "scaffold" the students' writing. Scaffolding writing, according to Wood, Burner, & Ross (1976), was similar to building a house. There were supports to hold up the house (teacher gave suggestions, rephrased student sentences, asked questions) and when the house was finished the supports were taken down (the student no longer needed assistance). The teacher responses/corrections were always given indirectly and in a positive manner. Furthermore, scaffolding occurred when the child interacted with a more knowledgeable peer. Increased opportunities in discourse communities have enabled individuals to form their ideas and perspectives about their environments, and they have evolved within what Vygotsky (1934/1986) called their Zone of Proximal Development or Zo-Ped. Vygotsky described this Zo-Ped as "the distance

between the actual developmental level as determined by independent problem solving and the zeal of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1938/1978, p. 86)."

In recognition of the importance of these dialogue journals and the paucity of vital interaction in a deaf child's life, many schools have begun to use written communication such as dialogue journals to help educate future teachers of the deaf and young students. Schneiderman & Wood (1996) and Strassman & D'Amore (1996) both reported on deaf and hard-of- hearing classrooms that have been writing to future teachers of the deaf. All participants felt that it was an authentic way for the teachers to learn about deafness and the students' writing ability. And the students benefited from the scaffolding interactions. One classroom has begun to write using electronic mail each week instead of hand written messages.

The use of electronic journaling may be a key component in the deaf learner's acquisition of written English. As Vygotsky (1934/1986) indicated, language development must become a social/cultural need in order for fluency to be achieved. The computer and other technologies have provided for an opportunity to fulfill this need and they have attempted to bridge the gap between deaf and hearing cultures. The World Wide Web and electronic mail have opened up many opportunities for students. Students have now been able to communicate with the world. Employing electronic mail, making writing English a visual, easily accessed mode of communication has heightened its' appeal to the deaf learner.

Trent Batson (1988), a former professor at Gallaudet University, used computer written dialogue journals. He found that his students wrote more using the word processor. The text was more eligible and the disks were easier to carry around than a stack of notebooks. Wang (1996), an English as a second language researcher, looked at dialogue journals via the Internet. He studied the language functions in both e-mail journals and paper journals.

The Purpose of this Study

There has been extensive research on dialogue journals and the positive impact it has on learning and using written English. Linguists and researchers have proclaimed that classroom discourse and dialogic interaction has led to literacy and language acquisition. By literacy of course, we have meant, more than the ability to encode and decode written English. We have meant literacy as a power to communicate and to think in a language. Literacy, according to Gee (1991), has been the ability to gain fluency in a language and to recognize the contexts and values that give a language power. The opportunity to become literate has allowed people to participate in a cultural community and to develop the ability to think and shape their lives.

Research Question

Therefore, it was the purpose of this pilot study to examine if hard of hearing, middle school students develop their written literacy skills (thinking critically and writing in English) when discussing a common reading via the Internet.

Research Design

The research design chosen was a qualitative case study. Studying a classroom and examining writing artifacts can best be assessed in a naturalistic setting. Rist (1982) described qualitative research one which " seeks to study people where they are and as they go about their normal routines (p.442)." It seemed essential to study the participant in the most natural setting in order to capture the true essence of students' writing. Therefore this study was conducted in the everyday occurrence of a classroom setting. The study was woven into the curriculum.

The Participants

The eight participants were in a middle school that served eight districts in rural northwest, Ohio. The students were all in a self-contained classroom and had been instructed in Signed Exact English (SEE) since preschool. The students interacted once a week with the E-mail teachers, a

professor in English at Gallaudet University and a graduate student in Deaf Education at Bowling Green State University. The students were all Caucasian and had a moderate (50dB) to profound loss (80dB).

The students were asked to write once a week to the "more knowledgeable peer" via the Internet. The students began the interactions one at a time on the classroom computer. The students were allowed to write for an unspecific amount of time with little instruction from the classroom teacher. Time became a limitation and soon the students were sent down to the school computer lab to write their responses and save them as a document. (It should be noted that the school computer lab was not connected to the Internet.) The students had to copy their document to the classroom computer and it was sent by electronic mail.

The students were questioned in the electronic journals about the books that were read aloud in class. A common reading was used to procure critical questioning skills and cognitive thought. The teacher used scaffolding (repeating, modeling, questioning, guiding, and encouraging) to respond to the students' questions and responses.

Collection of Artifacts

For this pilot study, the primary artifacts were the transactions of the students and E-mail teachers. As a means of triangulation, written transactions, teacher journals, student interviews, and class observations were used to report findings and or common threads. The researchers observed the participants during each week's interactions, studied and coded the written transactions, and conducted student interviews.

The Artifacts Revealed

Perceptions of Literacy in English and SIGN: ASL

When asked to define literacy, generally, the participants all responded in the same manner. All students indicated that good English meant good speech, thus reflecting their oral

training and an echo of teachers from his past. When asked if reading and writing were a part of good English, students replied, "No." The power they assigned to this kind of literacy was a reflection of the language instruction they were exposed to, and how this instruction tailored their view of their literacy abilities. The participants' answers were a ventriloquation of their past teachers' and parents' concepts of language and literacy learning (Bakhtin, 1981). They felt that literacy was good speech or, at best, fluency in reading and writing in English and that to possess literacy would enable them to find a job. Repeatedly, the participants viewed the goal of reading and writing was to "get a good job."

When asked about sign communication (there was no distinction between ASL and SEE for this study. Most students had only been exposed to the code system SEE. ASL was not a comprehensible language for them.) Two students indicated that they did not like sign. Others stated that sign made communication clearer. None of them saw literacy in sign as a goal. Sign merely reinforced spoken English analyze their worlds in English and ASL was beyond the scope of understanding of most of the participants. For them, literacy involved a formulaic system of reading and writing to be memorized. This view of literacy was the goal of their education, albeit an unobtainable goal for some.

Deaf learners' language abilities have been evaluated in terms of phonological, morphological, and syntactic rules; therefore, they have been unable to see the relation of language to meaningful conversation (Anderson, 1993). As a result, they have determined their own language as insufficient. These views of literacy and its purpose were a reflection of the famial, societal, and educational experiences of the participants. These students viewed literacy as language fluency in spoken English only. There was no mention of being able to think in a language.

Perceptions of Teaching/Learning

These students had a clearly defined understanding of their roles as students. Interaction

and questioning were not a part of the learning process. When asked why they did not question their teacher, after three months of electronic mail messages, students responded candidly. "We are supposed to answer the questions you ask," and "You are the teacher," indicate that students have been taught not to question their teachers and/or they are not practiced in critical questioning strategies. Nonetheless, some students began to unravel their past ways of "learning" and to take risks in this electronic learning community. Some students began to ask the teacher questions; however, the topics were mainly restricted to everyday events and not the story or class assignments. Students chatted about sports, family, and friends. They asked the teacher about her events for the weekend, her family, Gallaudet University, and Washington DC. The questions were always at the memory level of who, what, where, when, why, or how. The students' interaction did not reflect critical literacy, but rather, learned patterns of conversational chat.

Regardless, a few of the learners began to benefit from the interactive experiences. Two students attempted to "try-on" new language. On 9/12/97, Randy talks about football. On 9/12/97, the teacher discusses one of her students who plays football and now has an injury. Randy attempts to use the new vocabulary word on 9/19/97; "we played the waoka team they were big and veay storg we had about five people injury."

On 9/10/97, the teacher wrote that she thought the two characters in the Full Moon stories were very clever. She asked if Tommy knew anyone who was clever? On 1/17/97, Tommy did not respond to her question, but he used the new word "clever" in a sentence. "I kown a move is clever is all dogs go to heaven. Have you ever wach it." On 9/17/97, the teacher repeated the use of clever, "All Dogs Go to Heaven is a clever movie. Why do you think it is clever?" Tommy, however, did not engage in the interaction. Instead, he opted to discuss the next topic in the class in his next message. Yet, when Tommy 11/10/97 described that tepees were made of 30 buffalo hides, he asked the teacher, "How do you feel about that?" This initial attempt at questioning was important.

Tommy leaped beyond basic what, where, who memory questions and posed a value question to the teacher. He was beginning to try out his power in written English.

Further, one student, Sandy, made several grammatical errors in her comments. "At my hurse we are geting a new girl and I do not known her name is at all." When the teacher asked her to clarify her statement, she corrected her statement and expressed her metacognitve awareness of language learning. "My mom did not have a baby but my mom's sister name terrah andthat isher baby. I am leraaned about langauge."

These attempts were small gains in interactive language learning and may have reflected the lack of critical thinking instruction and experiences of the students. Other factors influenced student participation, as well. Using electronic mail was a novel experience for these learners. Some students enjoyed the new method. "Thank you for tying me alot," and "I lie to type on the computer" indicated enjoyment in the process. While students eagerly anticipated the arrival of the teacher responses, there were some complications. Some students found typing to be burdensome. Of the eight students, six complained about typing. Many of the students noted, however, that they like to use the computer and that they used a TTY. Justin, on 1/9/98 revealed his enjoyment and frustration with these electronic interactions:

> I think we hear about the e-mail and we want fun to do and maybe we can use the video [to sign to each other on the computer]. And if we can talk to each other. But we [need time] to think about the your answer and we can try our question.eet and we listen to you and we have to follow the direction. Thank you for the e-mail. But oher peple want ot use the e-mail to us and the kids.

Further investigation revealed that they only had one computer in the classroom. Time was limited. (This problem was remedied by taking to students to the computer lab and letting them compose their responses on a disk. The letters were then downloaded. Students then had more time and the benefits of a word processing program.). Students expressed that answering teacher questions was like homework. When asked if they chatted with anyone in conversation they all

replied, "Yes". When asked if they felt they could learn from these conversations with fathers, grandfathers, or friends they replied, "Yes". When asked if they chatted with teachers, they said, "No." (Perhaps their notions of responding as opposed to interacting with the teacher interfered with their eager participation in this study.)

Conclusion

"[A] person is literate to the extent that he is able to use his language for social and political reconstruction (Walmsley, 1981, p. 84)." It should be the responsibility of schools, teachers and parents to discover ways to help produce educated, literate students. The participants have been an example of how the system has been depriving them of their freedom of voice. It was not because they were deaf that they could not communicate critically in a language, but instead, it was perhaps the repeated, past experiences of focusing on mechanical structures of writing and teacher control. They have shown that they lack the understanding of what literacy is and how they can use it to build knowledge.

These findings as revealed in this pilot study lead us to important questions for the continuance of this research study. How do we enable deaf and hard-of-hearing learners to understand literacy is power in a language? How do we foster learners' questioning and critical thinking? How do assist learners to unravel past experiences? How do we encourage learners to take risks?

The study will continue with the following changes; 1) more interaction with the common reading, and 2) more direction, possibly by mini lessons, on what to look for in the e-mail teachers' responses.

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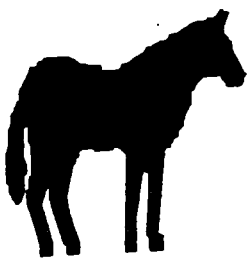


ASSOCIATION OF COLLEGE EDUCATORS OF THE DEAF AND HARD OF HEARING 24TH ANNUAL CONFERENCE MARCH 6-9, 1998 LEXINGTON, KENTUCKY

ACTION RESEARCH: FOCUS ON THE CLASSROOM

FRIDAY, MARCH 6

1:00-4:00 Preconference Workshops

Enhancing Student Performance Through Classroom Assessment Techniques
Vicki Robinson & Keith Mousley, NTID, Rochester, NY

Using Computer Graphics to Add Excitement to the Teaching/Learning Process: Introduction to Microsoft Power Point
Alan Marvelli, Smith College

4:30-6:30 ACE-DHH Executive Board Meeting

5:00-6:30 Conference Registration

6:30-8:00 Reception and Opening Comments-Sign up for an Interest Group

SATURDAY, MARCH 7

7:30-9:00 Interactive Demonstrations and Breakfast Sponsored by NTID

TTY Pen Pals Project: A Public School/University Joint Program
Ruth Fletcher-Carter & Victor Vodounou; New Mexico State University, Las Cruces, NM

The Hopewood Case: Its Effects on University Teacher Training Programs in Deafness
Tony Martin; Lamar University, Beaumont, TX

The Effects of Computer-Mediated Communication on the Literacy of Deaf and Hard of Hearing Adolescents
Marsha Jones, Karen Kimmel & Susan Brooks; Bowling Green State University, Bowling Green, OH, Gallaudet University, Washington, D.C., & Kent State University, Kent, OH

Reading Strategies: What Deaf Students CAN Do
Sandy Bowen; University of Northern Colorado, Greeley, CO

Some Current Literacy Practices That Are Working
Henry Teller: University of Southern Mississippi, Hattiesburg, MS

Teacher-Friendly Language Assessment Strategies
Al White & Paula Scott: Texas Women's University, Denton, TX

9:00-10:30 Opening Session: *Judy Egelston-Dodd*, President

Keynote Address: Improving Classroom Dynamics Through Action Research
Keith Mousley & Vicki Robinson; NTID, Rochester, NY

10:30-11:00 Break and Small Group Discussion (Sharing Action Research Ideas)
Discussion Group Leaders:

Rachel Friedman	Alan Marvelli	Barbara Strassman
Azar Hadadian	Susan Shroyer	Katharine Stephans-Slemenda
Paul Crutchfield	Al White	Suzanne Rosenberg
Bill Brelje		

11:00-12:15 Business Meeting I: *Judy Egelston-Dodd*, President

12:30-1:45 Lunch on Your Own: Join an Interest Group

2:00-4:45 Panel Discussions/Roundtables

2:00-3:15 A. Moderator: *Ruth Fletcher-Carter*
A Pilot Bachelor of Education Program for Deaf Candidates
Neita Israelite, Sheila Flood, Darcie Avram & Christine Ehrlich; York University, Toronto, Ontario, Canada & Sir James Whitney Provincial School, Belleville, Ontario, Canada

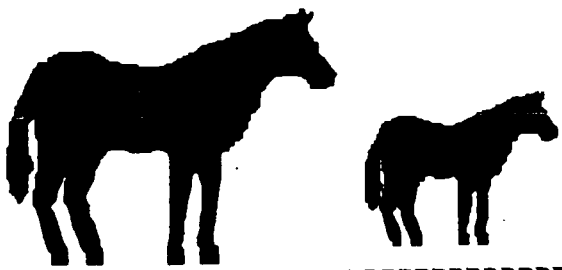
B. Moderator: *Dave Dolman*
Teacher Preparation & Collaboration Between General & Special Educators
Martha Gaustad & Shirin Antia; Bowling Green State University, Bowling Green, OH & University of Arizona, Tucson, AZ

3:15-3:30 Break

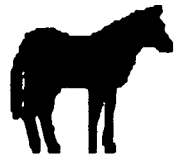
3:30-4:45 A. Moderator: *Sam Slike*
NCATE-CEC-CED: Three Endorsements, One Program Review
Harold Johnson, Pat Bockmiller & Tom Jones; Kent State University, Kent, OH, Southern University, Baton Rouge, LA, & Gallaudet University, Washington, DC

B. Moderator: *Pam Luft*
An Investigation of the Itinerant Service Delivery Model for Children Who Are Deaf and Hard of Hearing
Kathryn Kreimeyer, Rachel Friedman, Anna Murray, Serife Akbogur, Kelley Green, Cheryl Wilder, Michelle Brothers; University of Arizona, Tucson, AZ

5:00 Evening on Your Own



SUNDAY, MARCH 8



8:00-9:00 Workshops/Demonstrations

A. Moderator: *Sandy Bowen*
Speechreading Challenges on CD-ROM
Samuel Slike; Bloomsburg University, Bloomsburg, PA

The Effects of Three Reading-Aloud Strategies on Middle School Deaf and Hard of Hearing Learners
Susan Brooks; Kent State University, Kent, OH

B. Moderator: *Freeman King*
Students as Synthesizers and Evaluators of Web-based Instructional Units
Pam Luft; Kent State University, Kent, OH

Students Learning to Write; Teachers Writing to Learn
Barbara Strassman; The College of New Jersey, Ewing, NJ

9:00-10:00 Continental Breakfast Sponsored by Joseph-Beth Booksellers

10:00-11:00 Workshops/Demonstrations (5 minute break after presentations)

A. Moderator: *Sandy Bowen*
A Conceptual Framework for Deaf Education: Two Approaches to English Literacy
Steve Nover, Pam Shaw, & Susan Dickman; NMSD, Santa Fe, NM, KSD, Olathe, KS & Littleton, CO

B. Moderator: Freeman King
Using Students' Writing Experiences in the Classroom
Nora Shannon & John Albertini; NTID, Rochester, NY

ASL as a Primary Language of Research
David Mason; York University, Ontario, Canada

11:05-1:05 Workshops/Demonstrations/Contributed Papers

A. Moderator: *Ed Shroyer*
Development of Practical Knowledge and Pedagogical Expertise in Teachers of Deaf and Hard of Hearing Students
Edward Marlatt; Gallaudet University, Washington, DC

Beginning Teachers of Deaf and Hard of Hearing Students: Professional Concerns
Simon Guteng; University of Arizona, Tucson, AZ

Co-teaching: Research on Social Interaction
Thomas Kluwin; Gallaudet University, Washington, DC

Deaf Students' Perceptions of Schooling
Pamela Luft, Susan Brooks & Suzanne Rosenberg; Kent State University, Kent State, OH

B. Moderator: *Deb Stryker*

Using Action Research for Program Evaluation
Susan Lenihan; Fontbonne College, St. Louis, MO

Including Competencies for Itinerants in Teacher Preparation
Carolyn Bullard & William Brelje; Lewis & Clark College, Portland, OR

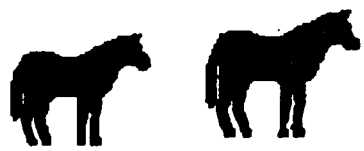
Pre-service Teachers' Attitudes Towards Inclusion
Azar Hadadian & Joan Studnicky; Ball State University, Muncie, IN

Our Action Research Requirements for Student Interns: Challenges and Issues
Kathleen Warden; University of Tennessee, Knoxville, TN

Problem-solving Strategies for Deaf Students
Ronald Kelly; NTID, Rochester, NY

1:15-5:00 Time to Explore Lexington (Shakertown, Horse Farms, Mall, etc.)

5:30-9:30 ACE-DHH Banquet and Entertainment
Kentucky Horse Park



MONDAY, MARCH 9

9:00-9:45 Business Meeting II: *Judy Egleston-Dodd,* President

9:45-10:00 Break

10:00-11:30 Workshops/Demonstrations

A. Moderator: *Karen Dilka*

Constructing Inclusive Classroom Models that Serve Deaf and Hard of Hearing Children
Deborah Haydon & Karen Dilka, Eastern Kentucky University, Richmond, KY

B. Moderator: *Barbara Schirmer*

Using Writing Assessment Rubric for Motivation and Support of Deaf Students
Barbara Schirmer & Jill Bailey; Kent State University, Kent, OH

11:30 Adjourn

11:30-2:00 Executive Board Meeting: *Mary V. Compton*

Interpreters:
Tammy Cantrell, Artie Grassman, Laurence Hayes, Bernadett Mayhall, Nick Osborn, Karen Petronio, & Rita Zirnheld

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