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ABSTRACT

These three conference papers from the Biennial Conference on Postsecondary Education for Persons who are Deaf or Hard of Hearing focus on campus support services for individuals with deafness or hard of hearing. The first paper, "Realtime Captioning: Access Equals Success" (Harlene Rosen and Sandy Eisenburg), describes the services provided by the National Center on Deafness and the benefits of realtime captioning in classrooms and other campus venues. The second paper, "What Is a Qualified Interpreter. . .and How Do I Get One" (Debra C. Brenner and Bruce D. Finkbone), examines the definition of "qualified interpreter" as outlined in the federal regulations and proposes a model for interviewing and assessing interpreters. Interpreter profiles, media resources, sample questions, and assessment forms are included. The final paper, "Computer Speech Recognition as an Assistive Device for Deaf and Hard of Hearing People" (Joseph Robinson and Carle Jensema), describes how computer search recognition can be used by sign language interpreters as an assistive tool to provide more complete interpreting for students with deafness and hard of hearing in mainstream classes. (Some of the papers contain references.) (CR)

Enhancing Support Services

Conference Proceedings
1996

Challenge of Change: Beyond the Horizon

Seventh Biennial Conference on Postsecondary Education for Persons who are Deaf or Hard of Hearing, April 17-20, 1996, Knoxville, TN

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Realtime Captioning: Access Equal Success

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What is Realtime? What does it do? Who uses it? Who benefits from it? What does it cost? What's in that black case? We hope to answer all these questions and more in today's presentation. We would also like to briefly tell you where we are from and the mission we are charged with in support of students who are deaf and hard of hearing.

The National Center on Deafness (NCOD) is a model comprehensive support service program for deaf and hard of hearing students enrolled in an integrated setting. Its primary goal is to make all university services fully accessible to this population. Support services include interpreting, notetaking, tutoring, counseling, career development and placement, assistance to faculty and staff who work with deaf individuals, and most recently, Realtime captioning in classrooms and other campus venues. We have captioned meetings for Brenda Wilson, President of California State University, Northridge and also for President Bill Clinton when he visited our campus after the 1994 earthquake.

Today NCOD provides support for approximately 250 students who are deaf and hard of hearing, more than any other mainstream campus in the United States. In addition, NCOD responds to over 300 calls per week requesting information on deafness, support services, higher education and many, many calls about Realtime captioning.

Staff and students at NCOD realized that not everyone in the classroom was benefiting from traditional services such as interpreting and notetaking. Alternative solutions were sought, and Realtime captioning appeared to be another option in meeting these needs. We have been using Realtime in the classroom since 1992, and its growth has been unprecedented. A video illustrating the use of Realtime in and out of the classroom was included as part of the conference presentation.

Realtime began at CSUN in the fall semester of 1992 in one class, three hours of service weekly, with one captionist -- Sandy Eisenburg. The student response has been phenomenal, and Realtime currently serves over 160 classroom hours per week with new requests coming regularly.

In August, 1994 NCOD hosted a seminar in academic Realtime captioning. The response was outstanding, with over 200 participants in attendance. Consequently, we began our Realtime training program in January 1995 and currently employ 11 hourly captionists and a Realtime coordinator. A sample training outline and schedule are available from the authors. The training program has been quite successful, and we

are often complimented on our captionists' precision, professionalism, and quality of their work, as well as their friendliness.

Equipment used for classroom Realtime consists of a court stenograph machine linked to an IBM-compatible laptop computer. Software used is RAPIDTEXT and WordPerfect 6 for DOS, which allows control of font size, style and color as well as student access through the computer keyboard at the same time the captionist is hooked through the stenograph. We also hook up to TV's using an inexpensive VGA to TV converter, allowing many students to view. Other devices, options, and specifications are also available from the authors.

Realtime captionists stenographically record all classroom proceedings, including lecture and student commentary. Students are usually identified as male or female student, although proper names may be used to identify speakers as well. Special notations are used as indicators to prompt students to look at a chalkboard or large map or to show when the professor is demonstrating something. We include blurbs such as "laughter" so our students will get the flavor of what is happening. And if there is an uncaptioned film shown or no decoder available, we will caption what is said on that film (although these captions will not imprint on the film itself; that is a different process).

Students are responsible for bringing diskettes to our student copy center where a hard copy is printed out after class and distributed to the students who are deaf and hard of hearing. These notes are also used by professors to help prepare their lectures and by interpreters, notetakers, and tutors to provide technical vocabulary and class information for tutoring sessions. A pilot classroom note sales program for hearing students in classes already served by Realtime has been initiated by the University through the Associated Students organization. In addition, computerized or hard copy is available for captioning of any event, and many times this eliminates need for a secretary to take handwritten notes.

Because Realtime is a dual service, providing both instant display of the spoken word and a hard copy of proceedings, we can usually use a captionist to substitute for an interpreter or a notetaker or sometimes both. Additionally, captionists are generally able to work for a longer period of time than interpreters. Given one 20-minute or two 10-minute breaks, captionists are able to work in classes up to three hours in duration. Realtime can also be transmitted remotely to other locations via modem connection. With all these uses and options, one can see that Realtime can be a very extensive and cost-effective service.

You are probably wondering who gets Realtime services in the classroom and how classes, Realtime captionists, and students are matched. Providing the service that a student requests in the classroom begins late in the previous semester. Registration for the fall semester usually occurs in May of the previous spring. Students meet with an NCOD counselor and fill out a schedule of classes. Their classes are listed on *WIWC* cards (Who's In Which Class). At this time the counselors and students decide if Realtime captioning is their choice for some or all of their classes. We strongly suggest to students who really benefit from Realtime to

request it at registration time in order to ensure filling their request. Services are color-coded on the *WIWC* cards and yellow is the color we have designated for Realtime service.

Sometimes it is obvious to the staff that Realtime Captioning will be needed for a very oral student who does not sign or a late-deafened individual who is not yet comfortable in any communication mode. Some students know nothing about Realtime and are exposed to it here in a class where another student requested it, and suddenly a whole new world of understanding is opened up.

There are no hard and fast rules about who gets Realtime. Some students may request it after the semester begins, especially in a very technical class where words are long and difficult to spell. Once a word is entered in the captionist's dictionary, it will generally always be spelled correctly. We have found that very, very few students give up Realtime once they have it in a class. At the NCOD we work together as a team, so anyone in any department may see that a student is not progressing with traditional service and may suggest Realtime as another *access to success.*

For some students, Realtime has made the difference between success and failure. Having equal access to information, commentary, and the repartee and joking which are a normal part of everyday classroom activity opens up the university to these students, and they are able to interact and be a part of the class. Realtime gives them the opportunity to excel, and this has been reflected academically in their grades, as well as in some students' demeanor, attitudes, and even the way they dress and carry themselves.

Evaluation of Realtime captionists by students occurs every semester at about the midterm point; to date, the response has been overwhelmingly positive. We have found that the great majority of students who have had Realtime request it for future classes. As the Realtime coordinator, Sandy also observes the captionists from time to time, reviews their raw notes, and gives an evaluation. In general, our captionists produce excellent work and are continually improving. They appreciate the atmosphere of support we offer and truly enjoy serving our students.

Of course, Realtime is not a flawless communication method, nor is it a panacea. One drawback occurs when serving non-oral students. Since most captionists are not fluent signers, these students must type on the computer keyboard or write notes for the captionist to voice. However, since we have such a large deaf student population at CSUN, some of our classes are also served with an interpreter. We do have some non-oral students who request Realtime because of the extensive vocabulary it provides. If funding is available, NCOD plans to purchase additional laptop computers to allow more students to individually hook up to the captionist's computer, thus expanding interactive potential.

There is always the possibility of equipment failure. If this happens, our captionists will take handwritten notes. We try to keep extra equipment on hand in case such a problem arises. It is also very important for providers of Realtime services to have technical support readily available for hardware, software, and video technology.

For labs or extremely diagrammatic, demonstrative, or contextual classes, Realtime may not be the ideal service because it is literally text on screen. However, sometimes these classes work out better than expected; it really depends on the individual class and student. Realtime notes can be very long because they are a complete record of classroom proceedings and not a condensation or outline of main points. They contain all the material, both extraneous and essential, and some students complain about this. However, many students are able to take their own abbreviated handwritten notes from the Realtime screen. Some students actually view this as an opportunity to learn a new skill, notetaking, which they were unable to do themselves using an interpreter or lipreading.

At the National Center on Deafness, we see a very bright future for Realtime captioning and its many uses. Service requests are always increasing. In our future outreach activities, we will attempt to contact more learning institutions through the distance learning center at California State University, Northridge's Oviatt library and will provide Realtime workshops as well.

What Is A Qualified Interpreter . . . And How Do I Get One?

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Abstract

The recent passage of the Americans with Disabilities Act (ADA) brings the issue of disability access to the forefront at institutions of higher education. An emerging group of students with disabilities on college campuses today is students who are Deaf. Although there are several institutions that have a specific charter to serve Deaf students, these students are now applying to colleges and universities that have never before had a Deaf student enrolled. All institutions of higher education, whether or not they are "specialized" colleges for the Deaf, are required to provide accommodations that will meet the communication needs of student who are Deaf.

To assure equal opportunity to all programs and activities, institutions are required to provide what the ADA refers to as "auxiliary aids." The ADA specifically recognizes the request for a sign language interpreter as an auxiliary aid and defines a "qualified interpreter" as "an interpreter who is able to interpret effectively, accurately, and impartially both receptively and expressively using any necessary specialized vocabulary." Due to the national shortage of qualified interpreters and the high demand for their time, service providers are struggling to find qualified interpreters to meet the needs of students at their institutions who are Deaf.

The purpose of this paper is two-fold. One goal is to examine the definition "qualified interpreter" as outlined in the federal regulations. State and national certification does not necessarily imply that the interpreter is competent in the classroom. Many hold credentials but still need to be evaluated to see if they have the experience and skills to satisfy the definition of "qualified interpreter." By the same token, there may be interpreters who have adequate skills but lack the credentials. A process is needed to identify and assess these individuals.

The second goal of this paper is to propose a model for interviewing and assessing interpreters. Rather than relying on non-standardized state assessment instruments and self-reported past experiences and skills, the presenters propose an alternate means of determining qualifications of interpreters.

Other questions the authors will consider include: Is the educational institution meeting the ADA requirements by hiring someone who can sign, but not interpret? How does reasonable accommodation fit into the picture?

In summary, the paper will both define "qualified interpreter" as it applies to the postsecondary setting and provide a model for interview and assessment of potential service providers and staff interpreters.

* * * * * * * * *

The University of Georgia's Office of Disability Services has been providing interpreter services to students who are Deaf for many years; however, in 1993 five staff interpreter positions and a Coordinator of Interpreter Services were approved and added to the existing professional staff. With this addition came the concerns about: 1) how to determine which interpreter qualifications are essential for the needs of the student population that utilize sign language interpreters and, 2) once these criteria have been established, how to locate qualified applicants for those positions.

Numerous definitions of "qualified sign language interpreter" exist. The Americans with Disabilities Act, the National Registry of Interpreters for the Deaf, Inc., and the Georgia Registry of Interpreters for the Deaf, Inc. have all proposed definitions of "qualified interpreter." Many other definitions have been developed, but all vary to some degree.

Before delineating those applicants who may be "qualified," it is important to first determine who may not be appropriate for your consideration. Many students entering college are products of mainstream, public school programs. Often these students utilize a signing system other than American Sign Language (ASL). The skills of the interpreter must meet the needs of the student population. It is therefore imperative that interpreters providing services to these students have the capability to *transliterate* which is taking the spoken message and rendering it in an English-like fashion *and* recognizing a message signed in a more English-like manner and voicing it in appropriate English.

It is often assumed that individuals from the following categories have appropriate skills to interpret in an educational environment. The categories include: 1) Children of Deaf Adults (CODAs), 2) graduates from Interpreter Training Programs (ITPs), 3) family members of the student who is Deaf, 4) students of American Sign Language, and 5) persons who possess a Quality Assurance level (a state level interpreter assessment).

It is often assumed that a CODA, whose parents are Deaf, is innately qualified as an interpreter. However, both parents may be products of the state residential school for the Deaf, be active within the local Deaf Community, and possess American Sign Language as their language of choice. The CODA may grow up with little or no exposure to any of the signed codes for English. Although these individuals *may* have the sophisticated skills of signing and *interpreting* (the ability to relay information between two very different languages - ASL and English), they may have no competence with transliteration.

The majority of Interpreter Training Programs are two-year programs (some are of lesser duration) and offer an Associate of Arts degree in Sign Language Interpreting. As with any other language, two years is not a sufficient amount of time to master both the language and acquire the skills and knowledge necessary to interpret/transliterate using that language. Upon completion of a recognized ITP, graduates are considered to possess a minimum level of proficiency and *may* be ready to work under the tutelage of an experienced interpreter.

While family members may possess the interpreting/transliterating skills required by your students, it is suggested that interpreters not be placed in situations that could possibly compromise ethical behavior. Having one's

relative present in the postsecondary academic setting may prove to be detrimental to both the student who is Deaf as well as the interpreter.

Individuals who enroll in American Sign Language classes are extremely eager and motivated to put themselves in situations where they are "interpreting" in order to "help out." As previously stated, however, to become proficient in another language requires years of commitment. In addition, ASL students must practice, not only with their hearing classmates, but within the Deaf community. Unfortunately, the misconception that a sign language student equates with an interpreter still exists. For example, in a recent week-long workshop for currently working educational interpreters in the public schools, a survey was taken to determine qualifications and professional preparation of those in attendance. Those attending the conference reflected a cross-section of interpreters working in public schools. It was discovered that approximately 80% of working interpreters had no more than two sign language classes prior to beginning their careers as educational interpreters.

The Quality Assurance (QA) state level interpreter assessment is a measure of interpreting/transliterating skills that tend to be somewhat less stringent than the evaluation offered by the national Registry of Interpreters for the Deaf, Inc. States that currently utilize the QA process often develop the testing procedures, materials, and criteria independent of other interpreter assessments. It follows that the level of interpreting/transliterating skill reflected in a Level III awarded in one state may be equivalent to a Level I in another state. One's level of measured interpreting proficiency should not be accepted blindly. Rather, all applicants should undergo an in-house assessment of interpreting/transliterating competence.

Determining Qualifications

Applicants for the position of staff interpreter at the University of Georgia are interviewed and assessed by the Coordinator of Interpreter Services and a Disability Specialist who are both nationally certified by RID. The principal evaluator, the Coordinator of Interpreter Services, has received training at both the state and national levels to evaluate both interpreting and transliterating proficiency. Materials utilized during the skills assessment part of the interview are of two kinds; some are produced in-house while others are obtained through distributors of sign language/interpreting books and videotapes.

A ready supply of assessment materials can be obtained fairly easily by arranging with professors and instructors to audio-tape classroom lectures and discussions. These recordings, in turn, can be employed during the skills assessment segment of the interview process. Additionally, current staff interpreters should be encouraged to incorporate these same tapes into their skills enhancement activities.

In seeking qualified individuals to provide interpreting services to students who are Deaf, there are additional characteristics that are essential for staff interpreters to possess.

Stamina – How long can one interpret at a given time without compromising the content of the interpreted message and/or developing Overuse Syndrome or Carpal Tunnel Syndrome? A recommended maximum of twenty five hours of in-class interpreting per week has been established at the

University of Georgia. This number includes situations in which the interpreter is working alone as well as situations where there is another member of the interpreting staff assisting which are referred to as teamed situations.

Flexibility -- How capable is the interpreter at going into new situations and performing both professionally and with the desired level of proficiency? At times, due to illness or other conflicts, an interpreter may be asked to interpret a class that is not part of his/her regular schedule. Does the interpreter possess the interpreting/transliterating competence to enter a new situation, often at a moment's notice, and relay information accurately and appropriately?

Attitude -- Many applicants may come from a freelance interpreting background. Freelance/independent interpreters might have enjoyed the luxury of being able to accept and reject assignments based on particular interest and/or monetary need. In the capacity of freelance interpreter, the individual acts as his/her own "boss" and manages his/her own time and schedule. The adjustment to becoming a staff member with a supervisor can be overwhelming for some and this point should be discussed openly during the interview.

Interpersonal Skills -- Working as a staff member, it is essential that applicants possess the ability to work cooperatively with other professional staff within the Office as well as other staff interpreters in a team interpreted situation. Additionally, because our program is relatively new, most professors have never experienced having a student who is Deaf and an interpreter present in the classroom. This situation requires the interpreter and/or Disability Services staff to adequately explain the interpreter's function within the classroom setting and to overcome possible pre-existing attitudes and/or stereotypes.

Knowledge -- While we can all be reasonably assured that an interpreter at the elementary level possesses knowledge in the areas of study at this level such as primary colors, basic geography skills, fundamental principles of science and mathematics, the course content at the postsecondary level is as varied as the number of students enrolled in these courses. The sign language interpreter/transliterator must often be aware of current world events in general, be knowledgeable of current of political events and leaders, and be aware of new economic trends. While the additional duties often assigned to interpreters in the public schools decline, an increased responsibility for course content occurs at the college/university level (refer to Figures 1 and 2).

Interpreter Profiles

The interpreter profiles (refer to Figure 3) illustrate the similarities as well as the differences in criteria utilized when hiring qualified individuals. Each candidate was interviewed and thoroughly assessed for sign-to-voice and voice-to-sign interpreting and transliterating (refer to Figures 4 and 5). Each applicant was determined to be qualified to provide interpreting and/or transliterating services for students who are Deaf.

Before "qualified" can be satisfactorily determined, the following areas warrant careful examination. Of primary importance is the number of classroom hours to be interpreted and how those hours are blocked, including consecutive classes or those staggered throughout the day. Other areas to consider include: a) the number of students requiring interpreting services, b) the level of involvement of Deaf students with extracurricular activities, c) the particular language preference(s)/communication style(s) of students who are Deaf, d) course content, e) level of difficulty of particular course, f) the rate/speed of delivery within individual classes, and g) the educational level of applicants. By assessing these areas, you can better determine not only the number of interpreters necessary to provide quality services, but which interpreter characteristics will best meet your program's unique situation. Once these particular aspects have been defined, appropriate personnel can be sought, assessed and, if suitable for your specific needs, be employed.

Programs that do not have professionals with sign language interpreting and skills assessment expertise should contact one of the professional organizations and agencies from the list located in the Appendix. This resource is provided to aid you in contacting specialists who may assist with interpreter evaluation and interview procedures.

Media Resources

Below are listed some possible resources that may assist you in the evaluation process of potential educational interpreters.

Sign Media, Inc.
Burtonsville Commerce Center
4020 Blackburn Lane
Burtonsville, MD 20866-1167
Phone: 800 - 475-4756 (V/TTY)
FAX: 301-421-0270

Live at SMI - series of six videotapes of Deaf individuals signing a variety of stories

Sign Enhancers
1320 Edgewater NW
Suite B10, Room C2
Salem, OR 97304
Phone: 800 - 76-SIGN-1 (V/TTY)

Still More Deaf Children Signers! - ages 13 to 18 years

Sign-to-Voice series (tapes 4A, 4B, 4C, 4D, 4E, 4F) - each videotape consists of a different Deaf adult signing an array of stories

Deaf Culture Autobiography series (tapes 8A, 8B, 8C, 8D, 8E, 8F, 8G, 8H) - description similar to above series

Figure 1

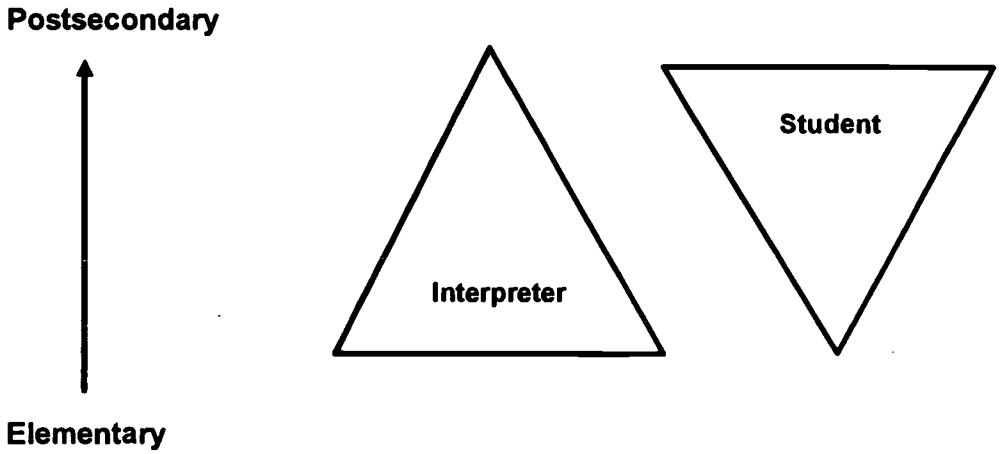
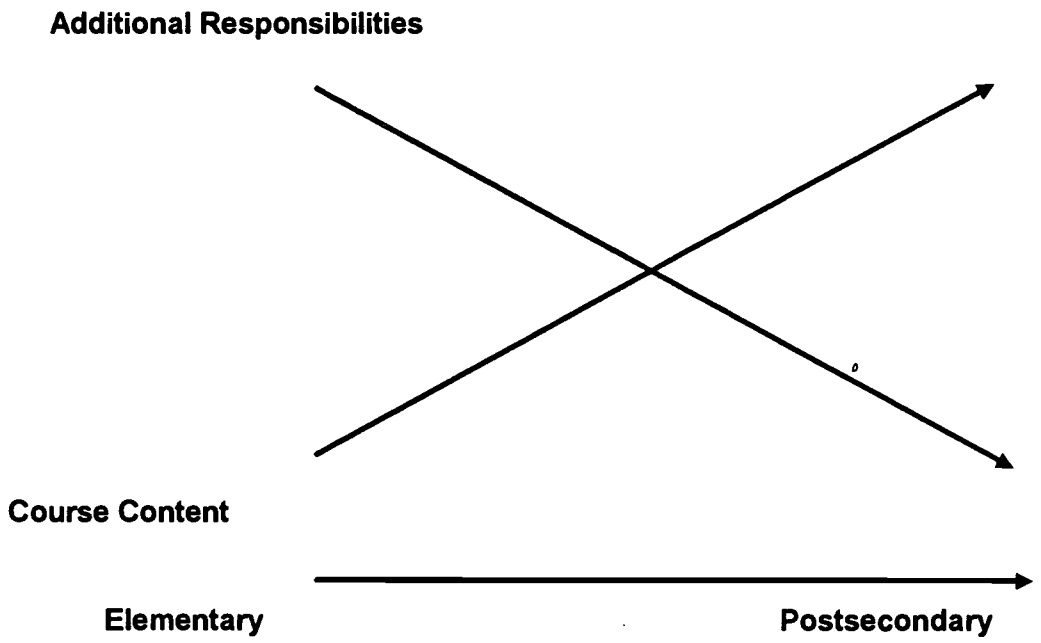


Figure 2



(Graphics courtesy of Marie Griffin, UT)

Figure 3

Interpreter: A

Sign Language Acquisition: *ITP, interaction with Deaf people*

Years Experience working with Deaf people: *13*

Years Interpreting Experience: Prior to professional training - *none*
After professional training - *2*

Years Educational interpreting Experience: *6 months*

Degrees: *AA - Liberal Arts, BA - Sign Language Interpreting*

QA or National Certification: *Has passed the RID written evaluation.*
RID performance exam - March 1996.

Professional Training: *Bachelor's program - Maryville College.*

Courses comfortable interpreting: *Most undergrad courses - humanities and related courses*

Courses not comfortable interpreting: *Math courses and upper level sciences*

Self evaluation using: ASL/Interpreting 1 2 **3** 4 5
SEE/PSE/Transliterating 1 2 3 **4** 5

Interpreter: B

Sign Language Acquisition: *ITP, interaction with Deaf people*

Years Experience working with Deaf people: *3 3/4 years*

Years Interpreting Experience: Prior to professional training - *none*
After professional training - *3 1/2*

Years Educational interpreting Experience: *3 1/2*

Degrees: *AA*

QA or National Certification: *registered for Georgia QA*

Professional Training: *ITP and workshops*

Courses comfortable interpreting: *Most undergrad courses/some basic graduate level courses*

Courses not comfortable interpreting: *Upper level math and science*

Self evaluation using: ASL/Interpreting 1 2 **3** 4 5
SEE/PSE/Transliterating 1 2 3 **4** 5

Interpreter: C

Sign Language Acquisition: *ITP, Interaction with Deaf community*

Years Experience working with Deaf people: *6*

Years Interpreting Experience: Prior to professional training - *1*
After professional training - *5*

Years Educational interpreting experience: *6*

Degrees: *AA in Interpreting*

QA or National Certification: *Georgia QA*

Professional Training: *ITP*

Courses comfortable interpreting: *Anything but upper level Science*

Courses not comfortable interpreting: *Upper level Science*

Self evaluation using: ASL/Interpreting 1 2 **3** 4 5
SEE/PSE/Transliterating 1 2 3 **4** 5

Interpreter: D

Sign Language acquisition: *One semester*

Years Experience working with Deaf people: *8*

Years Interpreting Experience: Prior to professional training - *3*
After professional training - *3*

Years Educational interpreting Experience: *6*

Degrees: *MA - Clinical Psychology*

QA or National Certification: *QA from Arkansas, Registered for RID written test*

Professional Training: *ITP, workshops*

Courses comfortable interpreting: *Liberal Arts and Humanities, Fine Arts*

Courses not comfortable interpreting: *Computer Science technology*

Self evaluation using: ASL/Interpreting 1 2 3 **4** 5
SEE/PSE/Transliterating 1 2 **3** 4 5

Figure 4

Interview Questions

1. Background/interest in UGA position

2. Educational interpreting experience

3. Endurance/stamina - discussion of schedule
   - daily hours - (4 - 5)
   - weekly hours
   - flexible - evening/weekends

4. Interpreting skills
   - certification level
   - strength/weakness in skills areas
     - " / " in course content areas (prefer math-science, English, etc.??)

5. Knowledge of Code of Ethics
   - strong point - (from interviewer's perspective)
   - weaknesses - (from interviewer's perspective)

6. "Passive Interpreting" - down time

7. Familiarity with deaf culture

8. Define "professional distance" as it applies to postsecondary educational interpreting.

9. Secondary responsibilities - if down time is extended
   - administrative experience
   - program development
   - presentations
   - time management and organizational skills
   - self-starter

10. If applicable, how will the change from freelancing to a "nine to five" job affect you?

11. Coming from a freelance background, how comfortable are you with supervision?

    What kind of supervision do you prefer?

12. Explain why you are the best person for the job - i.e. personal characteristics, professional accomplishments, etc. which make you an asset to this institution.

Debra Brenner/Bruce Finkbone
April, 1995

Figure 5

University of Georgia
Office of Disability Services

Skills Assessment Form

Applicant Name _____ Date _____

CATEGORY	COMMENTS
INTERPRETING:	
Clarity of Signs	
Clarity of Fingerspelling	
Expression	
Use of Concept	
Use of Space	
Eye Contact	
Correct Mouth Movement(s)	
Correct Sign Choice	
Size of Sign Vocabulary	
Interprets Correctly	
TRANSLITERATING:	
Clarity of Signs	
Clarity of Fingerspelling	
Expression	
Use of Concept	
Use of Space	
Eye Contact	
Correct Mouth Movement(s)	
Correct Sign Choice	
Size of Sign Vocabulary	
Transliterates Correctly	
Additional Comments:	

CATEGORY	COMMENTS
Voice Interpreting:	
Understands and Voices Signed Message into English	
Reads Fingerspelling and Numbers	
Vocal Inflection	
Fluency	
Voice Projection	
Additional Comments:	
Voice Transliterating:	
Understands and Voices Signed Message into English	
Reads Fingerspelling and Numbers	
Vocal Inflection	
Fluency	
Voice Projection	
Additional Comments	
GENERAL COMMENTS:	

Debra Brenner/Bruce Finkbone
July, 1994

Document adapted from the Quality Assurance Assessment of the Georgia Registry of Interpreters for the Deaf (GRID).

Resources For Finding Qualified Interpreters

Registry of Interpreters for the Deaf, Inc. (RID)

The Registry of Interpreters for the Deaf, Inc. (RID) is a national organization of professionals who provide sign language interpreting/transliterating services for Deaf and hearing persons. Contact RID to receive information about your local/state affiliate chapter of RID and/or interpreter referral services/agencies.

Registry of Interpreters for the Deaf, Inc. (RID)
8719 Colesville Road, Suite 310
Silver Spring, Maryland 20910-3919
(301) 608-0050

EdITOR Council and Regional Delegates

EdITOR is a special interest group of RID, composed of RID members who are educational interpreters and transliterators.

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Region III - IL, IN, KY, MI, MN, OH, WI, Ontario

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(314) 569-8100 (W)

Region IV - AR, CO, IA, KS, LA, MO, MT, NE, NM, ND, OK, SD, TX, WY Alberta, Saskatchewan, Manitoba

Malina Lindell - Region V Delegate
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Region V - AK, AZ, CA, HI, ID, NV, OR, UT, WA, British Columbia, Hong Kong Guam, New Zealand

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(423) 974-8427

Central Piedmont Community College
Services for Hearing Impaired Students
P. O. Box 35009
Charlotte, NC 28235-6421
(704) 342-6421

Chattanooga State Technical Community College
Deaf and Hearing Impaired Program
4501 Amnicola Highway
Chattanooga, TN 37406-1097
(423) 697-4452

DeKalb College
Center for Students with Disabilities
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Computer Speech Recognition as an Assistive Device for Deaf and Hard of Hearing People

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Introduction

Technology challenges us to keep up with it, adapt to it, and grow with it. This may seem to be an overwhelming challenge, but the benefits are too far-reaching to ignore. One technology that is growing at an extremely rapid pace is computer speech recognition. Developed as a dictation tool for business applications, computer speech recognition will eventually have many applications for deaf and hard of hearing people, but most of these applications are still years away. One area where it has several immediate applications is interpreting. The technology has advanced such that it can be used by sign language interpreters where the usual interpreting process encounters problems. As the speed and accuracy of computer speech recognition improves, it is likely to become a standard interpreting tool.

The Institute for Disabilities Research and Training, Inc. (IDRT) is currently involved in a three-year U.S. Department of Education grant to study how speech recognition can be used by sign language interpreters as an assistive tool to provide more complete interpreting for deaf and hard of hearing (D/HH) students in mainstream classes. Sign language is, and always will be, an effective means of communicating information to D/HH students. However, computer speech recognition can provide a useful communication tool in certain circumstances.

When the Interpreting Process Breaks Down

Sign language is an extremely effective means of communication for D/HH people in most cases. A good interpreter can keep pace with normal rates of speech accurately while providing the D/HH person with critical facial and body gestures needed to convey the speaker's emotion. However, American Sign Language (ASL) contains roughly 5,000 signs while a typical abridged English language dictionary contains about 80,000 words and speech recognition dictionaries contain up to 160,000 words. There are an estimated 500,000 words in the English language. The lack of an extensive sign vocabulary does not normally present a problem in daily conversation because people commonly use only a few thousand words of their vocabulary. For example, Jensema and McCann analyzed the captioned text of 183 television programs. Because of the volume of words collected in this study, it is an accurate representation of language spoken on a daily basis. Of well over

800,000 words in the captions, only 16,000 unique words were used. Of these, just 250 words accounted for two-thirds of all 800,000 in the text (Jensema & McCann, in press).

Extensive vocabulary is therefore not a problem in signing most communications. The estimated 5,000 signs, supplemented with fingerspelling, is adequate for most situations. The problem comes when technical or complicated vocabulary is used. Many high school and college- level courses contain complicated vocabulary for which there are no signs. Interpreters may fingerspell many of these words, but how many interpreters can correctly fingerspell the names of countries and places like Czechoslovakia, Uzbekistan, Kfar Ezion and Kealakekua Bay, or names of world leaders such as Gamal Abdel-Naser and Binyamin Netanyahu? The following words are taken from a partial list of specialized vocabulary used in a 46-minute high school anatomy and physiology class. These are words that would have to be fingerspelled or represented with made-up signs:

astrocytes	epidermal cells	ventricle
microglia	meboid	psuedopod
dendrites	ligodendroglia	paraplegic
quadriplegic	myalin sheath	oligodendroglia cell
mitochondria	adipose	node of Ranvier

Fingerspelling words such as these slows down the interpreting process while potentially creating confusion if the interpreter or student is not familiar with the correct spelling. Made-up signs can be used to communicate this vocabulary, but the D/HH student can encounter difficulties when different interpreters are used.

Foreign languages also present a problem for a sign language interpreter and student. Even if an interpreter is fluent in the language being studied, translating the target language to signed English will not benefit the student. The only alternatives are fingerspelling everything, writing all instructions and exercises on the chalkboard, learning to lip-read the foreign language, or tutoring the student on an individual basis. However, none of these alternatives is practical. Fingerspelling everything in a foreign language is too slow and difficult. Writing everything on the chalkboard is too time-consuming for the teacher and class. Lip-reading is difficult and cannot be perfectly mastered. Individual tutoring is possible, but this defeats the goal of providing equal access to the classroom for D/HH students.

Many foreign-language classrooms now focus on using a conversational mode from the very beginning. It is critical for all students to interact in the target language to develop their language skills. Many times oral exercises are not written on the chalkboard because of time limits. Fifty minutes a day does not give an instructor much time to review old lessons, teach a new lesson, and focus on conversational, listening, and writing skills. A D/HH student who does not have access to oral classroom activities is not only denied important developmental exercises but also their right to equal access to education. It is also quickly becoming the norm for colleges and universities to require students to have completed two or more years of high school

foreign language courses. This increasing emphasis on foreign languages makes equal classroom accessibility more important than ever for D/HH students.

Speech Recognition Development

Research and development for speech recognition has been going on for four decades, since Davis, Biddulph, and Balashek at AT&T's Bell Laboratories began doing research on a machine capable of understanding isolated spoken digits in 1952 (Davis, Biddulph, & Balashek 1952). From this early work, speech recognition research has expanded and is now a worldwide effort being pursued on many different fronts.

Although computers are not yet capable of understanding speech in the manner of HAL in the movie *2001 - A Space Odyssey*, or the robots in the *Star Wars* series, much has been accomplished in the area of speech recognition. There are a number of systems on the market which can be trained to understand the speech of a specific user with better than 90 percent accuracy at speeds of about 65 words per minute.

The "Holy Grail" of computer speech recognition is a system which will understand continuous speech spoken by anyone at normal conversational speeds of 120 to 140 words per minute. Although this has not yet been realized, advancing technology and an increasingly competitive speech recognition market are moving this goal toward reality. Currently, computers must be trained to understand the speech of each individual user, and users are required use "discrete speech" when dictating into the computer. Discrete speech means that the speaker must pause briefly (approximately one-tenth of a second) between each word. The computer needs this pause for two reasons: to have time to analyze the input, and to prevent the acoustic patterns of each word from overlapping and distorting the word boundaries (Markowitz, 1996). Until continuous speech is mastered, the computer must be able to identify the beginning and ending of each word to recognize it. Although this slows the user's rate of speech, dictation speeds of 65-70 words a minute with a 90-95% accuracy rate are possible and continue to improve as computers become faster and speech recognition programs improve.

Leading commercial speech recognition systems such as Dragon Dictate, Kurzweil, and IBM are "speaker dependent" systems. This means that every user must create a voice file which is based on his or her particular speech patterns. Users begin with voice files copied from a basic voice template. Voice files are modified as the system learns more about the user's unique voice characteristics. The more the voice files are used, the more likely they are to fit the particular user, and the more accurate the speech recognition process is likely to be. The process of building a voice file is essential in achieving high word recognition accuracy. Fortunately, the development of faster computers and newer versions of speech recognition systems is reducing the time needed to build accurate voice files.

The basic principles of a speech recognition system can be made to fit most any language. Several of the best-known speech recognition systems are available in a variety of languages. For example, Dragon Dictate is available in U.S. English, U.K. English, French, German, Italian, Spanish, Latin-American Spanish,

and Swedish. The IBM system is available in U.S. English, U.K. English, Spanish, French, German, Italian, and Arabic.

Speech Recognition in the Classroom

For speech recognition to be used as an interpreting tool in the classroom, it must be unobtrusive and mobile. Because system operators sometimes need to speak while the teacher is speaking, they must dictate at low enough voice level to avoid distracting the teacher and students. Most speech recognition systems have various settings which allow the operator to adjust the microphone volume and sensitivity levels. It is equally essential that the background noise level of the classroom does not interrupt the word recognition process. Excessive background noise such as laughter or slamming books can cause the program to hear phantom words or distort words which are being dictated. Most speech recognition programs also provide settings to adjust to the amount of background noise. These options give the speech recognition operator flexibility to customize the system according to the class dynamics.

As an experiment, IDRT set up speech recognition in an advanced European history class in a local high school. The class included two deaf students who shared a sign language interpreter. The class lectures contained many long and complicated European names, many of which the interpreter did not know how to spell correctly. The speech recognition system could not keep pace with the class lecture, but it was able to retrieve the difficult names with little effort. Both the students and the interpreter began to use the speech recognition screen to see how to spell certain words. It was found that speech recognition was useful as a vocabulary reinforcer in this particular situation.

IDRT spent three months using speech recognition to help interpret for a deaf high school student taking second-year Spanish. He had earned a B in Spanish I, but was falling behind quickly in the second year. His interpreter signed for him when the teacher spoke English but could not help him when Spanish was spoken. IDRT put a personal computer with Spanish speech recognition on a small cart and set it up every day next to the student's desk where the student could see the screen easily during Spanish class. A Spanish-speaking person who had trained on the speech recognition system sat next to the student and took notes in Spanish with speech recognition. Reading the screen was made easier with boldfaced and enlarged fonts. At the end of class the generated file was saved and later printed out to create a hard copy. This procedure was very helpful to the deaf student and provided much information he would otherwise have missed.

Learning to Use Speech Recognition

Learning to operate speech recognition systems is fairly simple, and an extensive background in computer operation is not necessary. Dragon Dictate, Kurzweil, and IBM provide interactive training programs to help new users establish their voice file and learn how to use the system. Once the user has created a voice file, some voice training is required. Voice training is simply dictating into a word processing

program, correcting all incorrectly recognized words, and storing the corrected data in the voice file. The computer's recognition improves as more data is entered, and the voice file becomes a more accurate representation of the user's voice.

To facilitate the process of building a voice file, IDRT has developed a workbook to train the computer to recognize the 3,000 most commonly used words in the English language. This list covers the majority of words used in daily speech. After about 15 hours of voice training, most users can dictate 65-70 words per minute with 90-95% recognition accuracy.

The key to accurate speech recognition is consistency. Users must consistently correct mistakes and pronounce words exactly the same way. If mis-recognized words (i.e. user says "can" and the computer hears "and") are not corrected, the user's voice files will become corrupted and there will be a lose of recognition accuracy. Similarly, if consistent pronunciation is not maintained while dictating, speech recognition accuracy will decline. The computer does not care if a word is pronounced in an unusual way, as long as it is pronounced exactly that way every time.

The Future of Speech Recognition and Sign Language Interpreting

Speech recognition computer technology continues to improve at a rapid pace. Computer companies are extremely eager to develop a system which can be trained to understand continuous speech. They are close to achieving this goal. Such systems are likely to be on the market by the year 2000.

Speech recognition currently has many different applications, and more will be added as accuracy and speed improves. Current applications are perhaps broader than most people realize. Medical transcriptionists are reducing the common risk of repetitive motion injury by using speech recognition to enter medical records, while many business people are using it to increase productivity by dictating their own documents. People with physical disabilities who normally cannot operate a computer with their hands can now do so with speech recognition. Among other things, this opens up the increasingly resourceful world of the Internet to severely disabled people. Furthermore, in the field of deaf education, speech recognition currently provides a special interpreting tool to help D/HH students gain greater access to mainstream classrooms.

In the future, the role of computer speech recognition in interpreting will grow as the speed and accuracy of the systems improve. Far from making interpreters obsolete in the foreseeable future, computer speech recognition is more likely to expand and enhance the role played by interpreters in communication involving deaf and hard of hearing people. It represents a new tool to be mastered and applied, and those who do so will open new markets for their services, especially among the great mass of late-deafened people who never learned sign language.

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