
Summit to Create a Cyber-Community to Advance Deaf and Hard-of-Hearing
Individuals in STEM (DHH Cyber-Community)

June 25-27, 2008

<http://www.ntid.rit.edu/cat/summit>

Educational Captioners and Interpreters:

Section of Working Paper on Captioning

As of June 2, 2008

Overview of Remote Captioning Services

In remote captioning, an intermediary operator in an office in a remote location produces text with (a) a stenographic machine, (b) a QWERTY keyboard, or (c) automatic speech recognition while listening to the information via an audio source as it is being spoken by a teacher. Often when a speech-to-text service is used, interpreting and/or notetaking services have *not* been provided to deaf/hard-of-hearing (d/hh) students unless there are several of these students who have diverse needs in a class (Marschark, et al.; Stinson & Antia, 1999).

Generally the goal of *steno-based services*, which employs a 24-key steno-machine and is also called Communication Access Real-Time Translation (CART), is to produce a verbatim display of the spoken message (Preminger & Levitt, 1998; Steinfeld, 1998; Smith, 2003; Stinson, Stuckless, Henderson & Miller, 1988).

Keyboard-based approaches often use computer-enhanced high-speed typing to provide access to the spoken information. The C-Print and Typewell abbreviation approaches uses word abbreviations to enable the service provider to, as closely as possible, capture the spoken information (Harkins & Bakke, 2003; O'Neill & Laidler, 2004; Stinson, Elliot, McKee & Francis, 2000; Stinson & Stuckless, 1998). In the last few years, *automatic speech recognition-based* (ASR) services have begun to be used as a support for communication access and learning for students who are d/hh or who have other disabilities (Aylesworth, 2006; Viable Technologies, 2005).

Needs

«GreetingLine»

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penteam\$:Current Projects:Access Center on Technology:Summit - June 25-28 2008:Groups:Interpertrs - Captioners:Captioner-InterpreterWorking Paper.doc
This material is based upon work supported by the National Science Foundation under Award No.OCI-0749253

Captioning service providers typically provide a real-time text display on a laptop computers for the student or other client to view in class, meeting, etc. However, support service needs still go unanswered in a variety of education, work, and extracurricular settings. Following are needs that have been identified for remote captioning services.

- If the speaker at the remote location, such as the teacher, wears a microphone, then s/he needs to repeat what others are saying so that the provider hears the discussion.
- The provider typically does not see the figures, charts, etc. that the teacher uses in the classroom (or other speaker in the remote setting, and this may affect the provider's comprehension of information, as well as the resultant display.
- If the material is technical, the speaker may use jargon. If the provider is not aware of these technical words it may affect the production of accurate text.
- Students, teachers and other users need to be trained to set up and use technology and equipment with which they may be unfamiliar.
- Remote services need to have sufficient flexibility to effectively support individuals in many educational, work, and community settings. For example, community colleges in isolated settings that occasionally have d/hh students who need captioning services will benefit from services that are easy to install and use, work on a variety of display devices, and are inexpensive. Other settings, such as co-op experiences, often require meetings and professional development for which communication access is obviously crucial, but for which such access is often not available.
- Easy access by students or other users to the captioned material after the class or other event has been completed. It is desirable to have an electronic record of the transcript that the student can access after the visit. This transcript will help students recall what happened at the visit and further understand course material.
- Provision of captioning support services in nontraditional learning settings, such as field visits where traditional delivery systems may be impractical. The absence of these supports can preclude d/hh students

from taking courses and participating in other activities with field visit components. Improvement of remote captioning would help overcoming this barrier.

- Disconnection and re-establishing of connections may be an issue. Disconnection may be more likely to occur if the connection is a wireless Internet connection, or through a cell phone.
- The lag time between the time a person, such as a teacher, speaks at a remote site and the display of text on the client's device may increase if cell phone lines are used.
- If speakers change and a polycom microphone is not feasible, the microphone may need to be changed from one speaker to another. This could contribute delay.
- It may be desirable to have two-way communication between the speaker and the service provider, to obtain clarification, etc.
- If there is significant background noise in the setting, such as at a factory, this can affect the ability of the provider to hear the spoken message.
- D/hh students need a way to ask questions or make comments to the teacher or others at the remote site.
- Comprehensive clearinghouse, coordinating, or scheduling systems that allows d/hh users to easily arrange for their preferred service are desirable. Currently, a user contacts an individual company or agency ahead of time and that organization then arranges services. Thus, on demand, on-the-spot service is not available.
- Captioning for Online or distance learning.

Current Services

Remote CART, automatic speech recognition (ASR), and keyboard-based captioning services are currently available (Aylesworth, 2004; Preminger & Levitt, 1998; Rapidtext, 2006; Ultech, 2003). Features of current services can be subdivided into four categories: (a) features common to ASR, CART, and keyboard systems; (b) features unique to ASR systems; (c) features unique to CART systems; and (c) features unique to keyboard systems.

a. Features common to ASR/CART/keyboard systems.

- Current remote systems typically require the speaker, such as a teacher, to wear a microphone that communicates with a phone that relays the speech signal to a provider at a remote location. Some systems describe the voice connection as a conference call.
- Placement of a polycom microphone in the class or meeting room is another recommended option. In addition, it is recommended that the provider use telephone headsets or a speaker phone in listening to the message from the class or meeting room (National Court Reporters Association, 2002).
- In some remote systems, the provider produces the text and sends it to the consumer's computer (usually a laptop), which has special software for viewing the text, via the Internet (Aylesworth, 2004). The consumer's computer usually connects to the provider via the Internet using a wired or wireless local area network connection.
- In other remote systems, the provider continuously uploads the text on an Internet site that the students' laptop then accesses. This requires minimal special software on the students' computer. These websites may allow simultaneous access by multiple users.
- Some providers describe the website as similar to a "meeting room" on the Internet. This room, or site, receives the feed from the provider and allows viewing of the text by the consumer (Caption First, 2008). Software packages such as NetMeeting, which is a free download, and WebEx allow this type of meeting (National Court Reporters Association, 2002).
- Some remote systems use a classroom interface device, such as the ccSatilite box in Caption Mic, to facilitate transfer of the speaker signal to the provider.
- Some systems include downloading of an applet or other small software package onto the web browser of the client's computer. This procedure allow better viewing of the caption's on the Internet site that is accessed by the client's computer (Caption First, 2008).
- The system may include a web camera so that the provider can see what is going on in the classroom. In addition, web cameras is one way that they provider and client may communicate with each other (Aylesworth, 2004).
- If the provider and client both share a software, such as C-Print Pro, the provider and client may communicate with each other on an independent channel.

b. Features unique to ASR systems

- The provider listens to the audio and “shadows,” (other terms are “echoes,” and “re-speaks”) the words into the ASR software, which converts the dictation into text.
- Dictation macros can enable the provider to insert names, or phrases into the text without requiring the provider to say the full phrase. For example, the provider may say “CLC” for “coordinated list of chemicals,” because the provider has entered CLC into the system’s dictionary as a macro for the expanded phrase (Caption Mic, 2008).

c. Features unique to CART systems

- Captions may be added to Webcasts. The captioning signal is added to the broadcast signal before being sent to the Web. The technology involved in this arrangement is similar to that used for regular broadcast captioning (Caption First, 2008).
- Some CART providers use text streaming. This technology regulates the flow of text so that it appears on the screen in a consistent, even manner. When the text box technology is combined with a Webcast, it enables the consumer to combine the text with other features, or pods that are part of the Webcast, such as audio, video, and chat functions (National Court Reporters Association, 2002).

Potential Benefits of a Multimedia Cyberinfrastructure

This working paper is intended to provide some initial ideas for development of a multimedia cyber infrastructure that provides remote communication support for d/hh students in STEM mainstream classrooms. The following possible benefits of a cyberinfrastructure are intended for a wide variety of class situations, from a standard class, to a laboratory, to a field trip.

- Allow a person to create on-demand service if needed.
- Allow coverage for a variety of times.
- Allow access to the service from a variety of places.
- Support access in group communication situations.
- Allow choice from among a variety of services.

- Allow easy access to the saved text version of the captioning after the event.
- Allow the combining of captions with other forms of input.
- All ways for the d/hh client to ask questions; make comments; etc.
- Maintain consistent, reliable service.
- Provide service on a variety of display devices from smart phones to desktop computers.

Associated challenges to creation of the cyberinfrastructure are as follows:

- Creation of technology that would coordinate the various options to permit choice. and that would allow the various options to work together.
- Coordination of agencies that provide services to allow near continuous availability of services.
- Creation of a scheduling system that would make on-demand or near on-demand services feasible.
- Create storage access to allow use of the saved text produced with the captions as appropriate.

Educational Captioners and Interpreters:

Section of Working Paper on Interpreters

Overview of Educational Interpreting

The presence of interpreters in mainstream classrooms began in earnest in 1975. Public Law 94-142, subsequently the Individuals with Disabilities Education Act (IDEA) promulgated the practice of educating deaf children in the "least restrictive environment", i.e., mainstream classrooms. These regulations led to a significant increase in the number of deaf children attending public schools (Moores, 1987) and a concomitant surge in the need for interpreters in those schools.

Hurwitz (1991) was one of many researchers who noted that formal training for the task of educational interpreting was lacking, a condition which persists to this day. Jones (2004) provides a useful set of terms and definitions that will clarify our topic.

K-12 Educational Sign Language Interpreter:

“Educational Interpreter” means a person who uses sign language in the public school setting for purposes of facilitating communication between users and nonusers of sign language and who is fluent in the languages used by both deaf and nondeaf persons (CO 2002, 22-20-116 (2), in CDE 2002).

[An educational sign language interpreter] ...is a professional, who facilitates communication and understanding among deaf and hearing persons in a mainstream environment. The interpreter is a member of the educational team and is present to serve staff as well as students, hearing as well as deaf people, by minimizing linguistic, cultural, and physical barriers. The title, “Educational Interpreter,” is recommended by the National Task Force on Educational Interpreting, and is intended to imply that a person holding this title is a professional with specialized preparation in deafness, whose primary role is interpreting, but who is also qualified to provide certain other educational services (New York 1998).

Interpreting:

“...the process of changing messages produced in one language immediately into another language. The languages in question may be spoken or signed, but the defining characteristic is the live and immediate transmission” (Frishberg 1990, 18).

“Interpreting...refers either to the general process of changing the form of a message to another form, or to the specific process of changing an English message to American Sign Language (ASL), or vice versa” (Winston 1989, 147).

Research shows (Jones, Clark & Soltz 1997), however, the term “interpreting” in the K-12 arena refers to transliterating (between two codes of English: one spoken, one signed).

Transliterating:

“...is a specific form of sign language interpreting. It is the process of changing one form of an English message, either spoken English or signed English, into the other form. The assumption in transliteration is that both the spoken and the signed forms correspond to English, the spoken form following the rules of standard English and the signed form being a simple recoding of the spoken form into the manual code of expression” (Winston 1989, 147).

Transliteration incorporates features of American Sign Language (ASL) to enhance clarity. Ability to transliterate implies a knowledge of ASL features so that they can be incorporated into a transliteration.

While there is a small but growing body of research into the qualifications, efficacy, roles, and responsibilities of educational interpreters, there is general agreement that an alarming number of interpreters working in K-12 settings are ill-prepared for their work. In a survey from 2001, Jones reports that 50% of educational interpreters held no certification; 58% were not evaluated for interpreting skills prior to being hired; 31% had *never* been evaluated for interpreting skills; and 38% had never received in-service training. These numbers were largely corroborated by a subsequent study (Peterson and Monikowski, 2006) of educational interpreters in Ohio.

Needs

Clearly education is chief among the needs of these interpreters. There are relatively few baccalaureate programs that specialize in the training of educational interpreters, an odd fact given that fully 20 years ago it was found that more than 50 percent of graduates from interpreter education programs (IEPs) went to work in K-12 and postsecondary settings (Stuckless et al.) . A recent survey found there to be 130 IEPs in this country. Of that number, only 30 were baccalaureate programs and of those programs, only a very few specialized in educational interpreting.

The perception of inattention to quality has also led to educational interpreters suffering something of a stigma in the interpreting community, a phenomenon little studied but much discussed, to wit the recent brouhaha when the Registry of Interpreters for the Deaf recently decided to confer full voting status on educational interpreters who met certain qualifications.

Those qualifications centered on the candidates' scores on the Educational Interpreter Performance Assessment (EIPA), a dual-purpose instrument that both measures specific criteria of interpreting competence and provides diagnostic results and recommendations (Seal, 1998). Since its inception the EIPA has become the most reliable metric for classroom interpreting, and is now used widely across the country.

The early results from this wide netting of data on educational interpreting confirm long held suspicions about the quality of interpreting in many venues. On the positive side, however, this broad implementation holds great hope for the eventual identification and acceptance of standards in this field.

Possible Directions for the Future

The advent of Video Relay Interpreting has, in a very short period of time, changed fundamental considerations in the field of sign language interpreting. Video Relay Interpreting can be defined as a technological innovation whereby the interpreter and the two interlocutors are all in separate locations. The signing consumer and the interpreter can see each other on videophones. The hearing consumer and the interpreter

are linked by phone line. In this way the interpreter can serve the communication needs of both consumers without having to be physically present with either of them.

The growth of video work is unprecedented. In 2002, Video Relay Service (VRS) companies provided 530,053 minutes of interpreting service. In 2006 that number had grown exponentially to 44,326,554, and continues to grow apace. Projections for the year ending in June of 2008 are for the provision of 65,139,834 minutes of service (NECA, 2007). This explosive growth has meant that an ever-increasing number of interpreters are committing to a steadily escalating workload in the VRS environment. Given that the demand for this service far outstrips the number of qualified interpreters able to perform it, stress on the population of interpreters has already been felt. There is reason to believe that this situation will get much more serious before it improves.

The effect of fatigue on the efficacy of sign language interpreters and interpreting is little studied and poorly understood. Moreover, the work that has been done in this regard is focused on traditional (non-VRS) interpreting. While VRS interpreting has much in common with traditional interpreting, it also has some major differences (Taylor, 1995). VRS interpreters work in circumstances that are unique to video interpreting, e.g., working from a video source, working in a cubicle, working in a rapidly changing series of contexts, working in an overlapping series of roles (interpreter, customer service agent, operator, technician).

VRS interpreting needs to be differentiated from Video Remote Interpreting (VRI). Where VRS interpreting requires that the two parties being interpreted for be in different locations, VRI does not have that restriction. The absence of this stipulation means that VRI work has potential in classrooms. However, much remains to be known about such an application. While it might serve well in lecture settings, it would be largely unserviceable in other situations, like small-group discussions or any of the sundry dialogue-based interactions that happen in classrooms.

