The Use of Streaming Media and Animation to Teach Fingerspelling and Vocabulary in American Sign Language

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ABSTRACT

The key to expressive and receptive use of American Sign Language and fingerspelling is exposure. Sign language classes provide exposure, as do extracurricular activities and required interaction time. Given the time constraints of teaching both a language and interpretation of that language within a two-year time span, I looked for ways to increase exposure time during those years. The World Wide Web has become a resource that provides increased exposure to fingerspelling and sign language vocabulary. I have worked with Thomas Bell, Director of Media Services and Telecommunications, and others at John A. Logan College, to develop a fingerspelling Web site using streaming media. I have also incorporated a vocabulary section into my classes where students can ask questions over the Internet about specific vocabulary. Either I respond to those questions in writing, or with an animated GIF file (Graphics Interchange Format) that demonstrates the particular vocabulary word or phrase.

KEY WORDS

Fingerspelling, American Sign Language and Streaming media

INTRODUCTION

Research in the field of interpreter education has shown that students learn to read fingerspelling by forming mental templates of the shape of the word (Patrie, 1992, 1997). When a person fingerspells a word, they spell out the individual letters of the word. Fingerspelling can be slow and distinct, as in spelling a proper name. It can also be executed rapidly, if the word is familiar. A fingerspelled word can also be lexicalized, which means that the fingerspelled word reduces the number of letters used, develops a unique movement, and becomes a sign. For example, the sign for "car" (Figure 1) looks like holding a steering wheel and driving. The fingerspelled word "car" (Figure 2) spells each letter distinctly, but the lexicalized fingerspelled word for "car" (Figure 3) reduces to just two letters, "c" and "r", with a movement slightly to the side.

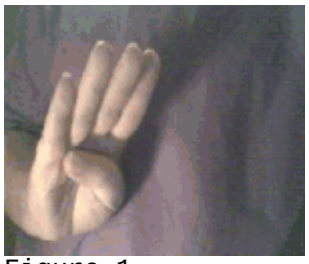

Figure 1.
Sign for car

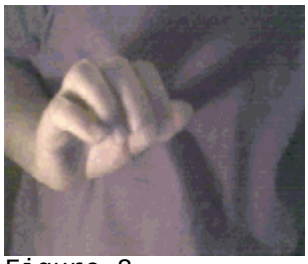

Figure 2.
Fingerspelled "car"

Figure 3.
Lexicalized fingerspelled word "car"

The template, or pattern for comprehending fingerspelled words, is formed by repeated exposure to natural fingerspelling. In much the same way, American Sign Language (ASL) vocabulary is learned by repeated exposure and use.

PROBLEM

Our program is a two-year associate degree program. The two-year time limit does not afford adequate time to expose students to enough of the patterns of the language to ensure fluency. Because of this, we have explored additional methods for building fluency outside of the classroom. Paul Menkis, Associate Professor, requires the students to acquire contact time in the ASL courses in our program by conversing with deaf people. This has helped with vocabulary acquisition and fluency.

I have added vocabulary development hours, interpreting practicum hours, and fingerspelling practice to the interpreting courses in our program. This had the effect of enhancing students' ability to understand fingerspelled words, to interpret with more fluency, and to acquire additional vocabulary. We have seen evidence of this effect in the improved scores that students earned on the Wisconsin State Interpreter/Transliterator Assessment (WITA) at the completion of our program. We also added another deaf instructor, Tina Caloud, as a part-time instructor in our program. This gave students exposure to more than one deaf teacher. We noted an increase in students' performances on state interpreting exams after making these changes.

While students' test scores increased, we were still graduating students who were scoring minimum levels on the state exam. We raised our minimum standard for the final comprehensive test to pass out of our program, from 70% to 75% for the graduating class of 1999.

The transliterating scores on the state exam have proven an effective measure of vocabulary use and fingerspelling comprehension. (Transliteration in our field is defined as taking a spoken message in English and rendering its meaning using ASL signs in English word order, or taking a signed message that follows English word order and rendering it into spoken English.) Transliteration requires fluency and rapid use of vocabulary. Significantly, the transliterating test also measures the ability to read and interpret fingerspelled words. The mean score on the transliterating portion of the Wisconsin Interpreter/Transliterator Assessment (WITA) in 1999 was a 2.8 (4 is the

lowest passing score on this scale and 1 is the best possible score.). Two students received a score of 4. The score of 2.8 was an improvement over the 3.1 mean score in 1998.

While we were happy with these scores, we still felt the need to raise our minimum-passing grade to 78%. We all agreed that our program should be graduating students who achieve at least a level 3 on either the interpreting or the transliterating portion of the test. Past graduates who achieved at least a level 3 on the WITA have consistently demonstrated the ability to interpret entry-level college classes. Those who scored a level 4 have had difficulty in the college classroom.

We felt that if we raised our minimum-passing grade to 78%, we would need to provide ways for students to have more exposure to the language so that they could achieve higher scores. Hours in the classroom were fixed. They could not be increased because our program is at the upper limit of credit hours that we can require for an associate degree. We had also stretched our limits in our practicum requirements.

SOLUTION

The only way that we could see to increase the students' exposure to ASL signs and fingerspelling was to make resources available online, as enrichment for our classes. Paul Menkis and I both attended the Faculty Summer Institute (FSI) <http://illinois.online.uillinois.edu/fsi/fsi99/> in 1999, and learned about designing and teaching Web courses. We developed a course proposal for an optional summer online course called Educational Interpreting.

I used what I had learned at the FSI to design a Web site for our program. After getting my feet wet, I began designing the Educational Interpreting course for the World Wide Web. Thomas Bell and I also started exploring how to use animation and streaming media to show signs and fingerspelling on the Internet.

METHOD

In order to record video images for streaming I needed a video camera that could be connected to my computer. Streaming is a way of delivering video files so that they can be viewed almost immediately without having to download the entire file into your computer first. For a more in-depth discussion of streaming media and its applications, see the online tutorial created by RealNetworks, Inc. <http://www.realnetworks.com/feature/032000_feature.html?src=home_072000_feature> We applied to Perkins for a grant to purchase the equipment necessary.

The computer in my office is a Comptech computer, which was built for me using specifications provided by John A. Logan College. Our program is one of the programs at John A. Logan College that is eligible to receive Perkins Grant funds. We were awarded the funding and bought the video camera, a Winnov Videum Conference Pro, connected to my computer through a PCI (peripheral component interconnect) card. The

camera adjusts for the amount of light automatically and the image is clear and the quality is excellent.

Tom Bell, Director of Media Services and Telecommunications, helped me learn how to record video images. He came to my office after the video camera was installed and helped me make my first streamed video. I sent the video file to Tom via e-mail so that he could convert the video file for streaming from his office computer. Using Real Producer Pro <http://www.real.com/>, he converted the video file so that it could be streamed. He uploaded the file from his computer, and for the first time, I saw what signs in streamed video looked like on the Internet. When I watched the streamed video at home with a 56 k modem, I noticed that the signs were readable, but a bit choppy at times. At John A. Logan College, which has a fast network connection, the signs were clear. One advantage is that the video could be replayed as many times as necessary to understand the message.

I have seen other applications using sign language video files that have to be downloaded. While these video images are clear, they take an extremely long time to download. In addition, they require quite a bit of memory to play. Streamed video files are transferred to the viewer very quickly, but rely upon the speed of the Internet connection for clarity. Because college students do not often have state of the art equipment, I decided to work with streaming video files. Streaming video files still require a faster connection speed, 56 k or greater, and a media player, such as Real Player Basic 8, which can be downloaded for free.

I started thinking about other places where streaming media could be used in my course work. An obvious application was fingerspelling. Fingerspelling requires less movement than signing. Because of this, streamed fingerspelling videos are clearer than streamed signing videos.

The process of template building in reading fingerspelling requires repeated exposure to the same pattern. There are some Fingerspelling Web sites that teach fingerspelling and provide practice in reading. The ASL Fingerspelling Dictionary <http://where.com/scott.net/asl> is one such site. The words in these sites however, are not sorted into lists of similar words and fingerspelling patterns.

For two years, I had been using a word list handout with my classes to practice reading fingerspelling. The word list that I used was organized into groups of words. Each word group started with three- or four-letter words that all had the same letter pattern. For example: cat, sat, hat, and what all contain the "at" pattern. Each group started with simple words and ended with more complex words that had six, seven, eight, or more letters.

When reading fingerspelling, words that change shape significantly are easier to read. The word "book" is fairly easy to read because the fingers are extended on the "b", all of the fingers touch the palm on the "o", and the index finger is extended on the "k" (See figure 4).

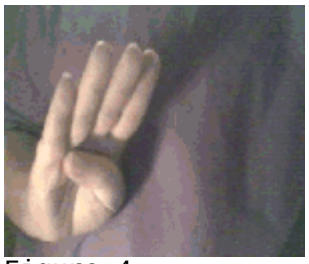

Figure 4.
"book" fingerspelled

Conversely, the word "eat" is not very easy to read because the fingers touch the palm of the hand through the entire word (See Figure 5).

Figure 5.
"eat" fingerspelled

I adapted the word list for fingerspelling by starting with groups of words that changed shape significantly, and ending with groups of words that change shape very little and are therefore more difficult to read. I also sorted the words, putting them in order from three-letter words to multiple syllable words that all use the same pattern. Because I created my handout in Microsoft Publisher, I decided to convert it into a Web site. Finally, I added links to streamed video of those words being fingerspelled. This way, students could practice those patterns on their computers at home in addition to being exposed to them in the classroom.

Once this was set up, I began creating video files of fingerspelled words for the site as I had done before. When I created my first fingerspelling video file, I did not realize how large it would be. When I tried to send it via e-mail to Tom Bell my computer froze. I recreated the file, making it smaller by spelling fewer words. When I sent that to Tom, the mail server crashed. Finally, we found a way to save the video files in a shared folder on our network, to which both Tom and I had access. This way, he was able to convert the files and upload them to the server. I could also save several files at once, which meant that I could ask some of the deaf students and teachers on campus to fingerspell words too. This made several models of fingerspelling available to the students, not just one. Since that time the college has purchased Real Producer Pro for my computer so that I can convert the video files for streaming myself. This was done through the Perkins grant.

When I recorded the first few videos, I did not realize how much the background would affect the quality of the image. My office walls are orange and shiny. This presented a problem because the background interfered with the readability of the signs. A visit to

Hobby Lobby solved that problem. I found some light forest green construction paper in large sheets and double stick tape. When that was taped to the wall of my office it provided enough contrast to the skin tone of the signer to make the fingerspelled words readable.

The Fingerspelling Web site <http://www.jal.cc.il.us/ipp/fingspell/index.html> is still under construction. There are nine pages in the site, and I have to date recorded three pages of video clips. I have been trying to include as many different signers as I can in order to present a variety of fingerspelling styles. It has taken longer than anticipated to create the site because of the availability of deaf people willing to fingerspell at times when I can record them.

I also decided to convert another handout that I had made into a Web site. The Web site deals with the concept of "classifiers" in ASL. Classifiers are unique to signed languages. They are specific handshapes that are used to represent objects, animals, or people. For example, the index finger pointed up can be used to represent a person walking. The hand is moved in a specific pattern to show the style of walking. The Classifier Web Site <http://www.jal.cc.il.us/ipp/Classifiers/index.html> is also under construction. Again, I am trying to find a variety of deaf people who use ASL and can sign stories for the classifier page.

Fingerspelling and classifiers are two grammatical features of ASL that are difficult for non-native users to master. Making them available on the World Wide Web has helped our students acquire mastery more quickly.

I also wanted to address the need for vocabulary development. There are several online dictionaries of ASL, including A Partial Sign Language Online Dictionary <http://www.handspeak.com>. These dictionaries give general vocabulary, but they do not give that vocabulary in context, or address the selection of vocabulary to use while interpreting various concepts or nuances. By adding bulletin boards to the Web components of my classes, I was able to address those issues. The students can post vocabulary questions to the bulletin board for the week, and I will respond with either a written explanation of the vocabulary word, or an animated GIF file showing the sign or signs that fit the concept.

I used this first in a course titled "Field Experience" <http://instruction.jal.cc.il.us/wcb/schools/JAL/ipp/pwillig/3/index.html>, which is a practicum course. Students spend most of their time out in the field interpreting, and they generate many vocabulary questions. When they encounter difficult vocabulary, they can post their vocabulary questions to the bulletin board the same day and receive an answer promptly. Because we only meet in class one hour a week, I can only respond to a few vocabulary questions in class. In addition, short responses in class do not give students time to integrate the new vocabulary into their lexicon. Responding online the same day as the interpreting assignment has helped students to integrate vocabulary more quickly. I answer their questions while the information is still fresh in their minds.

To create animated GIFs I purchased a second video camera, a Logitech V Cam U1, for my computer at home. I have the option of recording video, or taking still pictures with that camera. I discovered that it was easier to take several still shots, planning the movement in the sign, and then creating an animation from those still bitmapped images. To create an animated GIF file from a video requires much more editing to get a smaller file size.

In order to take still photos while both of my hands are moving, I place the mouse on the floor. I move the cursor over the camera button on my monitor. Then I click the mouse with my toe, while moving my hands. It takes a bit of coordination, but it works. I then save each individual photo as a bitmap image, and open Paint Shop Pro Animation Shop. You can see examples of the GIF animations earlier in this paper. I could use another animation program, but I find this one very fast and uncomplicated to use. I am very interested in efficiency because I may have 10 or 15 vocabulary questions in an evening.

After creating the animation, I reduce its size and optimize it so that it will upload and download quickly. Then I save it as a GIF file and attach it to my post on the bulletin board. When the students click on "view attachments", they can access the GIF image <http://instruction.jal.cc.il.us/wcb/schools/JAL/ipp/pwillig/3/forums/forum7/messages/2.gif>. I require that they post their vocabulary questions in context, giving me a full sentence that they want me to translate. That way, I can give them several options, or discuss the best option for the context. Usually more than one student has the same question, so the bulletin boards serve as a resource for the full class. I have recently made a background out of cardboard that can be used when recording my GIFs. That background cuts down on glare. I have saved all of my animations onto a zip disk, so that I can use them again in future classes.

EVALUATION

The World Wide Web resources first became available to the students during the 2000 spring semester. The graduating class has taken the Wisconsin Interpreter/Transliterator Assessment and has received their test scores. With all of the students reporting, the mean score on the transliterating portion of the test is a 2.3. No students scored less than a 3 with a mode of 2. This is the best test statistic in the history of our program.

Some people have commented on the various pages in our sites and the bulletin board vocabulary words. Here are some of their comments:

On the fingerspelling site: "many, many thanks. This is brilliant. I shall get practicing now!" (comment from a professional interpreter)

On the bulletin boards: "I enjoy having my vocabulary questions answered so quickly. It really helps." "Thank you so much Paula, I really enjoy having this Web site to turn to for information." (student comments)

On the classifier site: "That's cool that the story shows how the classifier is used." (student comment)

SUMMARY AND RECOMMENDATIONS

The Web resources that we have provided have proven to be an effective method for enhancing the development of language and interpreting skills. While developing these resources takes time, I feel that the time is well spent. The resources that are developed can be accessed repeatedly for maximum learning.

Professional interpreters have also made use of our Web sites. These sites have become a resource, not only for our students, but for the professional interpreting community as well.

I plan to develop more sites using streaming video. I will target specific areas that tend to be weak in emerging interpreters. That way, students can work on overcoming their weaknesses outside of class. I would recommend that anyone who wishes to develop this type of media consider carefully issues such as background and lighting. Video files tend to take up a lot of memory, so it would be best to make several small videos rather than one large one. This also makes the information more manageable for the students. I would also recommend that people assisting with the project be paid a stipend. If we could have paid stipends, the videos would have been produced more quickly because there would have been financial incentive to work on the project.

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BIOGRAPHICAL STATEMENT

Paula M. Willig
<http://instruction.jal.cc.il.us/wcb/schools/JAL/ipp/pwillig/pwillig.html> has been a sign language interpreter for 24 years and is certified by the national Registry of Interpreters for the Deaf with a Comprehensive Skills Certificate. She has her M.S. in interpreter education from Western Maryland College, Westminster, Maryland. She has taught interpretation at John A. Logan College for six years.

Paula has recently discovered the value of the Internet in interpreter education. She currently has a Web component for each of her classes and is teaching two online courses. Paula designs and maintains Web pages for her program as well as these organizations: **The Illinois Registry of Interpreters for the Deaf** <http://www.jal.cc.il.us/IllinoisRID>, **Little Egypt – Illinois Registry of Interpreters for the Deaf** <http://www.jal.cc.il.us/LEIRID>, **St. John Lutheran Church, Chester, Illinois** < http://www.stjohnchester.com/>.