**Supporting ASL Learning through Interactive
CD ROM Technology:
The American Sign Language Vocabulary CD**

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Abstract

One important aspect of learning American Sign Language (ASL) is drill and practice leading to ownership of vocabulary. In addition, beginning learners of ASL are sometimes confused by signs that have very similar handshapes and locations of articulation. The American Sign Language CD affords learners the opportunity to practice ASL vocabulary using three primary interactive strategies: (1) Look It Up, (2) Receptive Drill and (3) Expressive Drill and, to compare signs which have similar production characteristics using a See Similar Signs function. Within the three interactive instructional strategies users can view and practice approximately 2000 ASL signs by (1) Alphabetical Listing of main glosses and synonyms, (2) Categories and (3) the user's Own List. This CD, therefore, provides a useful resource for learners as an adjunct to classroom instruction and can be used in conjunction with any ASL curriculum.

This poster session presented the American Sign Language Vocabulary CD and demonstrated the instructional strategies for drill and practice of ASL vocabulary. Data regarding evaluation of this learning tool was presented.

Introduction

One important aspect of language learning is the ability for students to drill and practice vocabulary using multiple strategies leading to ownership; that is, the ability to recall and use appropriate vocabulary in context with automatic recall. Language learners often rely on dictionaries to translate their native language vocabulary into the vocabulary or phrases of the target language. Usability and convenience, the ability of language learners to gain easy access to the practice material, is also facilitative and motivating.

The ASL Vocabulary CD was developed to meet the above criteria and to provide a useful resource for learners as an adjunct to classroom instruction that could be used in conjunction with any ASL curriculum. The ASL Vocabulary CD is based on a previous mediated learning format using videodisc and interactive computer-based technology. This previous technology, while employing many of the same practice strategies contained on the ASL Vocabulary CD, was restricted to a self-instruction lab with videodisc players; thus making this practice technology somewhat limited from

an accessibility point of view. Major goals of the ASL Vocabulary CD project were to (1) transfer the existing video images used for the ASL Vocabulary Videodisc to a CD with updated programming and (2) make the CD more widely accessible at the work stations and home computers of faculty and staff of the National Technical Institute for the Deaf (NTID).

Interactive Practice Strategies

The American Sign Language CD affords learners of ASL the opportunity to practice ASL vocabulary using three primary interactive strategies: (1) Look It Up, (2) Receptive Drill and (3) Expressive Drill. Within these three interactive instructional strategies, users can view and practice approximately 2000 ASL signs by (1) Alphabetical Listing of main glosses and synonyms, (2) Categories (24 categories, that set a context for the review or drill) and (3) the user's Own List. In addition, because beginning level learners are often confused by signs which have similar production characteristics such as similar handshapes and locations where the sign is articulated, the ASL Vocabulary CD allows users the opportunity to compare signs through the See Similar Sign function.

Look It Up: With the Look It Up strategy, users can (a) type in an English word for which they want to see the sign translation. The CD will search its database and present a list of signs that translate the English word. Or users can choose to view (b) an alphabetical listing of all of the signs and English word synonyms for signs contained in the entire database or (c) search the database by category, in which case an alphabetized listing of all of the signs and English word synonyms will be listed which fit the chosen category. With either of these latter two strategies the user simply clicks on the item they wish to view and the video window pops up and plays the video image.

Receptive Drill: With the Receptive Drill strategy, users may select a drill based on a category, the entire database, or their own list. Each Receptive Drill is comprised of 20 items selected randomly. A video presentation of the sign plays and the user is prompted to type in a translation of the sign in English. The user may replay the sign at normal or slow speed any number of times before responding. If user responses are contained in the database, they will be congratulated appropriately for a correct response. If user responses are not a recognized translation, they will be informed and encouraged to try another translation. If users have no response, they may pass on the item by choosing a "Show Answer" option. When users have completed the 20 items in the drill, they are presented with their score (number of items answered correctly) and offered the opportunity to practice again on those items they did not answer correctly. No scores are stored and users can quit drills at anytime to move to a different practice strategy or quit the program. At any time when presented with a video presentation of a sign, users can click the See Similar Signs function and compare the sign they are viewing with other signs having similar production characteristics.

Expressive Drill: The Expressive Drill strategy works somewhat in reverse of the Receptive Drill strategy. With the Expressive Drill strategy users are presented first with an English word or phrase and prompted to produce a sign that will appropriately translate the English word. Users must then click on the "Show the Sign" button to see the video presentation of the sign. Since there are no answers that can be scored with the Expressive Drill strategy, there are no congratulatory messages

and no summative score given at the end of each 20 item drill. Again, Expressive Drills can be drawn from the entire database, a category or from a user's own list.

User's Own List: A unique design feature of the ASL Vocabulary CD is the User's Own List function. With this function users can type in a list of English words they specifically wish to practice. The program will search the database and draw from it all of the signs matching the English words typed in. This feature makes the CD adaptable to any ASL curriculum. For example, students can type in (and save to their hard drive or a storage disk) a listing of vocabulary assigned from a particular unit of instruction and use this list for specific drill and practice of the targeted vocabulary. Or, as another example, if users have particular difficulty with certain vocabulary, they can create specialized lists to practice using the User's Own List feature.

Evaluation

In February 2001, all faculty and staff at National Technical Institute for the Deaf (NTID) in Rochester, NY received a complimentary copy of the ASL Vocabulary CD. An accompanying cover letter alerted recipients that the project team would be contacting them in approximately a month for feedback regarding the CD. By March 2001, an evaluation form (attachment) was posted on the ASL Vocabulary CD website (http://www.rit.edu/~cad0410/aslvocabcd/). Easy access to the web form was provided via two emails sent six weeks apart to all faculty and staff asking them to go to the website and fill out the evaluation form. Seventy-four of the eligible 564 recipients responded. These evaluations provided the project team with data regarding satisfaction with the CD. The return rate represents a 13% participation in the evaluation.

Highlights of the Evaluation

Highlights and interpretation of feedback received are discussed here. "Ease of Access" and "Usefulness as a Resource" were our two main goals in converting this instructional resource from videodisc to CD.

To make the ASL Vocabulary CD accessible, we placed this visual reference tool at the fingertips, at the workstations, and in the homes of our faculty and staff. We speculated that such a tool would be especially useful to those faculty and staff at a beginning or an intermediate sign language skill level. Sixty-eight percent of our respondents were at these skill levels. The majority of respondents at each skill level reported to use the CD at least occasionally (see Table 1).

Comments with regard to "Usability" and "Accessibility" included:

- I am delighted to have this for a tool to practice at home. One of my questions since I have learn sign language last year was having something I could practice at home.
- Bravo!! It sure beats getting over to Building 60 and sitting in the Self Instruction Lab! I can load in the CD and practice at my desk for lunch and breaks.
- It is user friendly and someone is uneducated about computer can use it.
- Having a sign resource right at my fingertips!
- The menus were clear and offered a clear path to the designated location.

- The ability to use it privately and conveniently.
- I can use it anywhere.
- I only looked at the laser disk in the SIL once and this looks like the same info. I was glad to see it is so easy to access whenever I want to now.
- Easy to navigate.
- It's nice to have easy access to a sign that you don't know or can't remember how to sign.

Table 1 - Respondents' ASL Skill Level and Frequency of Use

Level	N	No Use	Once	Occasionally	Every Week	Every Day
Beginning	20	1	4	10	4	1
Intermediate	30	0	6	18	4	2
Advanced	13	0	4	9	0	0
Near Native	7	0	3	4	0	0
Native	1	0	0	1	0	0
Instructor of ASL	2	0	1	1	0	0

Our second goal of producing a useful resource was met as shown by the data in Table 2. Of 50 respondents who self rated as having either Beginning or Intermediate level sign language skills, 72% (n=36) were "Very Satisfied" and 22% (n=11) were "Somewhat Satisfied" with the CD. Considering respondents at all skill levels 70% (n=51) reported that they were "Very Satisfied" and 23% (n=17) reported that they were "Somewhat Satisfied" with the CD.

Table 2 - Satisfaction with Usefulness of the CD as a Learning Tool

Respondent's ASL Skill Level	N	Very Satisfied	Somewhat Satisfied	No Opinion	Somewhat Dissatisfied	Very Dissatisfied	No Answer
Beginning	20	13	5	1	0	0	1
Intermediate	30	23	6	1	0	0	0
All Respondents	74	51	17	2	3	0	1

Comments with regard to "Usefulness as a Learning Tool" included:
- It has been helpful in my receptive skills and learning that there are more than one signs for many words. I have been trying to familiarize myself with the different signs to one word and also the reverse is helpful.
- I am using it for practice and to improve my signing and receptive skills. I am also taking it home with me for extra practice.
- Practice for my SCPI [sign evaluation] rating for one, but as a great 'brushing up' tool and a 'dictionary', it can't be beat!
- Confirming accuracy of production of specific signs; general broadening of vocabulary.
- Mostly to remind me how to form a particular sign. Secondarily to check out similar signs to ensure I'm not making a mistake.
- Thank you for having a valuable tool to learn sign language. I feel it is good support for the ASL classes I am taking!!

- Looking up particular signs, much as I would use a dictionary.
- The CD is a very nice tool for beginning signers like myself. I like to sit with it when I have free time and just search for signs I do not know. I have increased my sign vocabulary quite a bit by doing that.
- Great job...many thanks for this...it is a VERY USEFUL TOOL.

Users broadly tested the strategies and functions available on the CD. Table 3 shows that "Receptive Practice" and "Look It Up" were the most popular of the strategies; accessed by three-quarters of the users.

Table 3 - Percentage of Respondents Using Each Strategy/Function

Expressive Drill	Receptive Drill	Look It Up	Type It In	Your Own List	Similar Signs	Help
47%	73%	73%	43%	15%	41%	16%

Table 4 shows that repeated use of the ASL Vocabulary CD resulted in more frequent use of the alphabetized list of glosses and synonyms as the path to desired information (review or drill). The remainder of the comparisons tell us that "one time users" and "repeat users" sampled similar strategies available on the CD.

Table 4 - Comparison of One Time Users and More Frequent Users

	N	Express.	Recept.	Look It Up	Type It In	Your Own List	Similar Signs	Alpha Lists	Categor.	Help
Used It Once	18	50%	66%	66%	56%	11%	33%	17%	39%	6%
Used It More Than Once	55	47%	76%	76%	40%	16%	44%	55%	49%	20%

When asked which one strategy did they use most frequently, nearly 50% of the respondents identified the Receptive Drill.

Table 5 – Most Frequently Accessed Strategy/Function

Expressive Drill	Receptive Drill	Look It Up	Similar Signs	Help
4%	47%	36%	4%	1%

Comments with regard to "Strategies and Functions" included:
- I like the replay function. I like having a variety of senders to look at. I love the 'similar signs' part.
- Able to type words to find signs...and read signs and type words to see if it is correct. Excellent...the price is great for my students!

- The categories listed are good – I reviewed a couple that looked applicable to what I am studying about now in ASL IV class (family, prepositions).
- The availability to look-up a word by typing it in or category, etc. I frequently use the slow option.
- That I can make my own list, I can slow.
- Mostly to practice my receptive skills and look signs up.
- I have been using it mostly for looking up individual words, however I like the ability to have it drill me as well.

Conclusion

An important aspect of learning American Sign Language (ASL) is drill and practice leading to ownership of vocabulary. The American Sign Language CD affords learners of ASL the opportunity to conveniently practice ASL vocabulary using three primary interactive strategies: (1) Look It Up, (2) Receptive Drill and (3) Expressive Drill and, to compare signs which have similar production characteristics using a See Similar Signs function. This CD provides a useful resource for learners as an adjunct to classroom instruction and can be used in conjunction with any ASL curriculum.

A primary goal for our project team was to convert an existing resource, the ASL Vocabulary Videodisc to CD technology to enable greater accessibility for the faculty and staff at NTID. The former media (videodisc and interactive computer technology) was laboratory bound, therefore limiting accessibility and its impact on learning. Evaluation of the ASL Vocabulary CD appears to confirm that we have met our goal. The ASL Vocabulary CD has been very positively received. Users report a high degree of satisfaction with the CD as a learning tool and recognize the value to them in having a useful, easy to use tool at their workstations.

Evaluation comments with regard to best features and overall value included:

- I can see (3D) how exactly to sign something...instead of guessing what they mean in a book diagram.
- I really am just beginning my study, however, the CD has been extremely useful as a starting point/reference tool for me.
- 2 things that I like are: 1) it is convenient to use 2) there is a large selection of words that I can practice and receive immediate feedback.
- Great resource for those "need to know NOW" signs!
- Looking up signs. Later, expressive skills with classifiers when I get more time in the summer.
- I am able to use the CD at home instead of going to the learning lab every day. It is very convenient and fits into my schedule.
- It make it easy to find signs for words I don't know. I am impressed that just about everything I've tried to look up has been there.

- Excellent production! You are to be congratulated. Hopefully this will set a new standard for what dissemination of information about signing and signs should be. If you are looking for follow-up ideas, some systematic exploration of contrasts, comparisons and similarities might be of interest (just as there are books on the market distinguishing between shades of meaning of similar or seemingly-similar English words).
- High quality. Really a great job. One of NTID's best products ever.

AMERICAN SIGN LANGUAGE VOCABULARY CD
FEEDBACK FORM

Please take a few moments to fill out this form. Your feedback will help us to assess the CD's usefulness and to make improvements for future releases.

What best describes your ASL level (check all that apply):
    Beginning
    Intermediate
    Advanced
    Near Native
    Native
    Instructor of ASL

How often do you use the ASL Vocabulary CD?
    Have not used it.
    Looked at it once
    Use it occasionally
    Use it every week
    Use it every day

What functions of the program have you used? (check all that apply)
    Expressive Drill
    Receptive Drill
    Look It Up
    Type It In
    Your Own List
    Categories
    Browsing Alphabetical List
    Similar Signs
    Help

Which of these functions do you use most often?
    Expressive Drill
    Receptive Drill
    Look It Up
    Similar Signs
    Help

For Look-Ups and Drills, which of these sources do you use most often?
    Type It In
    Your Own List
    Categories
    Alphabetical List
    Entire Disk

Please rate the following aspects of the ASL Vocabulary CD:

	very satisfied	somewhat satisfied	no opinion	somewhat dissatisfied	very dissatisfied
Ease of opening the program					

Navigation design
Help resources
Ease of use

Accuracy of signs
Clarity of signs
Choice of signs included
Usefulness as a learning tool

On what computer make, model, and operating system (e.g. MacOS#, Windows 95/98/2000/NT) are you running the ASL Vocabulary CD?

How do you anticipate using this ASL Vocabulary CD?

How has the ASL Vocabulary CD been useful in your sign language learning?

What problems or errors have you encountered with the CD's operation or content?

How can the ASL Vocabulary CD be improved?

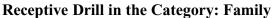What do you like best about the ASL Vocabulary CD?

Other comments:

Look It Up By Typing In a Word

Look It Up By Browsing Alphabetically

Receptive Drill in the Category: Family

Expressive Drill in the Category: Colors

Contact Information:

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