

SCIENCE, TECHNOLOGY, ENGINEERING AND MATH SIGNS DICTIONARY PROJECT

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ABSTRACT

Spoken language lexicons for technical terms in the Science, Technology, Engineering and Math (STEM) disciplines are well standardized. However, in sign language communities, signs for many of these words and concepts either do not exist or are not sufficiently standardized. Those who sign these terms are often forced to create the signs *ad hoc*. Two difficulties arise with this: a) depending on the signers' skill in the relevant languages, these signs may lack semantic accuracy and specificity; and b) the signs are often different from one teacher, interpreter or tutor to the next.

For the deaf student, this is extremely problematic. If a sign lacks semantic accuracy and specificity, the student is getting incomplete and/or erroneous information. If a technical term is signed differently between classes, the student must cobble together the various bits of meaning received and hope that the resulting understanding is correct. Even when this process is successful, the deaf student has been forced to navigate a jigsaw puzzle of lexical confusion, while hearing peers are free to attend exclusively to course content.

This poster presentation will demonstrate one tool for alleviating this problem: an **American Sign Language (ASL) STEM Signs Dictionary Project**. Information Technology and Laboratory Science modules have been created. For each module, 150 terms, with technical definitions and sentence level context, are presented online in both English text and ASL video. More disciplines' dictionaries are being created. The website containing this resource will be available for ICED participants to experience, and is available for public use at www.DeafTEC.org.

CREATING STEM SIGN DICTIONARY MODULES

Operating Principles

In creating a dictionary resource, it is important to recognize that language change is an organic process. Attempts to externally impose new vocabulary, new usage for extant vocabulary, or translations of words from one language to another are rarely successful. Artificial vocabulary may be created, but will rarely survive because the people who have a need for referring to the object or idea in question will naturally gravitate to the lexical item that most effectively combines descriptive and semantic accuracy with ease of use.

When an object or idea first appears in a language community, whether local or international, there is an open, *de facto* competition to create a word with which to label it. Words become successful when they attain common currency, at which point they make it into dictionaries. While in the short term dictionaries are considered the authority to which we turn for a word's legitimacy, in the long term dictionaries merely

follow and document usage. When a word's use declines, dictionaries drop it. It is the use of words that bestows their legitimacy, not dictionaries.

With a spoken language enjoying majority status, such as is the case with spoken English in the United States, this process needs no guidance. Words appear when needed, and either survive or not.

The STEM Signs Dictionary Project observes and follows this basic principle; not only for reasons of respect for culture and language, but because doing so will make the resource more effective and useful. The first step in choosing which signs to include on the website is to examine signs now used for English STEM vocabulary around the country. This ensures that the STEM ASL vocabulary research is nationally based, and that the content and language specialists working in the STEM Signs Dictionary Project are informed by the widest possible range of current ASL terms.

Project Staffing: Project Director and Discipline Teams

The Project Director creates a Discipline Team for each STEM discipline addressed. Team members of course change depending on the discipline being targeted, with the exception of the Project Director, who will serve as participating director of each Discipline Team. Each team consists of the following:

1. The Project Director
2. At least one NTID deaf faculty member in that discipline
3. At least one professional interpreter working in that discipline
4. At least one deaf student either majoring or having significant course experience in that discipline

Steps Used In Choosing and Including ASL Translations For STEM Terms

1. Construct a list of English terms for the discipline, with input from partnering colleges and schools representing a wide geographic distribution around the US.
2. Make video recordings of the signs used for these terms at these partner schools, and gather crowd-sourced videos.
3. Analyze the resulting video and choose the best options for inclusion using the following criteria:
 - a. Semantic accuracy
 - b. Ease of use
 - c. Adherence to ASL morphological conventions
 - d. Minimal use of fingerspelling
4. Write definitions of the terms in both English and ASL.
5. Write sentences, in both English and ASL, that demonstrate the terms' use in context.
6. Make videos of the ASL terms.

7. Make videos of the ASL definitions.
8. Make videos of the ASL sentences.
9. Insert the text and video into the website.

THE PRODUCT: COMPONENTS OF THE STEM SIGNS DICTIONARY

The heart of the STEM Signs Dictionary Project is the website and database. It currently contains Information Technology and Laboratory Sciences disciplines; an Engineering module will be online in 2016.

These are the dictionary's components:

1. A combined, searchable master list of English terms in STEM disciplines. This is the comprehensive English list of all the STEM terminology included in the project.
2. ASL vocabulary equivalents -- signs presented in video -- for all terms.
3. Definitions of all STEM terms in both English text and ASL video.
4. Sentences for each sign that provide grammatical and semantic context, in both English text and ASL video.