

Increasing Access to Technical Science Vocabulary Through Use of Universally Designed Signing Dictionaries.

Judy Vesel and Tara Robillard

—In S. Burgstahler (Ed.), *Universal design in higher education: Promising practices*. Seattle: DO-IT, University of Washington. (2014).

Summary

State frameworks and national standards are explicit about the science and mathematics content that students in grades K-12 must master at each grade level. The Individuals with Disabilities Education Act (IDEA) and the No Child Left Behind (NCLB) Act mandate that students in grades K-12 who are deaf or hard of hearing must have access to this content.

Although individuals who are deaf or hard of hearing are not necessarily considered "print disabled," those who acquire and use American Sign Language (ASL) to communicate tend to internalize a linguistic structure that differs greatly from English. This makes using English similar to working in a foreign language. It also results in significant limitations in English-language literacy that lead to the majority of deaf students leaving high school with reading levels at the fifth grade or below. In fact, the English vocabulary of the average 15-year-old deaf student is about the size of that of a 9-year-old hearing child and will not improve significantly (Karchmer & Mitchell, 2006). Consequently, students who are deaf or hard of hearing often miss many of the age-appropriate science and math learning experiences that provide the foundations for developing the understanding necessary for studying and/or majoring in STEM areas after leaving high school. This may contribute to the small proportion of deaf and hard of hearing people in STEM careers (0.13–0.19%) compared to the general population (11–15.3%) (National Center for Science and Engineering Statistics [NCSES] 1996, 2004, 2009, 2011).

As a response to this situation, TERC, an educational research and development organization, and Vcom3D, developers of SigningAvatar® assistive software, have been collaborating for more than a decade in research and development of universally designed signing dictionaries. Each dictionary contains a minimum of 750 content specific core-based terms and definitions, most of which include an illustration or example, and utilizes virtual characters—avatars—that sign. Windows-based Web versions and the plug-in are available free at <http://signsci.terc.edu/>. Apps are available through the Apple App Store on iTunes.

[Read article.](#)