



DO-IT

Creating Video and Multimedia Products That Are Accessible to People with Sensory Impairments

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DVDs, streaming video on the web, and films are engaging instructional tools. Everyone benefits from dynamic visual displays and dialog. Well, not everyone. Viewers who are deaf miss all audio content that is not also presented in a visual form. Those who are blind can access only the visual content that is also presented in spoken form. It is usually not difficult to make video and multimedia products accessible to viewers with sensory impairments, but special considerations should be made at the design phase to ensure complete access to everyone.

Universal Design

Including accessibility features when the product is being developed is much easier than providing accommodations to viewers with sensory impairments once they need to access the media. Building in accessibility features for all instructional products is in keeping with principles of universal design.

Universal design is defined by the Center for Universal Design at North Carolina State University as “the design of products and environments to be usable by all people to the greatest extent possible, without the need for adaptation or specialized design” (<http://www.design.ncsu.edu/cud/>). At the Center, a group of architects, product designers, engineers, and environmental design researchers established a set of principles of universal design to guide the design of environments, communications, and products. The principles ensure that the design accommodates a wide range of individual preferences and abilities; the design communicates necessary information effectively, regardless of ambient conditions or the user’s sensory abilities; the design can be used efficiently and comfortably, and with a minimum of fatigue; and appropriate size and space is provided for approach, reach, manipulation, and use regardless of user’s body size, posture, or mobility.

When designers apply these principles, their products can be used by people with a wide variety of characteristics. Expensive options for making the content of an inaccessible product accessible to people with disabilities can also be avoided when universal design is applied to its design. The following paragraphs provide strategies for creating accessible video and multimedia products. They are based on the experiences of DO-IT (Disabilities, Opportunities, Internetworking, and Technology) as it has created many accessible video productions, and the expertise of the professional organizations listed within this document.

Access for People who are Deaf

To experience watching a multimedia product without the ability to hear, turn off the volume on your television set or computer during a video presentation. Some programs, such as sporting events, are fairly easy to follow by watching the visual display. Others, such as news programs, make little sense without audio. To make this content accessible to those who are deaf, the program developer could arrange for a sign language interpreter or text captioning to appear on the screen. Captioning involves synchronizing text with audio content of a video presentation. It is more common than sign language because not all individuals who are deaf know sign language, there is no one standard version of sign language, and the intricate motions of sign language may be difficult to display clearly, especially when scientific or other highly specialized language is used.

Millions of people worldwide experience enough hearing loss to affect their ability to watch a television program at a standard volume level. Some people are born deaf or hard of hearing, some experience a hearing loss from an accident or illness, and many gradually lose their ability to hear. The elderly are the fastest growing group of individuals who are deaf or hard of hearing. Captions on video products allow these people to fully access educational and recreational programs with family, friends, and fellow students.



Although captions were developed to make video presentations accessible to viewers who are deaf and hard of hearing, they can also serve individuals for whom English is a second language. These individuals may find that printed English is more accessible than spoken English. People with certain learning disabilities can also benefit from hearing and seeing the spoken word simultaneously. For those learning to read, captioning has educational value; some instructors have found success with using captioned videos with the sound turned off to teach people how to read. Captions also provide content access to people viewing videos in noisy settings (e.g., airports, conference exhibits, restaurants) or in situations when it is important to be quiet (e.g., when a baby is sleeping or when viewing a video in a library).

Types of Captioning

Off-line captioning is developed once the video product has been created. The captioner types the captions, which are recorded on the video display. Captions typically appear on the screen as a group and erase as a group; they do not scroll. The captions are either “open” or “closed.” **Open captioning** appears on the screen whenever the video product is presented. It is particularly appropriate for products specifically designed for or about people with disabilities, (e.g., DO-IT videos).

Closed captions are stored in Line 21 of the vertical blanking interval (VBI) between the frames of a television signal and appear only when special equipment, called decoders, are used. Since 1993 all television sets thirteen inches or larger sold for use in the United States must have built-in decoders.

Real-time captions are simultaneously created during a video program presentation or meeting. They are most often used for live programs such as videoconferences and sporting events. Much like a courtroom reporter, a trained stenotypist enters spoken content by typing phonetic codes on a special keyboard that facilitates high-speed transcription. Computer software translates the phonetic codes into words that typically scroll across the bottom of the video image in a continuous motion.

Captioning is usually considered, if at all, after a video product is complete. However, to employ universal design the production should be filmed so that critical visual content does not appear where captioning will cover it. For example, if you are shooting an ice skating event, make sure the feet of the skaters are not so close to the bottom of the screen that they will be covered with captioned text. Keep in mind that captions should provide content for all of the visual events that occur on the screen, including noises that are not the result of speaking (e.g., a dog barking may translate into the captioned text “Dog barks.”). Suggestions from a variety of sources for making attractive and functional captions include the following:

- Use one or two lines of text.
- Caption the exact wording of speakers, including slang and grammatical errors.
- Only occasionally edit a few words to facilitate reading speed.
- Caption sound effects that contribute to the understanding of the content.
- Synchronize captions with the aural content.
- Only occasionally change the location of captions on the screen.
- Use a simple sans-serif font, such as Helvetica, and proportional spacing.
- Ensure high contrast between the text and background.
- Use both uppercase and lowercase letters
- Use italics to indicate the narrator, off-screen voices, sound effects, and other vital information presented aurally.

Legislation and greater awareness of individual needs has resulted in increasing numbers of video presentations available with captions. Many educational materials and most children’s and prime time television programs are closed captioned.

Captioning Resources:

AccessSTEM Knowledge Base (enter search text “caption as”) <http://www.washington.edu/doi/Stem/kb.html>

*Association of Late-Deafened Adults
<http://www.alda.org/>*



Caption Guide

http://www.dvdfile.com/site/faq/caption_guide/

Caption Services

<http://main.wgbh.org/wgbh/pages/mag/services/captioning/>

Caption Perfect

<http://members.aol.com/captioning/>

CaptionMax

<http://www.captionmax.com/>

Closed Captioning

http://en.wikipedia.org/wiki/Closed_captioning

Gallaudet University

<http://www.gallaudet.edu/>

Hearing Loss Association of America

<http://www.shhh.org/>

National Captioning Institute

<http://www.ncicap.org/>

National Court Reporters Association

<http://www.ncraonline.org/>

Rich Media Accessibility

<http://ncam.wgbh.org/richmedia/>

VITAC (Vital Access)

<http://www.vitac.com/>

Access for People who are Blind

People who are blind cannot access the visual content of a video production unless the content is available in audio or tactile format as well. Awareness of this access issue during the design phase of a product's creation can result in speakers or narrators voicing enough of the content to allow a person who is blind to follow along. This is particularly important for educational programming and products used with large audiences where it is unknown to the presenter what visual impairments audience members may have. Producers can listen to their video product without viewing the screen to help determine how

accessible it might be to a person who is blind. Credits and contact information provided at the end of the video can be spoken.

Audio Description:

Once a video product is complete, specially trained professionals can add audio content to the sound track. When pauses occur in the original production, the speaker reads titles, names and describes scenery, objects, and other visual information for the viewer who cannot see. Credits and contact information at the end of the production can be voiced in the original production or added as an audio described feature. Most video producers use outside services for audio description. Because this additional audio content is not of value to other audiences and can be distracting, audio description is usually not included with the standard product but is provided as an optional format as an accommodation when requested by a viewer. Providing this option is particularly important for products used in educational programs at all levels. Providing a talking menu on a DVD is another example of how a product can be designed to be fully operable by a person who is blind.

Audio Description Resources:

AccessSTEM Knowledge Base (enter search text "audio description")

<http://www.washington.edu/doi/Stem/kb.html>

Descriptive Video Service

<http://main.wgbh.org/wgbh/pages/mag/services/description/>

VITAC (Vital Access)

<http://www.vitac.com/>

Legal Issues

The **Americans with Disabilities Act** of 1990 (ADA) in the United States requires that public programs and services be accessible to people with disabilities, unless doing so would result in an undue burden. For example, the content of a video shown in a course might be made accessible to a student who is deaf by including captions. If the product is not captioned, access to the content



would need to be provided to the student in another way, perhaps by providing a sign language interpreter. Similarly, if a blind student enrolled in the course, the essential content that is presented visually could be spoken by an instructor or aide, or audio description could be provided as part of the product. Visit <http://www.usdoj.gov/crt/ada/adahom1.htm> for more information.

The **U.S. Television Decoder Circuitry Act** of 1990 requires that television sets with screens thirteen inches or larger manufactured for sale in the United States must have built-in closed caption decoders. This Act has made it possible for millions of people to display closed captioned televised materials in their home, workplace, and school. Visit <http://www.access-board.gov/sec508/guide/1194.24-decoderact.htm> for more information. To locate a technical assistance center in your state, consult <http://www.resna.org/taproject/at/statecontacts.html>.

Section 713 of the U.S. Telecommunication Act of 1996 resulted in many changes in the broadcast and cable television industries. Among other things, it charged the Federal Communications Commission (FCC) to create mandates to increase the percentage of television programming that is captioned. It has published rules and set guidelines for gradually increasing the number of captioned programs. Visit <http://www.fcc.gov/telecom.html> for more information.

Section 508 of the Rehabilitation Act of 1973 requires that the U.S. Federal Government develop, procure, maintain, and use electronic and information technology that is accessible to people with disabilities. In the Section 508 guidelines that were developed by the Access Board and became effective in 2001, all training and informational video productions that impart an agency's mission must contain captions for speech or other audio information necessary for the comprehension of the content. Also, critical visual content must be audio described. Although the standards were developed for the federal government, similar legislation and policies of states and organizations as well as voluntary compliance have extended

their use beyond federal agencies. Visit <http://www.access-board.gov/508.htm> for more information.

About DO-IT

DO-IT (Disabilities, Opportunities, Internetworking, and Technology) serves to increase the successful participation of individuals with disabilities in challenging academic programs and careers, such as those in science, engineering, mathematics, and technology. Primary funding for DO-IT is provided by the National Science Foundation, the State of Washington, and the U.S. Department of Education. This publication is based upon work supported by the U.S. Department of Education (Grant No. P333A990042) and the National Science Foundation (Grant No. 9800324). Any questions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the Federal Government. For further information, to be placed on the DO-IT mailing list, or to request materials in an alternate format, contact:

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