

Ethics and Access to Technology for Persons with Disabilities

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INTRODUCTION

The growth in technology has provided unprecedented access to information and experiences for persons all over the world. An Internet search yields volumes of information, personal digital assistants (PDAs) connect people with friends and information worldwide, and prosthetic devices provide both cosmetic effects and mobility for persons with a wide variety of orthopedic impairments. Although the current level of access to technology is a recent phenomenon, most people take these conveniences for granted. However, technology may be a mixed blessing for persons with disabilities and pose ethical dilemmas for developers who wish to provide global access for all.

BACKGROUND

Over 600 million people worldwide live with a sensory, physical, mental, or self-care disability that limits their ability to learn, work, and participate in daily activities (Heumann, 2004). Although assistive technology has become an important tool to provide persons with disabilities access to community, vocational, and leisure activities, mainstream technology such as computers, electromyographic (EMG)-controlled prostheses, cell phones, and handheld PDAs may require resources and skill levels that are beyond their reach and prevent them from accessing information and services. For example, persons with learning disabilities or visual impairments may not be able to read the text on Web sites. Persons with limited mobility may not be able to use their fingers to type, manipulate a computer mouse, or hold a cell phone. Also, many persons with disabilities cannot afford to purchase and maintain expensive assistive devices. As a result, accessible Web design and access to various assistive technology devices is needed to maximize information access for persons with disabilities.

The Alliance for Technology Access (ATA) asserts that all persons with disabilities are entitled to access to the information and technology needed to foster independence, employment, and leisure activities. ATA (2006) contends that:

- People with disabilities have the right to maximum independence and participation in all environments, without barriers.
- Technology can be harnessed to diminish or eliminate environmental barriers for people with disabilities.
- People with disabilities have the right to control and direct their own choices, and the right to access the information they need in order to make informed decisions according to their goals and interests.
- People with disabilities have the right to employ assistive technologies, strategies for implementation, and necessary training support to maximize their independence and productivity.

Furthermore, the IEEE Professional Communication Society Code of Ethics (1990) calls for members "...to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin" (p. 487).

Advances in information and communications technology (ICT) hold the potential to provide access to services and information for all persons with disabilities, however ICT specialists in the public and private sector often lack information on the needs of persons with disabilities. Also, institutional strategies and resource allocations seldom address the limitations and technological needs of persons with disabilities at different age levels and in various situations. For example, access issues for children often affect educational and leisure opportunities, while adults may be more concerned with workplace issues and independent living skills. Furthermore, populations of persons with

disabilities are heterogeneous and include a wide variety of skills and limitations.

Persons with Disabilities

Physical and cognitive disabilities pose different challenges as individuals attempt to access information and services. Physical disabilities affect about 3% of the population and include orthopedic, health, visual, and hearing impairments (Jones & Sandford, 1996). Persons with physical disabilities usually have the cognitive skills necessary to gain age-appropriate academic, social, and vocational skills; however, they often have limited mobility, health, sight, hearing, or the stamina needed to work for extended periods of time. The impact of physical disabilities may include paralysis, poor manual dexterity, low or distorted visual acuity, deafness, spasticity, weakness, and/or fatigue—all factors that affect access to information (Center of Information Technology, 2002-2006).

Assistive devices and disability-friendly Web designs that accommodate individuals with one or more disabilities help reduce the impact of their disability and improve their access to everyday living activities by providing assistance with communication and the self-help functions that increase their independence and sense of self-worth. Also various accommodations may serve one or more disability. For example, devices such as EMT control hands or limbs, text-to-speech synthesizers, audio and/or videoconferencing, and Braille displays and printers often equalize access for persons with both visual and orthopedic impairment (Hetzroni & Schrieber, 2004). Web sites that provide all visual information in text and sound, allow mouse-free navigation, and limit the use of color for distinguishing information help serve the needs of persons with visual, hearing, and health impairments.

Cognitive disabilities affect about 8% of the population and include learning disabilities, mental retardation, emotional disorders, attention deficit disorders, and speech/language impairments. Persons with cognitive disabilities experience a broad range of skills and limitations. For example, persons with learning disabilities or speech/language impairments often have average to above average intelligence, but may lack the visual and/or auditory processing skills needed to gain age-appropriate academic and/or social skills. Persons with attention deficit disorders or emotional disorders also have average intelligence, but

often lack the self-regulatory and self-management skills to engage in age-appropriate behaviors. Persons with mental retardation usually have poor cognitive and adaptive behavior skills. As a result, most persons with cognitive disabilities lack the reading, writing, and language skills needed to process and comprehend the text, language, graphics, and/or mathematics that are commonly needed to utilize technology.

In spite of the diverse impact of cognitive disabilities, the common characteristics affect information processing. Visual and/or auditory processing deficits can adversely affect a person's ability to use e-mail, instant messages, and Web sites. Persons with cognitive disabilities usually need additional training, practice, and supervision to gain the skills needed to understand directions and the use of assistive devices. They may need a screen reader plus synthesized speech to facilitate comprehension, captions to help understand an audio track, reduced distractions like animations to help focus their attention, or a consistent navigational structure throughout a site (Samuelsson, Lundberg, & Herkner, 2004; Gunderson & Jacobs, 2000). Also, software like Inspiration assists in organizing displays and information by using symbolic and a variety of graphical displays that facilitate understanding large amounts of information (Inspiration Software, 2006).

Issues with Access to Technology

The ATA maintains that society's attitude towards persons with disabilities is the greatest barrier to inclusion of persons with disabilities in the "Information Age." And, the National Telecommunications and Information Administration (2000) contends that the "digital divide" is a chasm for persons with disabilities. Lack of information about the availability of assistive technology, expensive equipment, and inconsistent standards for Web design and applications prevents persons with disabilities from accessing the technology that they need to gain independent living skills. Also, persons with disabilities in undeveloped countries are often unaware of and cannot afford assistive devices.

Thousands of simple and complex assistive technology devices exist. Talking pens read words to the writer as he or she pens thoughts and ideas. Electric page turners, headwands, and light pointers enable persons with limited mobility to read independently. Computer keyboards with large letters and monitors with magnified screens help persons with low vision

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