

## Chapter 12

# Assistive Technology for Deaf and Hard of Hearing Students

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### ABSTRACT

*Although the majority of deaf and hard of hearing (d/hh) students are educated in the public school system (Turnball, Turnball, & Wehmeyer, 2010) there is limited research and literature regarding how educators can effectively meet their educational needs by implementing assistive and instructional technologies into their curriculum. This chapter provides an overview of the various assistive and instructional technologies available to d/hh students and outlines how these students access and use technology. This chapter contributes to the fundamental ideal that integrating assistive and instructional technologies can greatly enhance the academic and social outcomes for d/hh students. It should be noted, that the Deaf community does not adhere to person first language because they do not view deafness as a disability but as a culture.*

### INTRODUCTION

There is a new emphasis, based on federal mandates (discussed next), concerning and redefining “highly qualified teachers.” Educators of deaf and hard of hearing (d/hh) students have historically been classified as “highly qualified” upon earning a state license from an approved deaf education program (Luft, 2008). Within the last 20 years the preparation of educators for d/hh students has become an

increasingly difficult and complex process because it is intertwined with theories, knowledge, and skills related to deaf education, academic content, and other pedagogical areas (Paul & Quigley, 1990). Nevertheless upon graduation preservice educators were deemed “highly qualified.”

Unlike the 1997 amendments to the Individuals with Disability Education Act, the reauthorization Individuals with Disabilities Improvement Act (IDEIA, 2004) required special educators to earn a disability-specific degree. Similarly, the No Child Left Behind Act (NCLB, 2002) has redefined the

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criteria for “highly qualified” (Smith, Desmone, & Ueno, 2005). Although NCLB has six key principles (Turnbull, Turnbull, Erwin, & Soodak, 2006), the focus of highly qualified teachers and accountability have specific and new implications for d/hh educators.

In order to achieve the mandates of NCLB (2002) and IDEIA (2004), d/hh educators must have an in-depth understanding of both assistive technology (AT) and instructional technology (IT). When implemented with fidelity, AT and IT have the potential to increase the academic and social outcomes of d/hh students. Moreover, in alignment with IDEIA (2004), upon transiting from K-12 educational setting to either postsecondary institutions or cooperate America, d/hh individuals are ensured reasonable accommodations and modifications according to the American’s with Disabilities Act (ADA, 1990), which would include appropriate AT and IT (Rosen, 2007). Unfortunately a significant gap exists between empirical research and descriptive studies that report the efficacy of AT or IT use for d/hh students in the K-12 setting.

The limited numbers of studies that have been conducted on AT and IT were completed at the K-12 level during the 1990s and mainly focused on cochlear implants. More recently Power, Power, and Horstmanshof (2007) reported that there is a dearth of research, studies, and published literature related to the ways d/hh community use technology. The lack of research, access, and understanding poses clear challenges for educators, d/hh students, and their families. Therefore, the purpose of this chapter is to provide an overview of various educational technologies for this student population.

## **BACKGROUND**

In our society, technology rapidly changes our lives; this is particularly true within the deaf and hearing community (National Association of the

Deaf, 2008). For example, less than two decades ago d/hh Americans had to rely on neighbors or relatives to make a simple phone call (National Association of the Deaf, 2008). However, the rapid advancements in technology have been vital for increasing the life outcomes of individuals with a hearing loss.

In a society oriented to speech and hearing communication, technology has aided and allowed d/hh individuals to become more independent and active participants. Moreover, advancements in technology have been made specifically to meet the unique needs of d/hh individuals. Similar to Universal Design for Learning, many technological advances that were specifically designed for d/hh individuals provide benefits and convenience for everyone. For example, closed captioning was one dimension of technology specifically designed for d/hh individuals. However, the benefits of closed captioning are virtually limitless for the “hearing world.”

This accommodation/modification and newer innovations such as the teletype (TTY), various alerting devices, improved hearing aids, assistive listening devices (ALD), and fax machines have positivity impacted the d/hh and “hearing world” simultaneously (Stewart & Kluwin, 2001). Additionally, Stewart and Kluwin (2001) reported that e-mail and on-line chats, videophones, videoconferencing, speech-to-text software, text-to-signs software, and palm-size pagers with key boards were created to meet the communication needs of d/hh people, yet these developments benefit everyone.

## **Effects of Technology on d/hh Students**

To increase the academic achievement and socialization, for a subgroup that is typically known for their low reading levels and underachievement, current and future educators need to have in-depth knowledge about (a) communication, (b) language, (c) social emotional, (d) educational,

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