

Mobile Phone: Repurposed Assistive Technology for Individuals with Disabilities

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INTRODUCTION

Mobile phones are here to stay, including their use by children and adults. For example, recent surveys found the majority of US school-aged children possess their own mobile phone, and increasingly those mobile phones are smartphones (Banks 2008; Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013; Rideout, Foehr, & Roberts, 2010). Internationally (e.g., the United Kingdom, Asia), the majority of school-aged children also possess their own mobile phone, including smart phones (mobiThinking, n.d.; Yapp, 2012). For most individuals, mobile phones are used for communication (e.g., text and voice), and increasingly to access the Internet (e.g., websites, email) and to run apps. However, for individuals with a disability mobile phones can be more; mobile phones can be repurposed to serve as assistive technology.

The idea of repurposing a technology to serve a function outside its original intention comes from the Technological Pedagogical and Content Knowledge (TPACK) framework by Punya Mishra and Matthew Koehler (2009). Mishra and Koehler (e.g., Kereluik, Mishra, & Koehler, 2011; Mishra & Koehler, 2007, 2009) argued the typical technologies used in education were not designed with education in mind. Rather, teachers repurposed

technologies for educational purposes. In other words, educators – thinking outside of the box – re-imagined, reconfigured, and adapted typical technology to be useful in educational settings (Kereluik et al., 2011; Mishra & Koehler, 2007).

Technology can be repurposed to a specific type of educational technology – assistive technology (Blackhurst, 2005a, 2005b; Bouck, Flanagan, Miller, & Bassette, 2012; Bouck, Jasper, Bassette, Shurr, & Miller, 2013; Bouck, Shurr, Tom, Jasper, Bassette, Miller, & Flanagan, 2012). Assistive technology devices, according to federal law, are defined as, “any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability” (IDEA, 2004, I.A.602.1). In other words, assistive technologies are tools that support individuals with disabilities in their functioning (e.g., academic and life). Given the rather ambiguous definition of assistive technology, these devices can run the spectrum – from low-tech (e.g., pencil grips, raised line paper) to medium- or mid-tech (e.g., calculators) to high-tech (e.g., speech-to-text and text-to-speech programs; Blackhurst, 1997; Edyburn, 2005; Johnson, Beard, & Carpenter, 2007; Vanderheiden, 1984). Assistive technology

devices can also be classified along the lines of purposes, such as the seven suggested by Bryant and Bryant (2003): positioning, mobility, augmentative and alternative communication (AAC), computer access, adaptive toys and games, adaptive environments, and instructional aids.

Repurposing assistive technology refers to using technology not intended to be assistive – such as a mobile phone – and using it to be assistive technology for an individual with a disability (e.g., Bouck, Flanagan, et al., 2012; Bouck, Jasper, et al., 2013; Bouck, Shurr, et al., 2012). Repurposing everyday technology to be assistive technology benefits individuals with disabilities as this technology is usually more affordable, easier to find, and requires less specialized training (Bouck, Flanagan, et al., 2012; Bouck, Shurr, et al., 2012; Cihak, Kessler, & Alberto, 2008; Parette & Scherer, 2004).

OVERVIEW

One such everyday technology repurposed to be assistive technology is the mobile phone (Bouck, Flanagan, et al., 2012; Bouck, Shurr, et al., 2012; Cihak et al., 2008). For individuals with disabilities, mobile phones can serve a variety of functions, including – but not limited to – communication (e.g., calling and texting), calendar and alarm features for self-monitoring, acting as a calculator, supporting independence, delivering prompts, and serving as an augmentative and alternative communication (AAC) device (Bouck, Flanagan, et al., 2012; Ferriter, 2010; Flores et al., 2012; Mechling, Gast, & Seid, 2010; Mechling & O'Brien, 2010; Taber, Alberto, Hughes, & Seltzer, 2002; Taber, Alberto, Seltzer, & Hughes, 2003; Walser, Ayres, & Foote, 2012).

To date, most research on the use of mobile technologies, such as mobile phones, concentrates on how to support individuals identified with moderate-to-severe intellectual disability or autism spectrum disorder (e.g., Ayres, Mechling,

Sansosti, 2013; Mechling et al., 2010; Mechling & O'Brien, 2010; Taber et al., 2002; Taber, et al., 2003; Walser et al., 2012). The use of mobile technologies tends to be the preferred instructional delivery method with this population of individuals, although mobile phones can certainly support individuals with more high-incidence or mild disabilities (Ayres et al., 2013). The preference towards mobile technologies for individuals with disabilities may, in part, be due to the desirability and less stigmatizing effects of mobile technologies – including mobile phones (Bouck et al., 2012). Within the limited research to-date, individuals with disabilities benefit from use of mobile phones to support their independence, as a delivery mechanism for prompts, and an AAC device (Ayres et al., 2013).

CURRENT SCIENTIFIC KNOWLEDGE IN MOBILE PHONE USE FOR INDIVIDUALS WITH DISABILITIES

The current scientific knowledge base for using mobile phones with individuals with disabilities is limited, and what does exist tends to focus on students with significant disabilities, such as students with moderate-to-severe intellectual disability or autism spectrum disorder. While limited, the research base in this area creates great potential for future scholars to explore many ways in which mobile phones can support and enhance the lives and education of individuals with disabilities. Within the limited literature, Linda Mechling (e.g., Mechling, Gast, & Seid, 2010; Mechling & O'Brien, 2010) is a leading researcher examining the use of mobile technologies – including but not limited to mobile phones – to support students with disabilities in acquiring greater independence through prompting. When considering smartphones, Kevin Ayres (e.g., Bereznak, Ayres, Mechling, & Alexander, 2012; Wasler, Ayres, & Foote, 2012) is a leading researcher evaluating the use of iPhones to teach

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