

Improving Educational Outcomes Through Assistive Technology

Joseph E. Campbell 23 March 2017

Summary

Children with disabilities are entitled to a free and appropriate special education. These children may receive services from a number of professionals, including physical, speech and occupational therapist to ensure they are able to participate in and benefit from their special education program. For many of these children, traditional lecture-based instruction does not maximize learning potentials. This article calls on therapists and special educators to embrace and fully support students' use of assistive technology in support of their education. This support has to include training the student and support staff to use the technology and it should include implementation and outcomes-based research to identify how and for whom technology is appropriate.

Is it cheating to use a calculator to answer math questions on a school assignment or test? Is it cheating to have a computer or tablet read a text to a student and then to read comprehension questions to the student for him or

her to answer? Is it cheating to type answers to a spelling test while the rest of the class handwrites answers? Is it cheating to wear glasses while you copy notes from the board in front of the class? It is unlikely that anyone would ask the latter question. Perhaps however, people might ask the former questions. Graham and Richardson argue that more resources are needed to show educators and administrators how technological adaptations can serve to dramatically level the academic playing field, especially for some of the most vulnerable students.¹ Special education should be about providing students with the resources and strategies they will need as they transition from high school age children to young adults who can be as employable as possible, participate in post-secondary education or vocational training, and to live as independently as possible.

There is a wide range of technology available to help level the education playing field. This technology could be categorized as educational technology versus assistive technology. Educational technology includes software, projection boards, computers and web-based sites that allow teachers to augment lecture and other traditional teaching strategies. With these technologies, teachers are able to bring the world into the classroom. Woods Services (Woods) is an organization in Langhorne, Pennsylvania that, along with its affiliates in Pennsylvania and New Jersey, offers a continuum of services to 3,600 children and adults with disabilities. Woods has made a

commitment to bring educational technology to the students served in its licensed private schools. Teachers use projected technology to engage students in current events such as the recent presidential debate, historical events such as the speeches of Dr. Martin Luther King, Jr. during Black History Month, or to learn about animals saved by renewable palm oil efforts of people around the globe. Students are also able to use this technology to manipulate numbers and data on a board to enhance their understanding of math, science and reading materials. Woods is also committed to bringing assistive technology products and services to the people served in its programs.

Assistive technology is defined as any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.² Therapists and educators further differentiate assistive by complexity, i.e., low, mid, and high technology; and by purpose, e.g., communication, mobility, self-care. Low technology includes items that are low in cost and or easy to fabricate such as a pencil grip to improve fine motor skills for writing or a slant board to hold a book upright for a student who cannot hold it. Mid technology includes items that are not so easy to build but are not terribly expensive. A single message speech generating device might fall into this category. High technology includes those expensive

items that often need insurance, funding or grants to underwrite the expense. Included in this category are items such as power wheelchairs, dynamic speech generating communication devices, screen and text reading devices, and eye gaze systems for communication or computer access. Use of assistive technology does not give someone an unfair advantage; rather, it gives people with disabilities an opportunity to engage in the activities that are meaningful. It is important for families, teachers, therapists, and others to support individuals in getting the maximum benefit from the technology.

At Woods, individuals use technology to support many aspects of their daily living. School age and adult residents use a range of wheelchairs and mobility devices. A very active physical therapy department assesses residents' mobility needs, advocates for the most appropriate device, writes letters of medical necessity to procure insurance funding, trains the residents to use the device, trains staff to help support the residents, and ensures the equipment is maintained for use and safety.

This level of mobility equipment management by skilled physical therapists helps to reduce the risk of falls and pressure sores. It has also helped to ensure residents are able to get to school, get around school, participate in paid vocational opportunities, get to and around the community, and otherwise engage in life activities that are meaningful to them. This level of expertise and support

may not be available to people with disabilities living in other environments. Jirikowic and Kerfeld write that, because children who use adapted equipment for mobility face higher rates of inactivity and obesity, they benefit from health promoting physical activities.³ Using this approach, we have seen some residents at Woods thrive because of the skilled intervention services offered in therapy, education, and residential programming. One resident came to Woods Services in a state of clinical obesity, unable to walk and using a wheelchair for all mobility needs. With a strong effort to strengthen core and skeletal muscles, a structured diet program and a lot of work by the resident himself, within months of admission, he had lost weight, was standing, and taking steps and eventually using a walker. For musculoskeletal health, this was a major benefit for the resident. He still uses assistive technology for mobility; however, the ability for him to stand and walk adds greatly to his skin integrity, cardiovascular and bone health.

Speech Language Pathologists (SLP) at Woods Services work with individuals to improve communication skills using a range of alternative and augmentative strategies. Solutions can be no tech, e.g., use of sign language; low tech, such as using pictures to exchange between communication partners; mid tech devices such as a switch with a single recorded message like, I need to use the bathroom; high tech solutions include dynamic speech generating devices that an individual might

activate by looking at the device's display screen. These therapists also advocate strongly on behalf of residents to get funding for these very necessary and sometimes expensive devices and systems. Some of the higher end devices can cost several thousands of dollars. To maximize the benefit from alternative and augmentative communication systems, the SLPs work across campus to train residents, teachers, and support staff to use the systems. The challenge sometimes is to convince people that while a new communication system might be harder to use initially, with a concerted effort the systems will allow residents to communicate to a higher potential.

Occupational therapists work with residents at Woods to use assistive technology to hold pencils, pens, and crayons to write with a more mature grasp and with greater legibility. Residents are also using computers, tablets, and keyboards as alternative to handwriting. Residents are assessed for the need of safety equipment in bathrooms such as shower chairs. Low tech items such as elastic laces are issued to residents. This simple solution allows an individual to go from needing staff support to tie shoes, to being independent with donning shoes.

Teachers advocate for technology. Some are early adopters of available and recommended technology. Newer teachers bring ideas they have learned of from their education programs and or student teaching experiences. More seasoned teachers bring a wealth of

experience that sometimes includes the use of technology. It is sometimes the teachers who are the drivers of innovative approaches using technology.

While all of these professionals have experience and expertise, it can still be challenging to get agreement on how to improve educational outcomes. Some have argued that to use a speech generating device will discourage nonverbal children from learning to speak. Studies have shown, however, that the opposite is true; speech generating devices may facilitate the development of speech.⁴ Anecdotally, this author has heard professionals argue that children who write with very poor legibility need to practice more and thus should not be using keyboards to produce written work or to take spelling tests. The counter argument is, why wait? What if significant improvements in handwriting never occur? From a developmental perspective, it might be more beneficial to the student to separate handwriting from spelling and producing written work. Allow the students to demonstrate what they have learned through the most efficient means available to them.

Similar arguments have been made against students using technology to complete math assignments. Teachers rightly argue that it is important for students to develop automaticity with math, memorizing math tables and facts so that they can quickly access that information to complete advanced math functions. Another argument, however, is that for some students it might be more

important to learn math problem-solving strategies early rather than waiting to see if they can learn to memorize the multiplication table. At Woods, students have access to regular calculators and large button calculators to accommodate needs related to fine motor or visual impairments. Other students with low vision and/or intellectual disabilities utilize talking calculators that confirm which buttons they have pressed and the total calculations. This author advocates allowing students with disabilities to use calculators in class and on tests. If the goal is to be able to use math in everyday lives, it is more important for students to develop strategies to use the tools that will get the correct answers.

There is a lack of empirical studies demonstrating the effectiveness of assistive technology.⁵ Providers of assistive technology products and services have long relied on the anecdotal, single subject reporting of the success assistive technology has on improving the lives of individuals. At Woods Services, technology has allowed residents to be employable who otherwise could not, to get onto the internet, to write a paper for class, to speak to a mom, to self-advocate, and to enjoy hobbies such as taking pictures. What is needed, however, are more successful applications of assistive technology products and services to serve the greater community of people with diverse abilities. More success will not only make technology use more acceptable but will allow providers to better prescribe the correct technological solutions.

To meet the educational, vocational, and residential needs of a heterogeneous population of people with disabilities, education professionals must be willing to provide an array of options to engage children in their individualized education program. Likewise, there needs to be an acceptance of different options for acceptable outcomes.

A recent rally in Harrisburg, Pennsylvania illustrated the need for options as more than 1000 people with disabilities, including some who are supported by Woods Services, made it known to political representatives of the need for a continuum of employment options, including sheltered and supported employment. So, too, must there be a range of options for students to learn and to demonstrate to teachers, families, and employers not only their abilities, but their value to their families and communities. Assistive technology does not help people cheat; it gives people of diverse abilities opportunities to participate in meaningful life experiences.

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