

Teaching with iPads for Students with Multiple and Visual Impairments

You are a teacher of students with visual impairments (TVI) and have just recently learned you will have a new student named Margaret.

Her family is very involved with her educational program and excited about her learning how to use an iPad.

Margaret is a sixth grader with cerebral palsy and visual impairments. Her visual impairment is Retinopathy of Prematurity (ROP). She has partial bilateral retinal detachments, which impact her vision with blank and black areas in her central and peripheral vision and spatial distortions. She uses a power chair for mobility, but has limited motor ability in her hands. She has a one-on-one aide who reads almost all her work to her. She currently uses a video magnifier for enlargement, but not regularly. She advocates for herself by letting her assistant know if she is unable to see the materials. Her primary learning media is auditory, but her goals suggest she would like to use her visual skills as much as possible; she is a large print reader. Her other needs are high contrast materials and preferential seating. Her interests are reading novels, such as the Twilight Series, listening to music and talking to her friends. Margaret controls her wheelchair independently and uses a long cane for travel. She may benefit from a stylus with her iPad and the team should consider mounting the iPad to her wheelchair.

Margaret's story is a familiar one and an iPad is an ideal assistive technology option. Assistive technology (AT) is a universal equalizer, providing VI students far greater access to information using available accommodations, such as screen readers and video

magnifiers (Kapperman & Sticken, 2000; Presley & D'Andrea, 2009). Despite the attention given to technology and, most recently iPads, in the field of visual impairment, students with visual and multiple impairments still lack adequate access to assistive technology. Research studies consistently report less than 50 percent of students with visual impairments are utilizing AT for reading, learning or researching (Kelly, 2011; Lewis & Edwards, 1998; Johnstone, Altman, Timmons, & Thurlow, 2006; Kapperman, Sticken & Heinze, 2002; Kelly & Wolffe, 2012). Kelly and Wolffe (2012) found that only 42 percent of the transition students [students ages 18-22 working on post-secondary, adult living skills] with visual impairments were using the Internet regularly. Students with visual and additional impairments have even lower rates of assistive technology use (Copley & Ziviani, 2004). Students like Margaret need a comprehensive AT plan that will address their unique abilities.

AT has improved the lives of students and adults living with visual impairments by providing access, connectedness and engagement. AT is one of the nine areas of the Expanded Core Curriculum (ECC) used to help guide the instruction in the field of visual impairment (Hatlen & Sapp, 2010). Instead of separating AT as one unrelated component of a student's program, the iPad



TARA MASON, TVI, M.Ed. is a Ph.D. Candidate in Special Education at Texas Tech University, specializing in visual impairment and assistive technology. She serves as a university supervisor of TVI Candidates in Texas for TTU, as a teaching assistant for graduate level courses, and as a researcher on projects related to visual impairment. Tara previously worked as a TVI at the Texas School for the Blind and Visually Impaired for several years. Additionally, she is a certified special education teacher and certified to work with students who are English Language Learners. Tara is the founder and lead consultant for New Tech for Ed, an assistive technology consulting company facilitating professional development and program evaluation of technology programs for students who have multiple impairments (www.newtechford.com). Contact info: tara.mason.ttu@gmail.com

offers educators an opportunity to integrate AT throughout a student's program at school and home. This integrated ECC and iPad strategy can be applied to meet Margaret's need, as illustrated in Table 1.

ACTION PLAN

Zabala's framework (2012), which includes the components of Student, Environment, Task and Tool (SETT), can be used to address Margaret's unique needs by developing a set of specific iPad goals linked to the ECC. A stylus will provide Margaret greater touch screen access. For better general accessibility, the iPad needs to be mounted to Margaret's wheelchair. RJ Cooper (<http://www.rjcooper.com>) has a large selection of wheelchair mounts that may work well for Margaret. When positioning the iPad, the teacher (or the TVI) needs to consider the following:

- Field preference: position the mounted iPad where Margaret sees best. Too often, students with visual impairments are hunched over looking at iPads on a flat surface.
- Glare: watch for issues around too much reflection or changes in lighting that will affect how easy it is for Margaret to see the screen
- Clutter: separate apps into folders and use Apple's Large Text to make it easier to target items. For Margaret, we know that she experiences spatial distortions, which can be confusing when trying to interpret visual information.
- Landmark: Placed by the TVI, tactile bump dots landmark the home button, microphone and camera for increased efficiency and targeting for repeated tasks.

IMPLEMENTATION

The action plan for Margaret will include instructional steps and a long-term curriculum plan. Without thoughtful individualized planning, the AT implementation may not be fully effective. In order for the iPad to be an effective learning device for Margaret, the following key components must be included in the implementation plan (adapted from the Quality Indicators for Assistive Technology, 2012; Zabala, 2007):

- iPad use must be implemented across Margaret's school day;

Table 1: Margaret's iPad and the Expanded Core Curriculum

Expanded Core Curriculum Area	Margaret is low vision with multiple impairments (Margaret's Apps)
Compensatory Academic/ Functional Academic including Communication Modes	Pages will be used as a word processing app for Margaret to complete her class assignments.
Orientation and Mobility (O&M)	Maps with a stylus will be used for Margaret's O&M and additionally, taking a screen shot of the map will make it accessible when out of Wifi range.
Social Interaction Skills	Facebook with Siri will be used to socialize with her peers and she can post status updates by commanding Siri to "Post a status update to Facebook."
Independent Living Skills	iCal with stylus will be used to keep track of her appointments and prepare her for transition to post-secondary life.
Recreation and Leisure Skills	Read to Go will be her reading app with which she can access audio books for her recreation and leisure time. Additionally, Read to Go will enable Margaret to read her textbook assignments independently instead of having her aide read to her.
Career Education	Email will give Margaret great practice towards post-secondary life and for emailing assignments.
Assistive Technology	Bigger and Brighter will give Margaret a way to enlarge print in her community, such as menus or forms.
Visual Efficiency	Penultimate will provide an interactive drawing and notetaking app for Margaret. With Penultimate, Margaret can photograph a worksheet, zoom in on it, modify it and email.
Self-Determination	Safari will be Margaret's research and connectedness tool. She can look items up, using the "reader" function, when available, to easily read (listen to) articles with VoiceOver.

- iPad training must be collaborative, involving Margaret's one-on-one aide, parents and all other educational team members;

Plan must include easy-to-follow instructions and troubleshooting advice with hardware and/or software recommendations;

All team members must consistently communicate information about Margaret's iPad use and utilize progress data in order to make evidence-based decisions.

PRACTICAL APPLICATION OF THE PLAN

When the plan is ready to be implemented, a strategic approach should be used to introduce any new AT software or hardware. Figure 1 illustrates an instructional sequence to introduce software or hardware to the student:

1. The new device or software is introduced and discussed.

The device or technology is then modeled with verbal descriptions or “teacher talk,” depending on what is appropriate. For instance, if the student would benefit from knowing the reason for choosing an application, “teacher talk” should be used while modeling such as saying, “I need to jot down that appointment in my calendar before I forget it, so I will open up iCal to make sure it is on my schedule.”

The next step is to scaffold, where the student is helped in the use of an application or hardware with hand-under-hand instruction, if necessary.

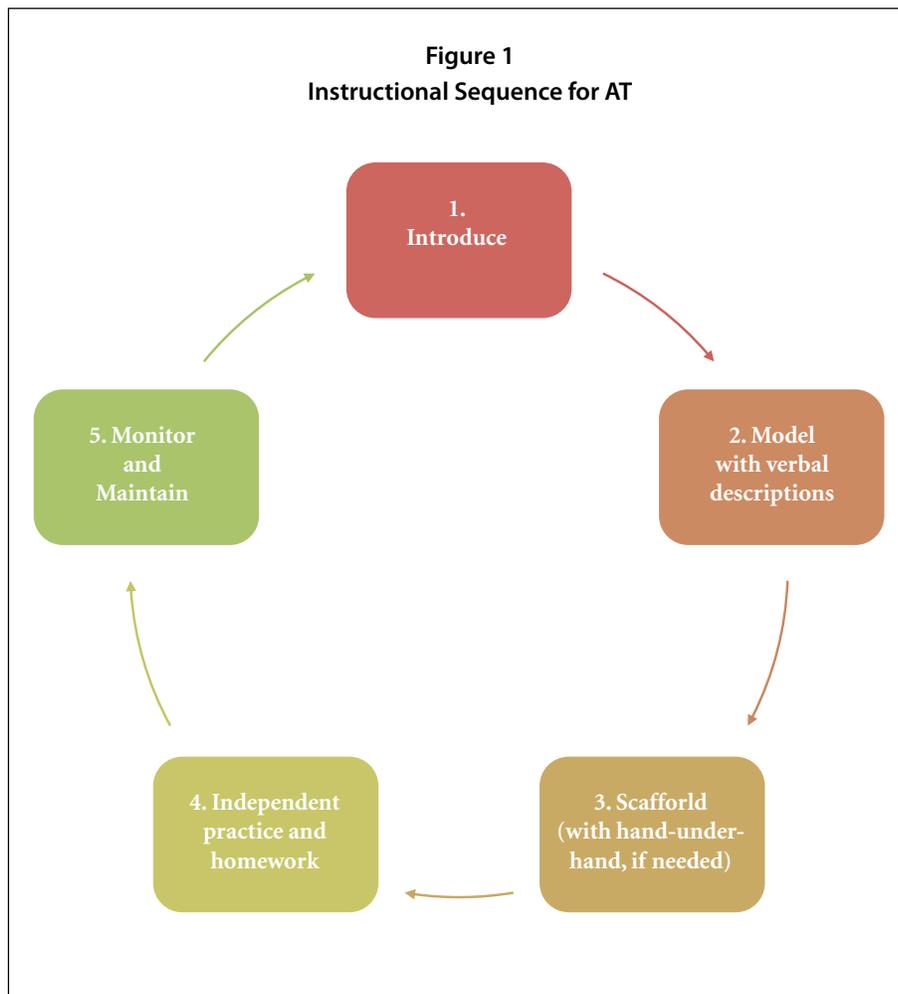
Once the student has practiced with help, the student should be allowed individual practice, which is potentially the most important step of the instructional sequence. When a student is practicing independently, it is important not to take the iPad if something is not working correctly. It is best to help a student troubleshoot the issue. If all troubleshooting fails, then ask if you can take a look at the iPad. (Note: If troubleshooting is needed, grabbing the iPad to fix an issue may send the message to a student that they will not be able to truly navigate an iPad on their own).

The last step in the instructional sequence is to monitor and maintain the iPad. Some examples of this may be that during one-on-one meetings with a student, the teacher checks in or asks the student to demonstrate a task on the iPad. Additionally, monitoring iPad use can include collaborating with team members on a periodic basis to ensure the iPad is integrated throughout the school-day. This is also an opportunity to make sure a student is taking care of his or her iPad. Questions to ask are, “Have you been updating your applications? Have you been experiencing any issues or roadblocks with your iPad?”

MOVING FORWARD ... MARGARET’S PLAN LONG TERM

When implementing AT for students, it must be integrated into the student’s educational plan and future-focused. The question is: How well will this device serve a student right now and in the long term? The iPad is a mainstream, socially appropriate, multi-functioning device that will be less likely to be discarded (Alper & Rahiriniaria, 2006).

Using Margaret’s program needs as a guide, a suggested lesson order for a TVI, special



education teacher or related service professional is presented in Table 2.

SUMMARY AND IMPLICATIONS

When using iPads as a teaching and learning device for a student, stay focused on what it can do. Also consider that there may be a workaround for something a student wants to do with their iPad that does not seem instantly accessible. The iPad is a mainstream device that most students are highly motivated to use. Students who have low vision may be able to use their iPads in several ways in the classroom, for example, taking a picture of the board in order to zoom in on it, that will promote independence and accessibility.

Some cautionary advice is also important when considering using iPads. For younger students who are pre- or early-symbolic communication learners, iPads do not replace real objects or tactile symbols. With the ECC in mind, iPads are an effective tool for cause and effect, expressive or receptive communication, visual stimulation and

learning games. Any “native” Apple applications will be the most accessible using VoiceOver since Apple apps will have labels on nearly all the buttons and graphics. An application from a non-Apple source may not be totally accessible but there may be workarounds that make the app worth using. When there are iOS updates, changes may occur in the functionality of an app and workarounds may be needed for inaccessible features.

In conclusion, what the iPad can do far outweighs what it cannot do. Students with visual impairments deserve equal opportunity and the ability to choose what AT will work best for them, depending on the task they are trying to accomplish and their educational goals.

REFERENCES

Alper, S., & Rahariniaria, S. (2006). Assistive technology for individuals with disabilities: A review and synthesis of the literature. *Journal of Special Education, 21*(c).

Table 2: Suggested Lesson Order

Lesson #1: Introduce the iPad	Go over hardware accessibility: Triple click home button, camera for zooming in and screen shots (home and sleep button quick simultaneous push)
Lesson #2: Accessibility features	Go over software - VoiceOver, Zoom, Large Text
Lesson #3: Accessibility Apps	Bigger and Brighter and Read to Go
Lesson #3: Safari	Essential features: home bar, tabs, home screen links to Web pages, searching
Lesson #4: E-mail and Facebook	(1) Have student email you by adding you to their contacts (2) Show basic features – flagging, reply, forward, printing, compose, and set up email “behaviors” (3) Go over functions and behaviors of Facebook and practice status update with Siri
Lessons #5, 6, & 7	Introduce iCal, Reminders, Maps, Camera and Pages
Lessons # 8, 9 & 10	(1) Monitor and Maintain the iPad and continue to practice with apps (2) Download only one or two new apps each week, where applicable, (Note: remember that iOS apps will be required to be more accessible than non-native Apple apps)

Apple, Inc. (2013) Apple Accessibility Guide. Retrieved from <http://www.apple.com/accessibility/>.

Copley, J., & Ziviani, J. (2004). Barriers to the use of assistive technology for children with multiple disabilities. *Occupational Therapy International*, 11(4), 229-243.

Edwards, B. J., & Lewis, S. (1998). The use of technology in programs for students with visual impairments in Florida. *Journal of Visual Impairment & Blindness*, 92(5), 302-12.

Johnstone, C., Thurlow, M., Altman, J., Timmons, J., & Kato, K. (2009). Assistive technology approaches for large-scale assessment: Perceptions of teachers of students with visual impairments. *Exceptionality*, 17(2), 66-75.

Kapperman, G. & Sticken, J. (2000) Chapter 14 assistive technology. *Foundations of Education (2nd ed.): Volume II Instructional Strategies for Teaching Children and Youths*

with Visual Impairments. New York: AFB Press.

Kapperman, G., Sticken, J., & Heinze, T. (2002). Survey of the use of assistive technology by Illinois students who are visually impaired. *Journal of Visual Impairment & Blindness*, 96(2), 106-08.

Kelly, S. M. (2009). Use of assistive technology by students with visual impairments : Findings from a national survey. *Journal of Visual Impairment and Blindness*, 103(8) 470–481.

Kelly, S. & Wolfe, K. (2012). Internet use by transition-aged youths with visual impairments in the United States: Assessing the impact of postsecondary predictors. *Journal of Visual Impairment and Blindness*, 106 (10), 597-608.

Koenig, A. & Holbrook, M. C. (Eds.). 2000. *Foundations of Education (2nd ed.): Volume II Instructional Strategies for Teaching Children and Youths with Visual Impairments*. New York: AFB Press.

Presley, I., & D’Andrea, F. M. (2009). *Assistive technology for students who are blind or visually impaired: A guide to assessment*. AFB Press.

QIAT, Quality Indicators for Assistive Technology Services (2013) *Guiding the Provision of Quality AT Services*. Retrieved from <http://indicators.knowbility.org>.

Sapp, W., & Hatlen, P. (2010). The expanded core curriculum: Where we have been, where we are going, and how we can get there. *Journal of Visual Impairment & Blindness*, 104(6), 338-348.

Zabala, J. S. “The Development and Evaluation of Quality Indicators for Assistive Technology Services (2007). University of Kentucky Doctoral Dissertations. Paper 517. Retrieved from http://uknowledge.uky.edu/gradschool_diss/517

Zabala, J. S. (2012). The SETT framework : Critical areas to consider when making informed assistive technology decisions, 1–5. (I retrieved this from: <http://secure.edc.org/ncip/workshops/sett3/SETT.htm>) ■