

Closing The Gap

DECEMBER, 2013 / JANUARY, 2014
VOLUME 32 - NUMBER 5

Solutions

**The New Common
Core State Standards
Assessments: Building
Awareness for Assistive
Technology Specialists**

**Easy and Effective Ways
to Communicate and
Participate With AAC
Apps on iDevices**

**DISKoveries -
Technology Tricks**

**How Much is Your Time
Worth? Turning an
Adapted Computer User
into a Power User**

**A Model for Successful
Assistive Technology
(AT) Training**

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One-year online subscription
\$110 per year; One-year student
online subscription (Electronic
Textbook) \$50.

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United States must be accompa-
nied by a money order or a check
drawn on a U.S. bank and payable
in U.S. funds. Purchase orders are
accepted from schools or institu-
tions in the United States.

PUBLICATION INFORMATION

Closing The Gap (ISSN: 0886-
1935) is published bi-monthly
in February, April, June, August,
October and December.

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contents december, 2013/january, 2014

volume 32 | number 5

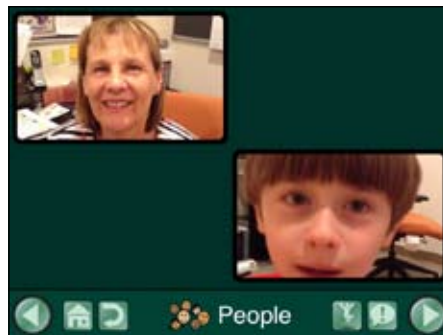
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The New Common Core State Standards Assessments:

Building Awareness for Assistive Technology Specialists

The Common Core State Standards (CCSS) in English Language Arts and Mathematics (<http://www.corestandards.org/>) were released in June 2010 as the outcome of work by the National Governors Association. States were encouraged to adopt the new standards as a prerequisite for applying for educational reform funding known as Race to the Top. To-date, 45 states, the District of Columbia and four territories have adopted the standards (see Figure 1).

The CCSS were designed to replace the individual content standards found in each state. The general notion of educational reform used in the CCSS is that we must increase expectations and engage students in more sophisticated thinking and problem solving in order to produce an educated work force attuned to the needs of 21st century society. Of particular concern to policymakers, business leaders and educational leaders is that, currently, the United States does not fare well on international rankings of academic achievement. One such international comparison is known as the Programme for International Student

Assessment (PISA) (<http://www.oecd.org/pisa/>).

The release of 2012 PISA test results are scheduled for December 3, 2013. In the past, when the PISA test scores were released every two years, the event tended to provoke headlines in the United States about the poor quality of our education system. That is because the U.S. often finds itself in the top third of the rankings (United States: 18th in reading, 25th in mathematics and 23rd in science), rather than in the top three positions (like one might expect in terms of Olympic medals). The international tests suggest that a much smaller percentage of students are performing at the highest levels of achievement than are found on individual state tests. The conflicting evidence is interpreted as meaning that existing state assessments are not as rigorous as the PISA and, therefore, should be replaced with more rigorous measures of learning outcomes.

The adoption of the CCSS also set the stage for the development and implementation of a new high stakes assessment system. Because CCSS effectively changes the curriculum (C), it is expected that significant changes will also occur in instruction (I) and assessment (A). The C-I-A equation must be effectively aligned to produce the type of educational outcomes being sought through educational reform. Over the past few years, teachers and administrators have focused on learning about the new CCSS and determining how teaching and learning must change (the I part of the equation) to produce the higher outcomes found in the standards.



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The purpose of this article is to introduce readers to emerging trends and issues associated with the new generation of high-stakes assessments (the A part of the equation). Of particular interest to assistive technology specialists are factors associated with the accessibility of the new assessments. New developments are occurring on a weekly basis. As a result, the information below summarizes six critical issues that every assistive technology team needs to address during the 2013-14 school year and provides links to stay knowledgeable about the challenges and opportunities students with disabilities will encounter as they participate in the new assessments.

THE BASICS

A key principle of current educational reform efforts in the United States focuses on the use of standardized assessments to measure student learning outcomes. Over the past ten years, federal law has required these assessments be given for reading and math. The requirement, to test at least 95 percent of all students, has been particularly problematic for students with disabilities who struggle to access these paper-based assessments. However, beginning in 2014-2015, high-stakes assessments will be computer-based. This development offers new opportunities but also presents some challenges.

One of the key features of No Child Left Behind (NCLB) was the emphasis on

standardized assessment as a method of accountability for closing achievement gaps. However, this law, known as the Elementary and Secondary Education Act (ESEA) has yet to be reauthorized by Congress. So the Obama administration has been issuing waivers to grant states flexibility in meeting the legal requirements. To learn more about the flexibility guidelines and whether or not your state has been approved for a waiver, visit: US Department of Education Flexibility Waivers (<http://www.ed.gov/esea/flexibility>).

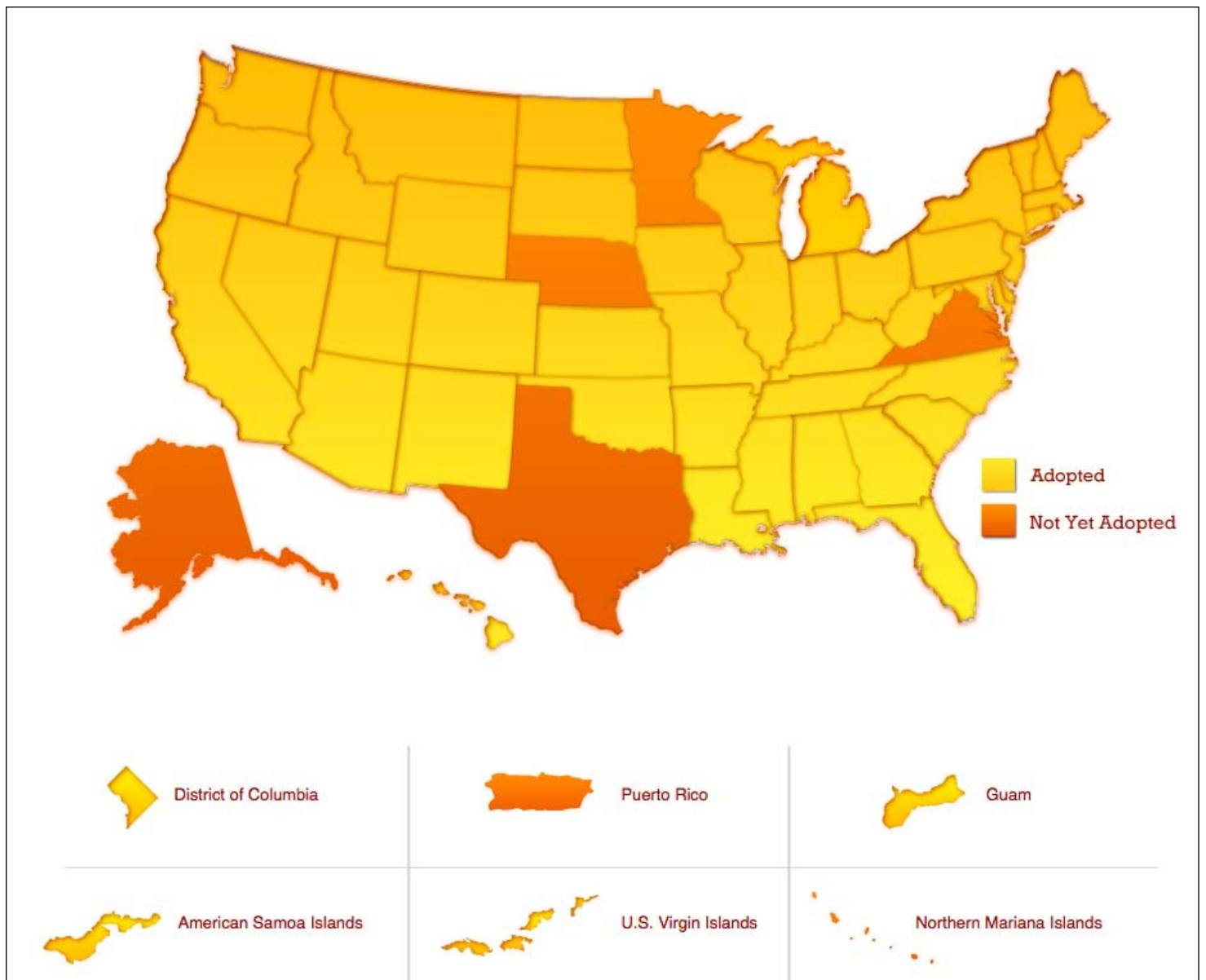


Figure 1: States in yellow on the map above have adopted the new Common Core State Standards (CCSS). Source: <http://www.corestandards.org/in-the-states>

Beginning in the 2014-15 school year, states will need to administer tests to assess student performance on the CCSS in English language arts and mathematics, thereby replacing the state-specific accountability assessments that were required under NCLB.

In anticipation of this transition, in September 2010, the U.S. Department of Education awarded approximately \$400 million dollars of Race to the Top funding to two consortia, PARRC and Smarter Balanced, to develop a new generation of high-stakes tests that would allow states to implement a new accountability system. A month later, two additional awards were made, for approximately \$67 million dollars, to two consortia that would create a new generation of alternate assessments on alternate achievement standards, aligned to the CCSS for students with the most significant cognitive disabilities: The National Center and State Collaborative Partnership (NCSC) and The Dynamic Learning Maps Alternate Assessment System Consortium (DLM).

Whereas each consortia is approaching the test development process in a slightly different way, there is the possibility that students could take up to five tests each year: (1) Diagnostic Assessment (early fall) to diagnose skill deficits and grade level baseline performance, (2-4) Progress Monitoring Assessment (n=3, fall, winter, early spring) to provide formative information on academic growth and ascertain their trend line is on target to meet the end-of-year progress goal, and (5) Summative Assessment (late spring) to be used for accountability purposes. However, this may change as a result of budget limitations that may affect both the development process, as well as how much states and school districts can afford to spend on the new assessments (estimated to be \$22-27 per child per year). Another element of concern centers on the fact that many districts have already incurred considerable expense by adopting progress monitoring formative assessments; however, these assessments are not necessarily aligned with the summative assessment.

CRITICAL ISSUE #1: UNDERSTAND WHICH CONSORTIA YOUR STATE HAS PARTNERED WITH

States implementing the CCSS have been given the opportunity to join one or more consortia to help guide the development of

Consortia	Focus	Website - Learn More
Dynamic Learning Maps (DLM)	The new DLM Alternate Assessment System will let students with the most significant cognitive disabilities show what they know in ways that traditional multiple-choice tests cannot.	http://dynamiclearningmaps.org/
The National Center and State Collaborative Partnership (NCSC)	The National Center and State Collaborative (NCSC) is applying the lessons learned from the past decade of research on alternate assessments based on alternate achievement standards (AA-AAS) to develop a multi-state comprehensive assessment system for students with the most significant cognitive disabilities.	http://www.ncscpartners.org/
Partnership for Assessment of Readiness for Colleges and Careers (PARRC)	The new K-12 assessments will build a pathway to college and career readiness by the end of high school, mark students' progress toward this goal from 3rd grade up, and provide teachers with timely information to inform instruction and provide student support.	http://www.parrconline.org/
Smarter Balanced Assessment Consortium (SBAC)	The Smarter Balanced Assessment Consortium is a state-led consortium working to develop next-generation assessments that accurately measure student progress toward college- and career-readiness. The work of Smarter Balanced is guided by the belief that a high-quality assessment system can provide information and tools for teachers and schools to improve instruction and help students succeed – regardless of disability, language or subgroup.	http://www.smarterbalanced.org/

Table 1 - Four consortia responsible for developing the next generation of high stakes tests for assessing student performance on the CCSS.

the new assessments or to create their own assessment system. As a result, it is critically important that each assistive technology team understand which consortia their state has partnered with in order to begin monitoring the field testing, technology requirements, sample tests, etc. Table 1 provides a summary of the four consortia. Notice that your state may be involved in one consortia for the general CCSS assessment and a different consortia for the alternate assessment (sometimes referred to as the one percent test for students with the most significant cognitive disabilities).

CRITICAL ISSUE #2: UNDERSTAND THE TECHNOLOGY REQUIREMENTS FOR THE NEW COMPUTER-BASED TESTS

One problem with paper-based assessments is the extensive time required for scoring and reporting the results. Because the new generation of assessments will be computer-based, this provides new opportunities for developers to expand the accessibility of the assessments. As a result, it is necessary for each assistive technology team to understand the technology platform requirements for each type of assessment that their students may be required to take. Table 2 provides links to the guidance documents that have been issued by each consortia to assist school districts in making appropriate investments in technology infrastructure.

Unfortunately, to-date, many school districts' assistive technology specialists have not been involved in planning meetings with the district assessment director, special education director and educational technology network manager concerning the implementation of the new assessments. Significant attention must be devoted to ensuring that adequate consideration has been provided for the array of assistive technology devices used by students and that such systems will be compatible with the technology-based assessment platform.

CRITICAL ISSUE #3: UNDERSTAND THE ACCOMMODATION POLICIES FOR THE ASSESSMENTS DEVELOPED BY THE CONSORTIA YOUR STUDENTS ARE INVOLVED WITH AND THE IMPLICATIONS FOR ASSISTIVE TECHNOLOGY USE (OR NON-USE)

The consortia have been challenged to design the new assessments using principles of universal design. While this offers

Consortia	Technology Requirements
Dynamic Learning Maps (DLM)	http://dynamiclearningmaps.org/pdf/DLM%20System%20Technology%20Requirements.pdf
The National Center and State Collaborative Partnership (NCSC)	http://www.k12center.org/rsc/pdf/National_Center_and_State_Collaborative_Summary.pdf
Partnership for Assessment of Readiness for Colleges and Careers (PARRC)	http://www.parconline.org/technology
Smarter Balanced Assessment Consortium (SBAC)	http://www.smarterbalanced.org/smarter-balanced-assessments/technology/

Table 2 - Each consortium has released guidelines for school districts to ensure that the proper technology infrastructure is in place to allow students to take the computer-based assessments.

Consortia	Accommodation Policies
Dynamic Learning Maps (DLM)	
The National Center and State Collaborative Partnership (NCSC)	
Partnership for Assessment of Readiness for Colleges and Careers (PARRC)	http://parconline.org/parcc-accessibility-accommodations-and-fairness
Smarter Balanced Assessment Consortium (SBAC)	http://www.smarterbalanced.org/wordpress/wp-content/uploads/2013/09/SmarterBalanced_Guidelines_091113.pdf

Table 3 - Links to consortia accommodation policies.

significant opportunity for enhanced accessibility, it also means that assistive technologies cannot be overlooked.

The two consortia developing the alternative assessments (DLM and NCSC) are seeking to design their assessment platform so that it can have universal access features, like increased font size or text-to-speech available, in addition to being compatible with assistive technologies. However, as of early October 2013 they have not released accommodation policies to govern the use of assistive technologies.

PARRC and SBAC have released accommodation policy guidelines (see Table 3) that will be subsequently refined during field testing (more about this issue below). It is essential that each assistive technology team become familiar with these policies and the implications for what assistive

technologies will be allowed and what types of tools will not be permitted. An area of particular controversy centers on embedded supports that may provide function similar to assistive technology but are being made available to all students in the context of universal design (i.e., notepad, text-to-speech, highlighting tool). Assistive technology teams must carefully evaluate these guidelines in order to anticipate the unintended consequences for their students and provide feedback to their consortium and state department of education.

CRITICAL ISSUE #4: RE-EXAMING THE IDEA MANDATE TO CONSIDER ASSISTIVE TECHNOLOGY WHEN PLANNING EACH STUDENT'S IEP IN THE CONTEXT OF EACH STUDENT'S PARTICIPATION IN THE NEW COMPUTER-BASED 2014-15 READING AND MATH ASSESSMENTS

In the past, test developers determined what assistive technology was and was not permissible with the test they created. Generally, this perspective defaulted to banning interventions that could potentially alter construct validity (i.e., Should text-to-speech be allowed to be used on a reading test?). This caused considerable confusion relative to IEPs that documented a student's need for assistive technology because of a reading/learning disability.

At the present time, there is still a good deal of uncertainty about how and when assistive technology will be permitted with the new assessments. As a result, it is critically important that each assistive technology team participate in each IEP meeting to determine (a) the need for assistive technology in the new assessments and to (b) properly document these findings on the IEP so that the IEP is current and accurate. Since each state will determine a deadline for qualifying students with disabilities for accommodations for each testing period, it is essential that the IEP reflect the student's assessment accessibility needs. This means that the profession must become grounded in evidence-based decision-making concerning when and how students benefit from assistive technology.

CRITICAL ISSUE #5: VOLUNTEER TO PARTICIPATE IN FIELD TESTING OF THE NEW ASSESSMENTS

Each consortium is engaged in an iterative process of development and field testing. Field tests are underway during Fall 2013 and will be conducted again in Spring 2014. As a result, assistive technology teams should work with their special education director and assessment director to volunteer to serve as a field test site in order to ensure that students with disabilities, who use assistive technology, are invited to participate in the field test (see Table 4).

At the present time, some test accommodations will only be accessible by an adult turning on the features before the student begins the test. For students who use assistive technology, it may be physically impossible for an assistive technology specialist

Consortia	Field Testing Plans
Dynamic Learning Maps (DLM)	http://dynamiclearningmaps.org/moreinfo/external_pilot.html
The National Center and State Collaborative Partnership (NCSC)	http://www.ncscpartners.org/Media/Default/PDFs/NCSC-Policymaker-General-Handout-4-Pages-June-2013.pdf
Partnership for Assessment of Readiness for Colleges and Careers (PARRC)	http://www.parrconline.org/field-test
Smarter Balanced Assessment Consortium (SBAC)	http://www.cde.ca.gov/ta/tg/sa/smarterfieldtest.asp

Table 4 - Links to consortia field testing schedules.

Consortia	Sample Test/Items
Dynamic Learning Maps (DLM)	http://dynamiclearningmaps.org/unc/texts/index.html
The National Center and State Collaborative Partnership (NCSC)	
Partnership for Assessment of Readiness for Colleges and Careers (PARRC)	http://www.parrconline.org/samples/english-language-artsliteracy/grade-10-elaliteracy
Smarter Balanced Assessment Consortium (SBAC)	http://sampleitems.smarterbalanced.org/itempreview/sbac/ELA.htm

Table 5 - Links to consortia sample tests and sample test items.

to activate these features for all students that need them, in all classrooms and in all buildings when the tests are simultaneously administered. This is just one of many implementation issues that has been identified in early field tests. There is much more to be learned about the array of devices, operating systems and assistive technologies that could render a technology-based assessment platform inaccessible. As a result, assistive technology teams must be willing to devote significant time and energy to identifying these problematic issues and advocating for their proper resolution.

CRITICAL ISSUE #6: REVIEW SAMPLE TESTS AND SAMPLE ITEMS WITH TEACHERS AND STUDENTS WHO USE ASSISTIVE TECHNOLOGY TO EVALUATE POTENTIAL ACCESSIBILITY BARRIERS

Most of the consortia have released a few test preparation items to allow students, parents and teachers the opportunity to begin examining the types of questions that

will be found on the assessments, as well as practice tests (see Table 5). As a result, assistive technology teams must become familiar with these practice tests and analyze the content and format for accessibility barriers. At the present time, little is known about the accessibility of the new assessments as development continues.

As noted earlier, assistive technology teams must be willing to devote significant time and energy to identifying problematic issues in the design and delivery of the new computer-based assessments and advocating for their proper resolution. It is essential that the profession share their experience and advocate for improved test accessibility. ■

Easy and Effective Ways to Communicate and Participate With AAC Apps on iDevices

Augmentative alternative communication (AAC) applications (or apps) on iDevices are increasingly being used by individuals who have complex communication needs (CCN) and rely on AAC technology to communicate. There are over 250 AAC apps for iDevices, providing individuals who have CCN with immediate access to voice output technology. New features and apps are being released weekly, creating new challenges for educators, families and therapists to keep up with the “hottest” new tools, while at the same time determining which app will best meet individual needs.

In March 2011, the AAC Rehabilitation Engineering Research Center (RERC) published a white paper titled “Mobile Devices and Communication Apps.” http://aac-rerc.psu.edu/documents/RERC_mobiledevices_whitepaper_final.pdf Consumer issues and service

delivery are just two issues discussed in this paper. In December 2011, David McNaughton, Sam Sennott, Howard Shane and Jessica Gosnell published a research brief on YouTube titled “Mobile Devices and Communication Apps: Current Trends and Future Directions.” <http://www.youtube.com/watch?v=3F3Ud6BFtAQ&feature=c4-overview-vl&list=PL9C7CF7E0B2F19902> In this video, Shane and Gosnell discuss numerous issues, including the importance of customizing AAC apps. Many of the features Shane alludes to in this video (e.g., GPS capabilities) have come or are coming to fruition today.

The sheer number of speech and language and AAC apps create challenges for service delivery and quality control for consumers, their families and professionals. Due to the affordable price of iDevices and the immediacy of

downloading apps, individuals and/or their families often purchase one or many AAC apps. Families and professionals report that apps are intuitive and easy to program. iDevice technology is widely talked about, sought out and desired by individuals, families and professionals.

It’s common for individuals to arrive at a professional evaluation asking for assistance in using their iDevices and apps. Individuals and their families may or may not be struggling to use the AAC apps they have purchased. Prior to the iDevice craze, these individuals communicated primarily using speech generating devices (SGDs), which were most often obtained after a comprehensive AAC assessment.

Individuals with CCN have many AAC technology options to select from now. Those who have SGDs may or may not be abandoning them. Individuals may or may not be trying out and/or using



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different AAC apps. Individuals may or may not have AAC apps that are optimal for them.

Now, more than ever, we **MUST** be teaching language, we **MUST** be supporting participation, we **MUST** be teaming, we **MUST** be using built-in features in iDevices and AAC apps and teaching individuals and their families how to use them. And we **MUST** be critical thinkers in evaluating and implementing AAC apps and resources.

The Participation Model by Beukelman and Mirenda (1988) identified that the purpose of an AAC assessment and intervention is to facilitate meaningful communication and participation in daily life activities. Essentially, the model includes ongoing assessment and intervention for participation. This is an appropriate model for creating successful communication opportunities for individuals with CCN today. Throughout this article, you'll find ways for your students to participate in activities with their apps.

As stated above, there are over 250 AAC applications available for purchase and immediate download. All AAC apps are low cost compared to SGDs. Examples of free AAC apps include: Answers: YesNo Free by SimplifiedTouch; and NeoPaul, NeoKate and NeoJulie by NeoSpeech, Inc. Answers: YesNo Free allows individuals to program two buttons with text and/or pictures and to record speech. NeoPaul, NeoKate and NeoJulie are text-to-speech apps.

For years we've been trying to move students beyond yes/no communication; however, this cool and completely customizable app, Answers: YesNo Free, allows students to practice this skill while actively participating in a lesson. For example, in a school rainforest unit, one team can be the gorillas and the other the lions. You simply incorporate a photo of each and add sound in the app. The student with CCN can "roar" when their team scores a point and likewise for an individual or two on the "gorillas" team. Older students can participate by using their iDevice to type out a comment while another student talks about the lesson. NeoPaul and NeoKate or NeoJulie allow male and female students with CCN to speak the text in an appropriate voice when their turn arises.

Additionally, a range of low-cost AAC apps by TapSpeak, LLC, are offered, like TapSpeak Button and TapSpeak Sequence Standard, at less than \$30 each. Students can successfully participate in the Writers' Workshop or simply use vocabulary in the app to retell a story or present a project.

AAC apps are being developed by different sources, such as family members of individuals with CCN e.g., MyTalkTools, new AAC app developers e.g., Avaz by Invention Labs, and Predictable by Therapy Box, and existing AAC manufacturers e.g., GoTalk NOW by Attainment Company, and TouchChat by SilverKite. We've included examples for only a few of the many tools/companies in our field due to space limitations. Please keep in mind that often you can use the tools at your fingertips to carry out similar goals and objectives.

AAC apps must be customized for individuals. We still need to understand the student's language development and current language level. Technology allows us to have access to language and to assess language more quickly. Decisions are more difficult because many apps are not based on research and vocabulary studies, hence, the need for critical thinking when choosing an app to meet an individual's complex communication needs. The following three resources provide assistance in assessing an iDevice:

- <http://www.aactechconnect.com/AAC>
- <https://itunes.apple.com/us/app/aac-evaluation-genie/id541418407?mt=8>
- http://www.childrenshospital.org/~/media/Centers%20and%20Services/Programs/A_E/Audiology/PDFofFeatureChart.ashx

Individuals who have CCN have many choices. When apps have been appropriately and optimally matched to an individual's current and anticipated language and participation needs, immediate positive results have been reported by families, school teams and therapists. Several case studies with implementation of AAC apps are included here.

At 4 years, 10 months, Gavin was a preschooler with a recent medical diag-

nosis of Provisional Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) when the GoTalk NOW app was introduced to him by his preschool team. At the time, he was essentially nonverbal. He was not willing/able to imitate, he pushed persons away who asked yes/no questions and he didn't engage with others. He was most successful when signs and gestures, rather than spoken words, were used to help him follow routines.

Today, Gavin, at 5 years, 8 months, is using symbols and corresponding vocabulary on multiple pages in the GoTalk NOW app on his iPad to request items and to participate in academic tasks. His preschool team reported that he has recently begun answering yes/no questions and that he is saying "yes" verbally. He is beginning to imitate the voice output in the app. For example, at snack time, he will request, "I want crackers," using GoTalk NOW, and then verbally say "crackers." Gavin also speaks descriptive words, again imitating the voice output in the GoTalk NOW app after activating message buttons and hearing the voice output from the app. His school team is hearing more spontaneous speech this school year. This is significant progress for a young communicator in less than a year!

Nolan is preschooler diagnosed with autism spectrum disorder (ASD) at 2 years of age. At 5 years, 2 months, he had no functional communication when seen by a speech-language pathologist for an AAC evaluation. At this initial consultation, Nolan showed good potential to use symbols and voice output. He has a wonderfully supportive family, eager to implement recommendations.

Pictures of highly preferred people (e.g., grandma) and activities were immediately introduced to him on customized pages in the GoTalk NOW app (see images 1 and 2).

Simultaneously, multi-modal AAC systems were introduced and used with him. These included light tech communication displays, aided language input presented to him on sentence strips during therapy sessions and the AAC application on his iPad.

All of Nolan's communication and communication attempts were reinforced.

He was highly attentive to and motivated by the GoTalk NOW app on his iPad. It should be noted that his iPad is used only with the AAC app. His family has another iPad they use with him to play games.

Over the past five months, Nolan's language abilities and use of pictures and symbols on pages in the GoTalk NOW app have expanded from 4-message button pages to 25-message button pages containing between 15 and 20 symbols and corresponding vocabulary. Nolan is encouraged to use vocabulary in his app at home, at school and during therapy. His participation in activities, as well as his expressive language and vocabulary, are clearly increasing now that he has access to appropriate language on his AAC app. Nolan has started interacting with a peer during therapy sessions (see images 3 and 4).

The above young learners and others with CCN will continue to need AAC apps programmed with appropriate vocabulary words and language content.

iDevices with AAC apps can help students meet common core curriculum standards in classroom settings. The following Web resources can guide you to the knowledge and skills students should develop in K-12 education:

- <http://www.corestandards.org/>
- <http://dynamiclearningmaps.org/#sthash.XKVOEtVp.dpuf>
- <http://www.ncscpartners.org/>

In Kindergarten, programming may be as simple as putting classmates' names in a student's iDevice to get peer attention. Or, for example, a first grade regular education teacher asked for "1 more" and "1 less" to be added to a student's communication page to allow this individual with CCN to participate in math activities for the next month. We need to adjust participation based on common core standards per grade level and content areas (see image 5).

Since iDevices have emerged as AAC tools, we're seeing unexpected use and positive outcomes with teens and young adults who traditionally have not had access to and/or used SGDs. Some persons with autism spectrum disorder have gone through school with access



Image 1 - Initial display.



Image 2 - Initial displays of favorite choices.

to assistive technology tools. They were provided with visual schedules and/or aided language input, yet have had limited or no access to voice output communication devices for expressive communication. If they had spoken language, it was extremely limited, often

scripted, and clearly not functional to meet their daily communication needs.

Upon receiving iDevices and exploring different AAC applications on them, many teens and young adults have literacy and/or language generation abilities their families, teachers and therapists didn't

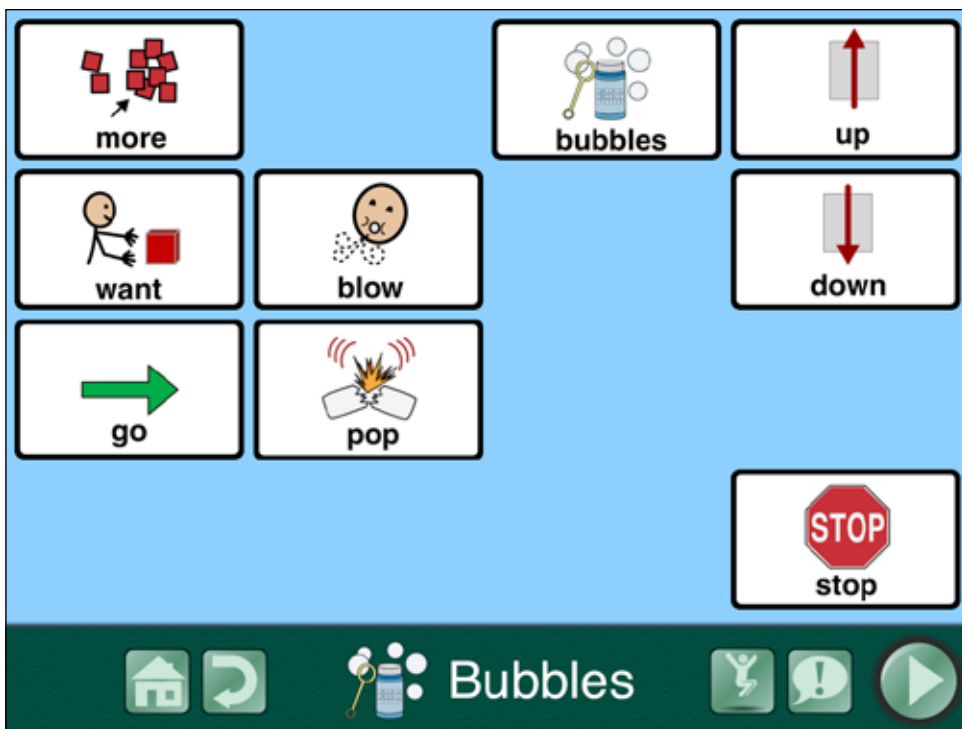


Image 3 - Vocabulary expansion and progression.

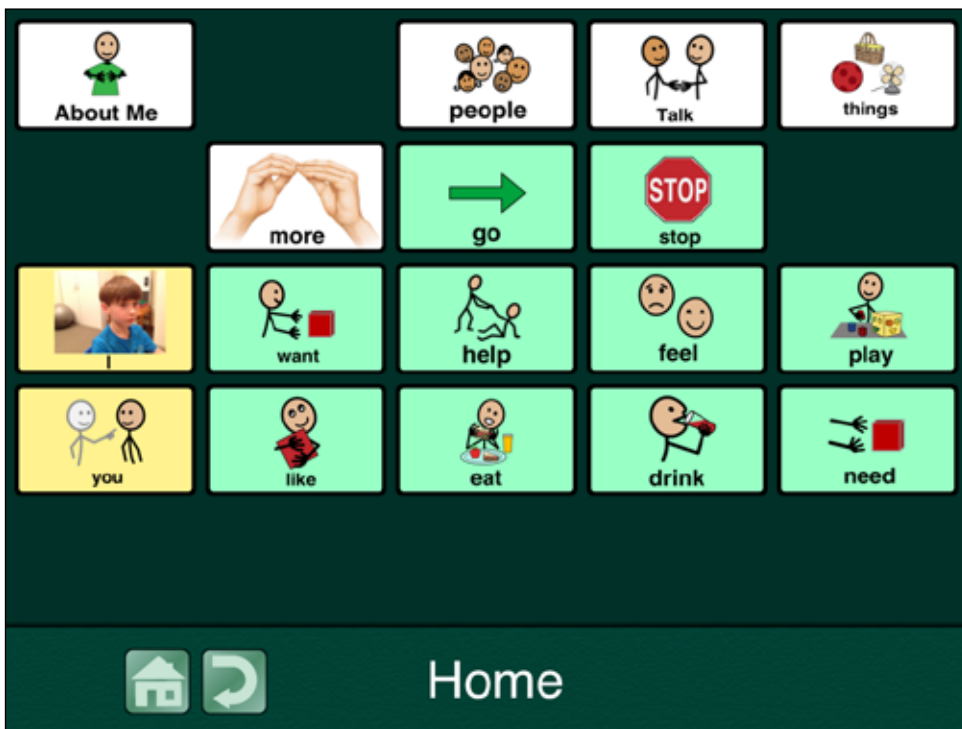


Image 4 - Current home page.

know they possessed. Spencer and Kelly are two teens who use NeoPaul and NeoKate respectively to augment their communication and successfully communicate in small groups, indepen-

dently typing out words, phrases and sentences.

As wonderful as iDevices are, individuals who use AAC and need alternative access (e.g., scanning) have not been able to use many AAC apps, and options

for those who need access to rich vocabularies are limited. GoTalk NOW is one app that provides auditory cues and a “pan” feature that allows auditory cues to be provided privately with a splitter, ear buds and external speaker that requires mounting.

Apple’s mobile operating system, iOS, releases more and more accessibility features with each iOS update. Information on built-in accessibility can be found at <http://www.apple.com/accessibility/ios/>. With iOS 7, there are now built-in options for scanning. Jane Farrall, speech-language pathologist and special educator, recently provided a thorough and impressive overview of switch use on her blog: <http://www.janefarrall.com/blog/tag/accessibility-2/>.

Individuals we work with, their families, school teams and therapists should be taught to use the built-in features of iDevices. Using iDevices, they can quickly pull up images, content and videos related to academic work. Other uses include taking pictures and videos, emailing, taking notes and creating lists. Using iDevices in classrooms is a wonderful way for students who have complex communication needs to be active participants in their learning communities.

Some AAC apps interface with social networking and social media. TouchChat and Predictable are examples of two apps that have built-in features allowing text generated in the AAC app to be shared directly to Facebook, email and Twitter, and copied and pasted into other apps (see image 6).

Young adults with developmental disabilities are using AAC apps to advocate for themselves and perform jobs in the community. For example, a young man who had previously activated a single-message AAC device for most of his life to participate in school or work activities, now owns and operates his own business with a business support team led by his mother. The iPad with the GoTalk NOW app allows his team to take video clips that Adam can access in a single button display. He can play one video at a time to relay information about his business before automatically going on to the next page, where he can repeat

the action to play another video segment or single message. He can engage a listener looking at his iPad to watch the video and then interact with Adam to learn more. Adam's iPad with the AAC app provides him with more opportunities to participate in his work and community life. Check-out <http://canscount.org/profiles/mypage.asp?pid=59> or <http://www.youtube.com/watch?v=9ixXDyvmYI&feature=youtu.be> to learn more about his business adventure.

Use of AAC apps on iDevices immediately breaks down barriers and is more widely accepted by both familiar and unfamiliar communication partners. The ease of use and programming capabilities adds to the comfort level and competency of both the individuals using the AAC apps and those supporting them.

With support in the community, a young person can achieve greater independence with features offered in some AAC apps. Going miniature golfing or participating in most any activity, like others his age, was always a goal for one young man. Now with the increased interest of others and the technology, his goal has become a reality. Check out <http://youtu.be/fa03xbjY6xs> to see him with his iDevice creating successful interactions with partners across ages and settings.

While this is an unsettling and ever-changing time in the field of AAC, it's also an incredibly exciting time. We must remember and continue our quest to provide successful interactive AAC services, regardless of the tools we choose to use. To achieve communicative competence (as defined by Janice Light) we adhere to basic language development and provide opportunities for all to communicate and participate in their day-to-day lives.

Now, more than ever, professionals must adhere to best practices when supporting individuals with CCN in their use of AAC technologies to communicate. We must support, educate and work closely with families, school teams, transition teams, other therapists and individuals in the community to assist individuals who want to communicate and actively participate to the best of their abilities. Participate now and communicate with your school or work teams successfully via iDevices. ■

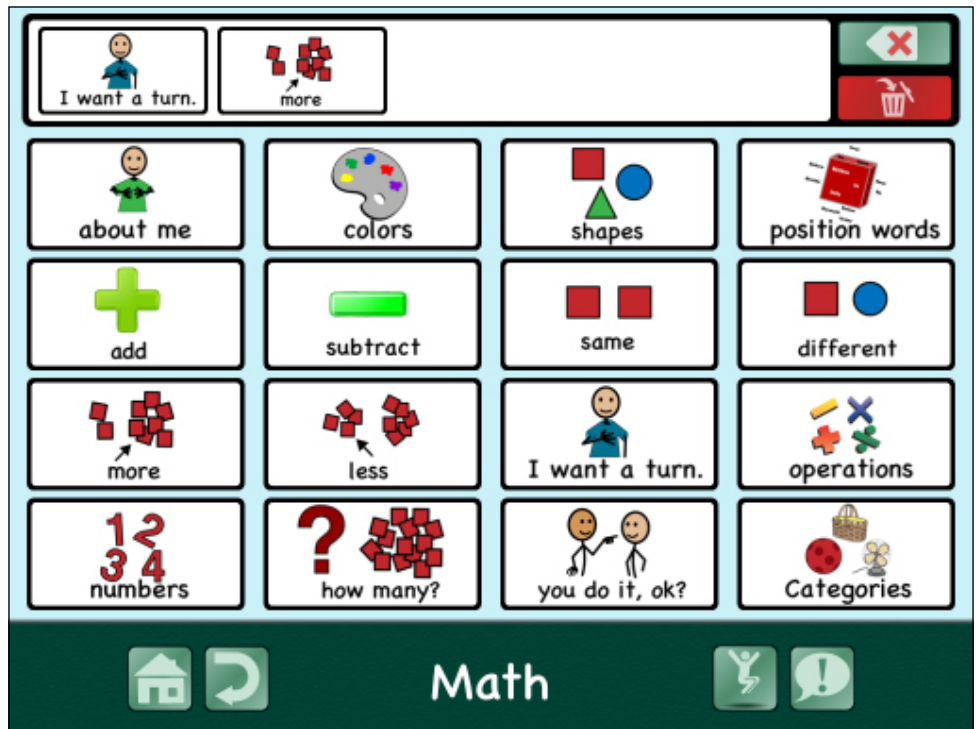


Image 5 - Grade level content.

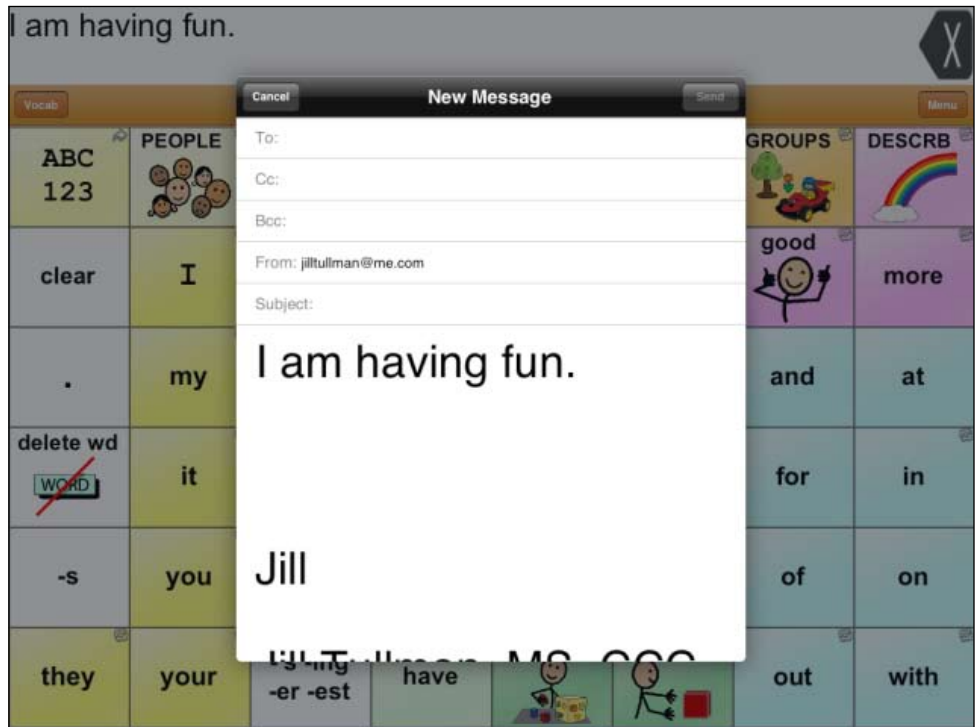


Image 6 - Social media example.

DISKoveries

Technology Tricks

By Joan Tanenhaus

Did you know that you can interface your interactive entertainment system (Wii, Xbox) and connect it to your whiteboard?

This will allow you to use the whiteboard screen to project the Wii or Xbox programs and to run them

in the classroom. There are many Wii and Xbox programs that offer our students new and different educational and social-interactive experiences. These can include fun practice of early learning skills, activities for physical exercise and other goals in physical therapy, eye-hand coordination, participation in sports that wouldn't otherwise be possible because of motor limitations, turn-taking skills and much more.



JOAN TANENHAUS, M.A., CCC, Speech-Language Pathologist/Assistive Technology Specialist, is Founder and Executive Director of Technology for Language and Learning, Inc., a non-profit organization dedicated to advancing the use of computers and technology with children and adults with Special Needs. (email: ForTLL@aol.com)

In order to interface these devices, you need to locate the input connectors on the whiteboard. They may be AV or VGA connectors or HDMI connectors. Once you locate these and identify the type of cables you can connect, you can then go to your Xbox or Wii and identify which cable you have and, instead of connecting to a television, you can just connect to your whiteboard. The Xbox 360 can connect with either an HDMI cable or a component AV cable. A VGA cable may not come with the Xbox 360 console so you will need to purchase it separately. If you already have the cable but your display does not have a VGA port, you can purchase an adapter. For additional help, see the Xbox Support Forums at <http://support.xbox.com/en-US/browse/xbox-360?xr=shellnav>. The Wii can connect using AV cables. Locate the set of yellow, red and white holes identified as “input.” (The yellow is video input, white is audio input left or mono, and red is audio input right.) Then select the correct input on the whiteboard input select options. For help with Wii, you can visit Nintendo Wii support at http://www.nintendo.com/consumer/systems/wii/en_na/ht_system.jsp?menu=console&submenu=rvt-ht-sys-hookup-tv-overview.

Here are reviews of some new programs, followed by a list of old favorites (previously reviewed Wii and Xbox programs) that offer excellent educational and learning opportunities.

EA Sports (www.easports.com) has an excellent new selection of sports games for all fans. These are great programs to use for social-interactive experiences, turn-taking and team-play. They also set the stage for communicating about many things – understanding the differences between opinions and facts, importance of planning ahead, strategies for planning and many other valuable executive function skills. Most of all, these programs allow individuals with special needs to participate in sports that they would never be able to play because of physical and other limitations. Some of the new EA Sports games available for Xbox 360 and PlayStation include:

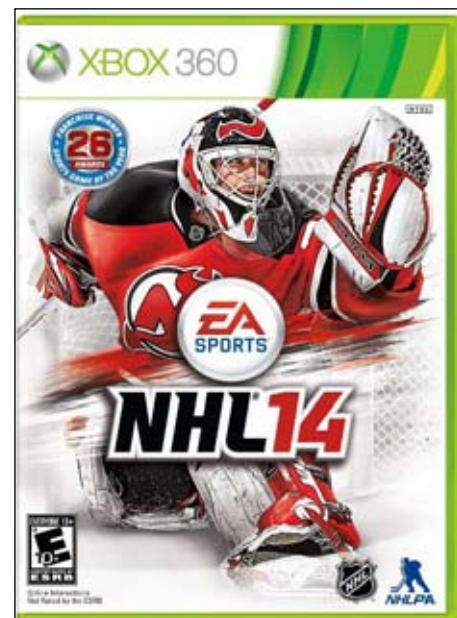
Fifa 14: This 2014 version of the classic soccer game offers many new features. Players now have the ability to adjust their stride and approach angle to find the best position for hitting the back of the net. A new “Protect the Ball” feature enable players to fend off and block opponents from the ball while running at any speed. You can craft your ultimate dream team with 40 legendary players.

Madden NFL 25: For die-hard football fans, this classic gaming program offers many new features in the new version. For the NFL ball-carrier (running back, quarter back or safety) there are new power moves, such as “hit stick,” “truck,” “dive tackle” and more, to add control over the outcome of your play. You can be a player, a coach or an owner. You can manage personnel, set prices and build a stadium in the all-new Owner Mode.

NHL 2014: Let’s not forget the hockey fans. In this new edition of NHL, there are many new features. The “Be a Pro” Career mode lets you make important choices that affect your career – your relationships with fans, teammates and management and your skills and progression in the field. The new NHL Collision Physics introduces truer-to-life collisions! A new left-stick control makes delivering a hit simpler than ever.

Some previously reviewed Wii and Xbox programs:

- **Wii Music** (Nintendo: <http://www.nintendo.com>)
- **Wheel of Fortune for Wii** (THQ: <http://www.thq.com>)
- **Are You Smarter Than A 5th Grader?**
- **Back To School for Wii** (THQ: <http://www.thq.com>)
- **Big Beach Sports 2 for Wii** (THQ: <http://www.thq.com>)
- **New Carnival Games for Wii** (2K Play: <http://www.2kgames.com>)
- **Birthday Party Bash for Wii** (2K Play: <http://www.2kgames.com>)
- **Dora’s Big Birthday Adventure for Wii** (2KPlay: <http://www.2kgames.com>)
- **Nickolodeon FIT for Wii** (2KPlay: <http://www.2kgames.com>)
- **Nickolodeon FIT for Wii** (2KPlay: <http://www.2kgames.com>)
- **Jeopardy for Wii** (THQ: www.thq.com)
- **Kinect National Geographic for Xbox 360** (Microsoft: <http://www.microsoft.com>)
- **Kinect Sesame Street TV for Xbox 360** (Microsoft: <http://www.microsoft.com>)
- **Just Dance 3 for Kinect Xbox 360** (Ubisoft: <http://www.ubisoft.com>) ■



How Much is Your Time Worth?

Turning an Adapted Computer User INTO A POWER USER



That is the question that assistive technology specialists Jonathan Campbell and Rachel Magario from PACER's Simon Technology Center, asked their audience at the 2013 Closing the Gap Conference. Stop and think for a moment about the repetitive tasks you perform on your computer, day after day, such as writing an email, sorting your inbox, opening and closing software or even typing your own email address. What would you do if these daily tasks took significantly longer for you to perform than your coworkers and friends? You'd find a better and faster solution.

With that challenge in mind, Rachel and I presented Turning an Adapted Computer User into a Power User at Closing the Gap 2013, where we demonstrated real world examples of how automation and macro tools can be used to save hours of time with only a little bit of work upfront. Automation and macros can turn tasks that take minutes into tasks that take seconds and remove the tedium of repeating those same steps over and over again.

THE INSPIRATION

About a year ago I was feeling overwhelmed by the amount of work coming across my desk. I decided to audit the time I spent on daily tasks and noticed that many of my common tasks were repetitive. I write technology information letters for the assistive technology consultations we conduct that all have the same introduction, I send the same confirmation email several times a month, I open and close the same five folders several times a day, I spend a lot of time filling out timecards but work the same hours most days, and many more. I decided that if I didn't want to remove things from my workload, I was going to have to make these daily tasks more efficient. So I

reached into the back of my desk and dusted off my old ShuttlePRO 2, a 15-button programmable switch interface for video editors, opened my favorite automation software, Keyboard Maestro, and turned each of those steps into a single button press.

Then I started thinking about how useful these kinds of solutions would be for an adapted computer user whose daily tasks are already slowed down by their access method.



JONATHAN CAMPBELL Jonathan Campbell is an Assistive Technology Specialist for PACER's Simon Technology Center. He has experience working as a computer trainer at Apple and working hands-on as a paraprofessional in the classroom assisting children with disabilities. He has a passion for technology that he uses to present, promote and inform about the benefits of assistive technology through workshops, trainings and in-services. He is the developer of the Visual Currency Calculator app for the iPhone and blogger for LoveltToBits.com. Jonathan is also the producer of the Assistive Technology in Action video series that highlights assistive technology users and the Simply Said video series that explains complex concepts in easy-to-understand language. All his video projects are freely available on the PACER Center YouTube page. He can be reached at [<jonathan.campbell@pacer.org>](mailto:jonathan.campbell@pacer.org).

WHO ARE ADAPTED COMPUTER USERS?

An adapted computer user is someone who uses an alternative means of accessing his or her computer. This could be because a disability makes using a typical keyboard or mouse impossible or very difficult.

Rachel Magario, a PACER coworker, uses a screen reader to access her computer. By using VoiceOver, she can do anything on her computer using her keyboard, as long as the software is accessible. But using a screen reader can slow down various tasks and require a lot of keyboard button presses to complete some common tasks.

Jared Green, who owns his own graphic arts company Nerd Webhosting and Advertising (<http://nerdwebhost.biz>), uses a sip and puff switch to control an on-screen mouse and keyboard software program called SwitchXS that he uses by scanning and choosing actions from an on-screen menu. Jared is an accomplished computer user who knows his way around professional software like Photoshop. You can see how Jared's setup works in our AT in Action video series that highlights assistive technology users. His video can be found at: www.pacer.org/stc/videos/.

Rachel, Jared and myself decided to team up and explore what automation could do for an adapted computer user.

WHAT IS AUTOMATION

Automation is when you give your computer a set of instructions to follow that completes a common task, thereby saving you time and effort. For example, you can create an automation that opens your email software, starts a new message, addresses it to your coworker and adds the subject line, "Weekly update." These tasks can be triggered automatically when an action takes place or through the press of a button, a keystroke or by even typing a string of text. Sometimes these types of automations are referred to as macros.

We decided to break up automation into three categories: Text Expansion, Beginner Macros, and Advanced Macros.

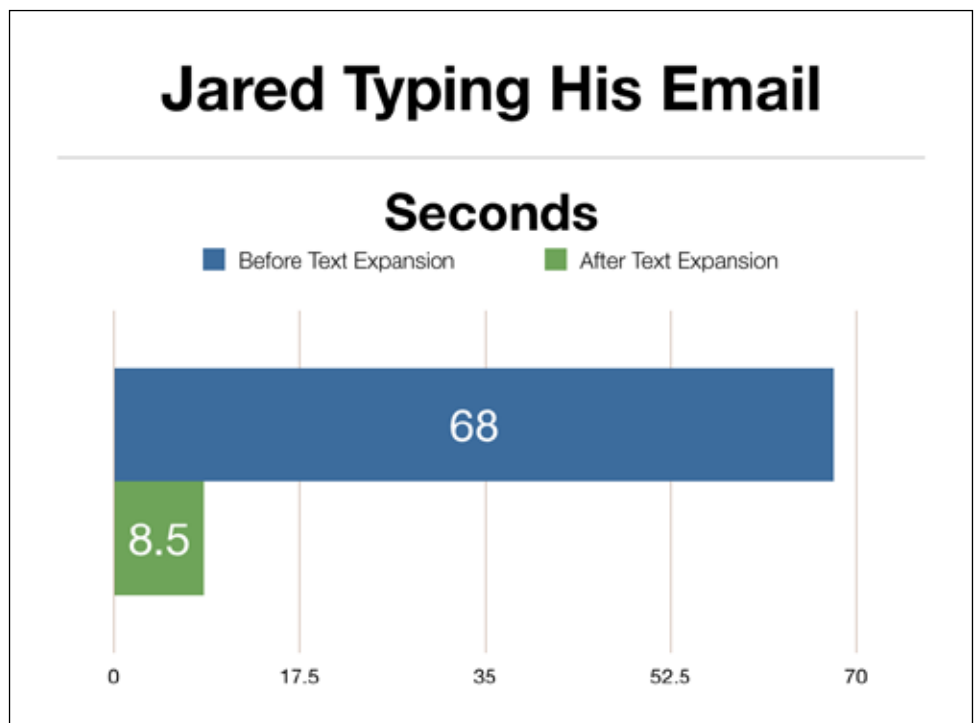
TEXT EXPANSION

Text expansion is the simplest and easiest automation tool to set up and use. It allows you to shorten the amount of key presses it takes to write out phrases or paragraphs that you write often. For example, instead of having to write out "between," you could write "bt" and your computer will expand it to "between" for you, or instead of writing out "Nice to meet you," you could type "ntmy." All you need to do to make text expansion work for you is to identify common phrases or long words you use often. You can even

use text expansion to write out letter or email introductions or signatures. Many text expansion programs will also support using a shortcut like "dt" to type out today's date.

Jared Green is a business owner and often corresponds with new business clients on the Web. Often times he needs to share his contact information with these new contacts. Using his sip and puff switch and the SwitchXS software, it takes him about 68 seconds to write out his entire business email address. Now that he uses text expansion, it only takes him 8.5 seconds. At an absolute minimum, Jared writes his business email out once a day. If you were to add up the time Jared saves using text expansion then, at the end of a year he has saved a minimum of six hours. But this isn't about time saving alone, what about the amount of physical effort it takes to write out that email? It took Jared 60 individual button presses to write out his email with his sip and puff, but after creating his own text expansion shortcut, he can now do it in only three button presses. Adding up the button presses he has saved himself, you get 20,805 less times he needs to use his sip and puff switch every year!

Like myself, Rachel regularly writes informative letters to families who have attended an assistive technology consul-



tation at PACER's Simon Technology Center Library: www.pacer.org/stc/. Most of these letters include the same basic introduction, but rather than writing it all out every time, she uses text expansion to speed up the process. When she types the shortcut "consultintro," she is prompted for the date of the consult, name of the person and the visitor's address. The computer then writes the entire introduction for her in an instant!

Tools

There are a lot of text expansion software programs available, and most of them come with a free trial, so don't be afraid to try one out.

TextExpander | Mac, iOS | \$35

www.smilesoftware.com/TextExpander

TextExpander is Rachel's tool of choice. It is easy to use and makes creating simple or even complex expansions a snap. It comes with some great advanced tools for creating expansions with fillable information, like the one she uses for consultation letters. It even has an iOS app for expansion on your iPad or iPhone, however, it has more limitations than the desktop version.

Typinator | Mac | \$35

www.ergonis.com/products/typinator/

Typinator is another easy-to-use text expansion program for the Mac. It can do simple and advanced expansions with fillable information. This was the first text expansion program I ever used, and if it wasn't for TextExpander's iOS companion app, I would still be using it today.

Texter | PC | Free

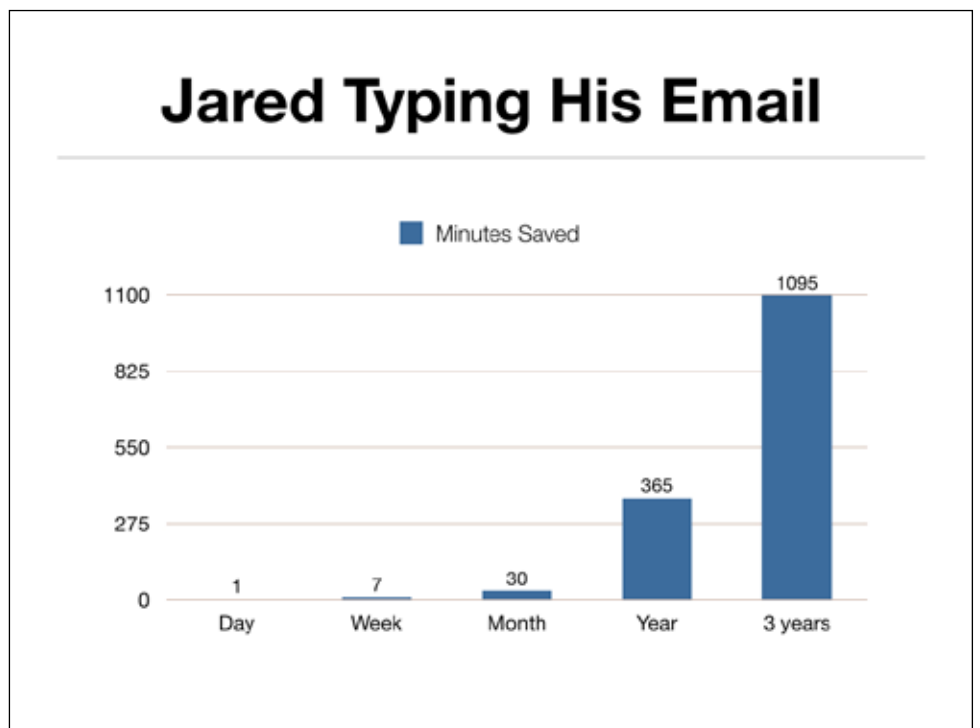
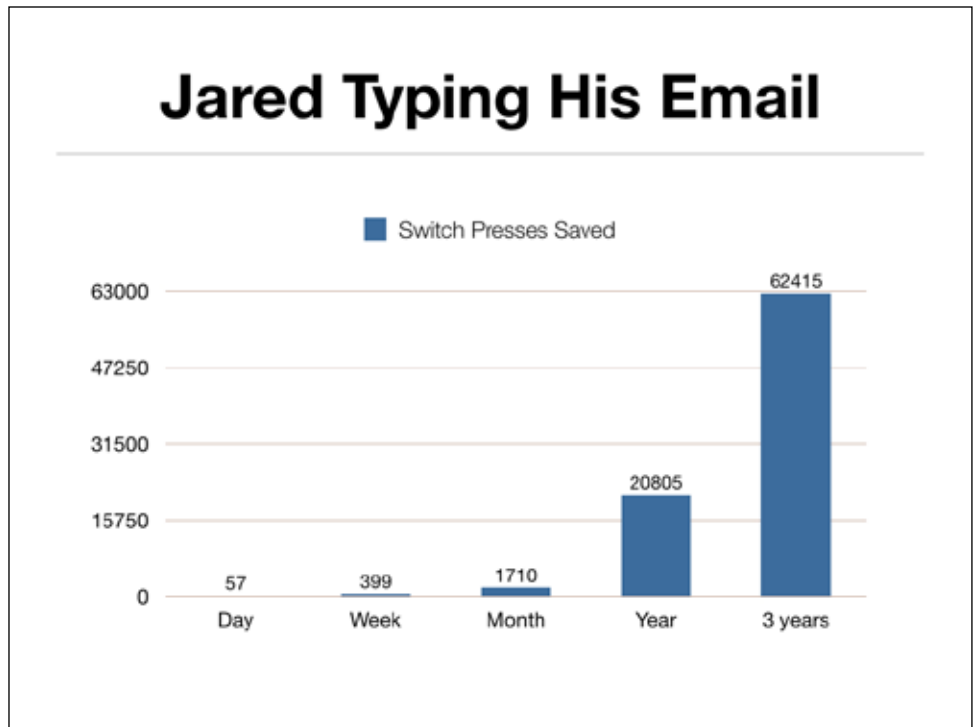
lifehacker.com/238306/lifehacker-code-texter-windows

Texter is an open source text expansion program for Windows. It can perform both simple and advanced expansions, but is not nearly as user-friendly as the other options. Advanced form filling functions can be accomplished, but you have to learn Texter's "hot strings" scripting language first.

PhraseExpress | PC | \$50

www.phraseexpress.com

PhraseExpress is a robust text expander for Windows. It has a very similar feature set to TextExpander, and you can even share expansion settings between the



two. PhraseExpress makes creating text expansions quick and easy and supports complex and advanced expansions if needed.

MACROS

Macros allow you to automate a specific series of tasks on your computer. With a macro, you can have the computer press a key combination for you, open a program, perform a task in the menu bar

or even convert a file from one type to another.

Rachel performs thousands of key presses every day to navigate around her computer. Some of the tasks she does often, like sorting email in her inbox, can take several key combinations and key presses. Sorting a single email can take up to 16 seconds in some cases. Rachel and I got together and created a macro

that automates most of the keystrokes she would have to press in order to sort a message into a folder, now taking around 4.5 seconds, which is as fast, if not faster, than most sighted users.

Jared created his own macro that opens and closes commonly used software on his computer. This saves him a significant amount of time, as he no longer has to control the mouse with his sip and puff switch in order to click on the program in the dock that he wants to open, a process that can be time consuming and laborious. Jared took it an additional step further and modified his SwitchXS layout, turning a complicated set of button presses into only three button presses.

Tools- Low Cost Beginner Tools

Automator | Mac | Free
support.apple.com/kb/HT2488

Automator comes on every Mac and makes creating Macros very simple. With Automator, you create Workflows, which are a series of steps the computer will take when you run the macro. All of the actions that Automator can do are listed and you drag and drop them into the work area in the order you would like them to take place. Actions, like Text to Audio File, will take any text file or the text you highlight and create an audio file of the computer reading it out loud in a digital voice. Automator can create workflows that function as stand-alone programs, services (options you get when you right-click), folder actions and more.

Action(s) | PC, Mac | Free
app.jbbres.com/actions/

Action(s) is similar to Automator but has fewer actions to choose from. Just like Automator, you have a menu of actions the computer can take and you create workflows that will follow each action you choose, in order. Workflows are then saved and run like programs. Action(s) has a great selection of actions for writing emails, manipulating files, grabbing content off the Internet and more.

MouseController | PC | Free
sourceforge.net/projects/mousecontroller/

MouseController doesn't create macros in the strictest sense, but rather allows you to record mouse clicks and movements you commonly perform and play them back with shortcut keys. These are really easy to set up, but macros that use the mouse are the easiest to break because if little things happen, like a window gets moved slightly, the macro will not function as intended, so keep that in mind.

Advanced Macro Tools

Keyboard Maestro | Mac | \$36
www.keyboardmaestro.com

Keyboard Maestro is Rachel's personal choice for automation. The big advantage of Keyboard Maestro is its very large collection of actions and the variety of ways you can trigger those actions. You can set macros to launch on a keystroke, a timer, when the computer wakes up, when a device, such a printer, is plugged in, or even when you press a button on a USB game controller. Rachel uses a PlayStation controller to trigger some of her macros. Creating a macro is a matter of choosing your trigger, then picking out your actions from a list. I used Keyboard Maestro to customize the buttons on my ShuttlePro.

AppleScript | Mac | Free
- developer.apple.com/applescript/
- www.macosexautomation.com/applescript/

AppleScript is an easy-to-learn scripting language that comes built into every Mac. Scripting is very powerful because it allows you to send commands directly to your computer's software, rather than simulating keystrokes and mouse movements. This tends to make these macro's more reliable, but much more difficult to create than using a visual tool, like Automator. To make an AppleScript macro, you need to learn to write with a very basic scripting language. Use the links above to find out more. From time to time, we have used AppleScript to perform an action not included in Automator.

Macro Recorder | PC | \$50
www.jitbit.com/macro-recorder/

Macro Recorder is like a much more powerful version of Action(s), and it comes with a large collection of actions.

You use the tools on the right to generate actions, customize the order and you can even press the record button, which allows Macro Recorder to record your mouse and key presses.

AutoHotKey | PC | Free
www.autohotkey.com

AutoHotKey, like AppleScript, is a simple scripting language that offers very powerful and reliable automation, but at a steeper learning curve. You will have to learn AutoHotKey's scripting language, which can be found on their website. Once you learn a few simple lines of code, you will be able to write complex macros.

CONCLUSION

Rachel, Jared and myself have only scratched the surface of what automation can do to make our work faster and more efficient. Every time we are faced with a repetitive task, we stop for a moment to consider if automation could make that task faster. The best advice we can give is to take it one step at a time. Don't try to add dozens of automations all at once, just add a new one every few days. We got overzealous once and lost track of all the shortcuts we made. Download one of the tools, create an automation, use it a couple of times, then try to create another one.

Remember that it isn't always about saving time. Jared can tell you himself, using a single button press vs a dozen is just more satisfying. After all, didn't we build all these computers so they could do the boring work for us?

ShuttlePRO 2
By Contour Design, Inc.
10 Industrial Drive
Windham, NH 03087
1-800-462-6678
Mac & PC
\$109.95
<http://retail.contourdesign.com>

Keyboard Maestro
By Stairways Software Pty Ltd
ID#10679
PO Box 16
Nobby Beach QLD 4218
Australia
support@stairways.com Mac
\$36.00
www.keyboardmaestro.com

VoiceOver

By Apple, Inc.
1 Infinite Loop
Cupertino, CA 95014
1-877-204-3930 for accessibility phone support
Mac & iOS
Pre-Installed
www.apple.com/accessibility/osx/voiceover/
www.apple.com/accessibility/ios/voiceover/

SwitchXS

By AssistiveWare
Laurierstraat 183
1016 PL Amsterdam
the Netherlands
info@assistiveware.com
Mac
\$299.00
www.assistiveware.com

TextExpander

By SmileOnMyMac, LLC
PMB 278
350 Bay Street, Suite 100
San Francisco, CA 94133
info@smilessoftware.com
Mac, iOS
\$35
www.smilessoftware.com/TextExpander

Typinator

By Ergonis Software
Softwarepark 37
4232 Hagenberg, Austria
office@ergonis.com
Mac
\$35
www.ergonis.com/products/typinator/

Texter

By Adam Pash
PC
Free
lifelifehacker.com/238306/lifehacker-code-texter-windows

PhraseExpress

By Bartels Media
Fleischstraße 17
54290 Trier - Germany
pex@phraseexpress.com
PC
\$50
www.phraseexpress.com

Automator

By Apple, Inc.
1 Infinite Loop
Cupertino, CA 95014
Mac
Pre-Installed
support.apple.com/kb/HT2488

Action(s)

By app.jbbres.com
PC & Mac
Free
app.jbbres.com/actions/

MouseController By Thomas Gutzler

PC
Free
sourceforge.net/projects/mousecontroller/

AppleScript

By Apple, Inc.
1 Infinite Loop
Cupertino, CA 95014
Mac
Free
developer.apple.com/applescript/
www.macosxautomation.com/apple-script/

Macro Recorder

By JitBit
10685-B Hazelhurst Dr. # 5214
Humble, TX 77043 (646) 397-7708
support@jitbit.com
PC
\$50
www.jitbit.com/macro-recorder/

AutoHotKey

By Chris Mallet
PC
Free
www.autohotkey.com ■

“I Love this Computer!”

Considerations for Using Assistive Technology to Engage Middle School Students with Disabilities in Authentic Writing

As students with disabilities transition to middle school, there are increased expectations for writing, especially with the adoption of the Common Core Curriculum Standards.

Students with significant disabilities require more time and specialized instruction than typical peers to develop and master basic literacy and writing skills. Teachers are sometimes at a loss for how to continue this instruction and need new methods and tools to support learners in reaching the standards and achieving IEP goals in writing.

Assistive technology tools, (e.g. SOLO6 www.donjohnston.com; Classroom Suite www.intellitools.com; adaptive keyboards, online authoring websites, and laptop and classroom computers), used in combination with authentic writing activities, can bridge the gap between emerging skills and meeting increased writing demands in middle school. This article presents case studies of four unique learners, with a range of characteristics and disabilities, including autism, intellectual developmental disabilities and significant learning disabilities, who struggled with writing and highlights a literacy instructional framework that included authentic writing as a lesson component. Each case study describes how assistive technology tools, combined with powerful teaching, helped scaffold students' skills and allowed them to experience success in writing.

CONSIDERATION 1: USING INSTRUCTIONAL FRAMEWORKS FOR WRITING

One of the most helpful frameworks to consider when teaching writing is writer's workshop, an instructional framework

developed by Lucy Calkins and colleagues from The Reading and Writing Project (2013) of Columbia Teachers College (<http://readingandwritingproject.com>) Within the writer's workshop structure, a daily block of the classroom schedule is dedicated strictly to writing, teaching students the stages of writing, including the **planning, drafting** and **editing** of pieces for publication. Teachers teach mini lessons to a whole group of students (e.g. choosing a topic, using both pictures and words in writing), then provide more individualized support to students, allowing for differentiated instruction well suited to a class of diverse learners, including those with IEPs. In addition to Calkins, Sturm (2012) also supports the use of a writer's workshop format, with adaptations and the use of technology to teach students with developmental disabilities to become authors. Calkins (2013) recently developed units of study in writing that match the Common Core Curriculum Standards requirements for informational, persuasive/opinion and narrative writing. The case studies presented here include mainly narrative writing and describe how assistive technology tools, combined with



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specific teaching strategies, can assist students at all stages of writing.

According to Merriam-Webster (2013), *authentic* means: “Real, accurate, true, meaningful.” Authentic writing fits well within the narrative writing component of the new Common Core Curriculum Stan-

dards. When reluctant writers are given opportunities to write authentic pieces, such as personal narratives (e.g. “All About Me”), non-fiction pieces about a hobby or topic of interest to them, or write about a powerful personal experience, like a recent vacation, it can be extremely motivating. Teachers can use authentic

writing as a “bridge” to get students excited about writing, then transition them to write about other topics (science, social studies, responding to a book or text exemplar from the Common Core Curriculum), using the assistive technology tools described here.

CONSIDERATION 2: KNOWING STUDENTS, SETTING CURRICULUM GOALS AND SCAFFOLDING FOR SUCCESS

Most readers are familiar with the SETT Framework (Zaballa, 2005) that considers the student, the environment, the task (or curriculum goal) and the specific technology tools that can assist the student in reaching their goal. For writing instruction to be effective, teachers must know their students’ strengths, interests and learning characteristics well and must set specific goals or objectives (e.g. Logan will write two to three sentences on a topic of his choice) before choosing assistive technology tools. Once the curriculum task/goal is identified, it is crucial that teachers support and scaffold student learning throughout the writing process and in learning to use technology tools. An important stage in the writing process for students is the planning stage, where ideas are generated and organized. Some tools that are helpful at this step include: graphic organizers (see Figures 1 & 4); photos or images to inspire and motivate writers; sentence starters, such as “My favorite character in the book was ____.” or “At home, I like to ____.”; and guiding questions or prompts, such as “Tell us about yourself,” or “If you could make the world a better place, what would you do?” Figure 1 shows a graphic organizer that was used to generate ideas on a story about a student’s vacation to Florida. Digital photos were also used in the planning process for this writer. Throughout the four case studies, powerful teaching and scaffolding strategies accompany the use of technology tools.

CONSIDERATION 3: CHOOSING THE RIGHT ASSISTIVE TECHNOLOGY TOOLS

Knowing students well and determining curriculum goals will help guide teachers in selecting the most effective assistive technology tools. One student may have fine motor challenges and benefit from an adapted keyboard, while another prefers a laptop. Not all students are ready to type on an iPad and need to develop their skills on a more accessible keyboard first. While word prediction and text-to-speech software have been used extensively with students with learning disabilities, students with more significant disabilities were denied access to these programs due to the misperception that they lacked the cognitive skills to utilize these tools. We now know that these students, like other learners, can benefit and develop their writing skills, if they are provided with effective teaching and proper assistive technology tools.

CONTEXT OF CASE STUDIES

Case study participants included four middle school students, three of whom used alternative and augmentative communication devices and had intellectual developmental disabilities, autism or significant learning disabilities. The students in the case studies were taught within a lesson framework that included self-selected or familiar reading, daily guided (or shared) reading instruction, letter and word work and writing for authentic purposes. Teachers used both traditional and digital texts (Fountas & Pinnell Leveled Literacy Intervention (2013) texts, digital books from www.tarheelreader.org, and www.raz-kids.org), frequently assessed students’ literacy skills and levels, chose books at students’ instructional levels on topics that interested them, and taught using the appropriate prompts, reinforcements and scaffolding to further develop their skills. Teachers had various assistive technology tools (SOLO6 ; Classroom Suite; Big Keys Keyboard, iPads and classroom and laptop computers with internet access) at their disposal to use in sessions. This article will focus primarily on the authentic writing component of these lessons.

CASE STUDIES

“Mandy’s Dance Book”: Authoring a book on www.Tarheelreader.org

Mandy was a sixth grader, reading at F&P Level G. She had a strong interest in dance and was a member of several community dance troupes. She had Down syndrome and autism and was largely non-verbal, except when engaged in reading, which was another preferred activity. She had recently read several trade books on dance and had brought in a trophy she’d won in a competition. Mandy had been introduced to www.tarheelreader.org, a large, freely accessible digital library of books created by teachers and students, and enjoyed using the www.tarheelreader.org books during familiar reading time. The books are embedded with reading supports, such as text-to-speech, ability to change font size and background colors, as well as switch-scanning capabilities. The site also serves as a powerful authoring tool. www.tarheelreader.org uses Flickr pictures as writing prompts, or authors can upload their own photos to use. During a single literacy lesson, with Flickr pictures of dancers, teacher’s modeling and specific prompts (“You chose a picture of dancers. What type of dancers are these? These are _____.”), Mandy was taught how to author her own book entitled “Mandy’s Dance Book,” which she published on the website (See Figure 5). She enjoyed reading and sharing her digital book with peers and family members. She subsequently went on to author another book on the Charles Shultz characters from “Peanuts.”

“Thank you!”: Logan with Big Keys, Laptop and Co-Writer

Logan was a sixth grader with autism, reading at Fountas & Pinnell Level C in an inclusive classroom. Logan had great background knowledge and many age-appropriate interests (super heroes, video games, YouTube, animals). Logan enjoyed his literacy sessions, reading books at his instructional level, improving his phonics skills and increasing his vocabulary. When previously presented with writing tasks involving paper and pencil, Logan frequently demonstrated



Dancers win trophies. I won a trophy.

Page of Mandy’s Dance Book from [www tarheelreader.org](http://www.tarheelreader.org)

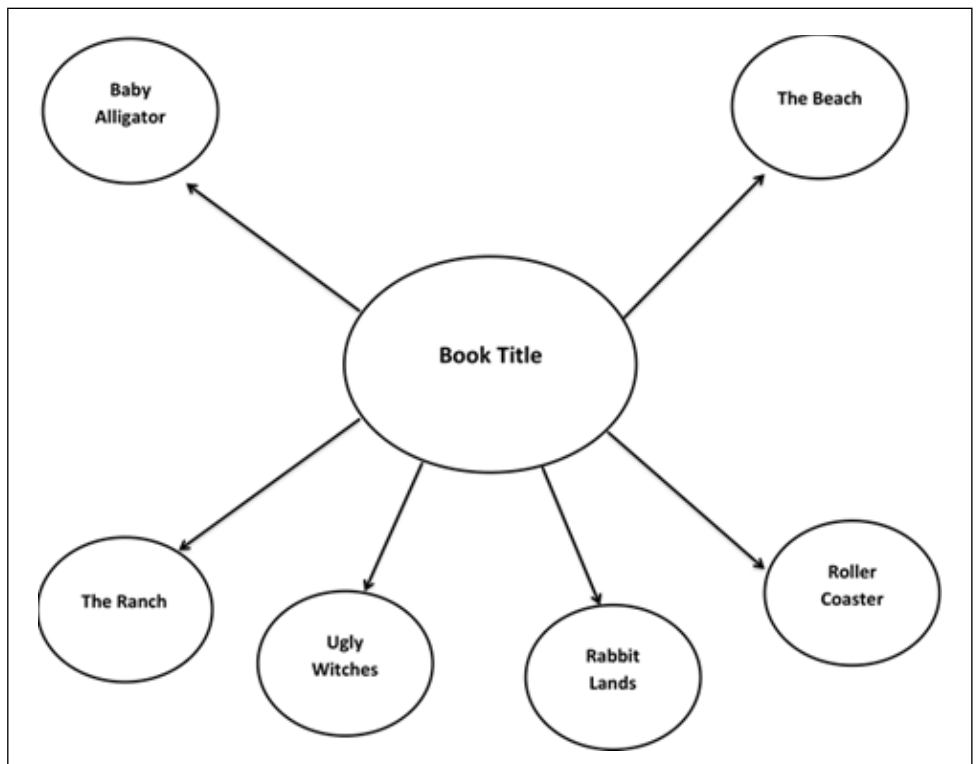


Figure 1 Graphic Organizer for “The Vacation”

challenging behaviors, such as yelling and destroying materials. In one 30-minute session, Logan was taught how to use the Big Keys Keyboard (www.rjcooper.com, www.ablenetinc.com) together with Co-Writer word prediction software www.donjohnston.com installed on a laptop computer to complete an authentic writing assignment about himself and his favorite activities at home. The Big Keys Keyboard features a USB that plugs into any computer or laptop and is instantly usable within a word document. No installation is required. Raised keys help students with motor challenges, and a key divider encourages the use of both hands.

Given teacher modeling of the genre, “My Name is Miss R. At home, I like to read.”, clear descriptions, “This is word prediction. It’s going to tell you what you’re writing.”, and use of prompts, “Do you see the word you want here? Keep looking. Click on it.”, Logan quickly developed the skills to meet an IEP goal in written expression: Logan will write two to three sentences on a topic of his choice, provided teacher prompts and computer technology. Logan’s teacher assisted him in the planning phase of his writing by modeling the genre for him and helping him brainstorm orally the things he enjoyed doing at home. The software assisted Logan in the drafting and editing phase of writing with word prediction, spelling support and a text-to-speech feature. During the writing assignment, Logan’s focus improved and challenging behaviors decreased. Logan expressed gratitude and delight in being able to compose an authentic text using his new assistive technology tools. He repeatedly and sincerely told his teacher “Thank you!!” after having been taught how to use the technology. Figure 2 shows Logan’s finished writing piece.

My Name is Logan

**At home, I play on the computer.
My favorite website is YouTube.
Kingdom Hearts Two is a video game
I play on the Playstation 2.**

Figure 2 Logan’s First Writing Piece



Figure 3 Big Keys Adapted Keyboard

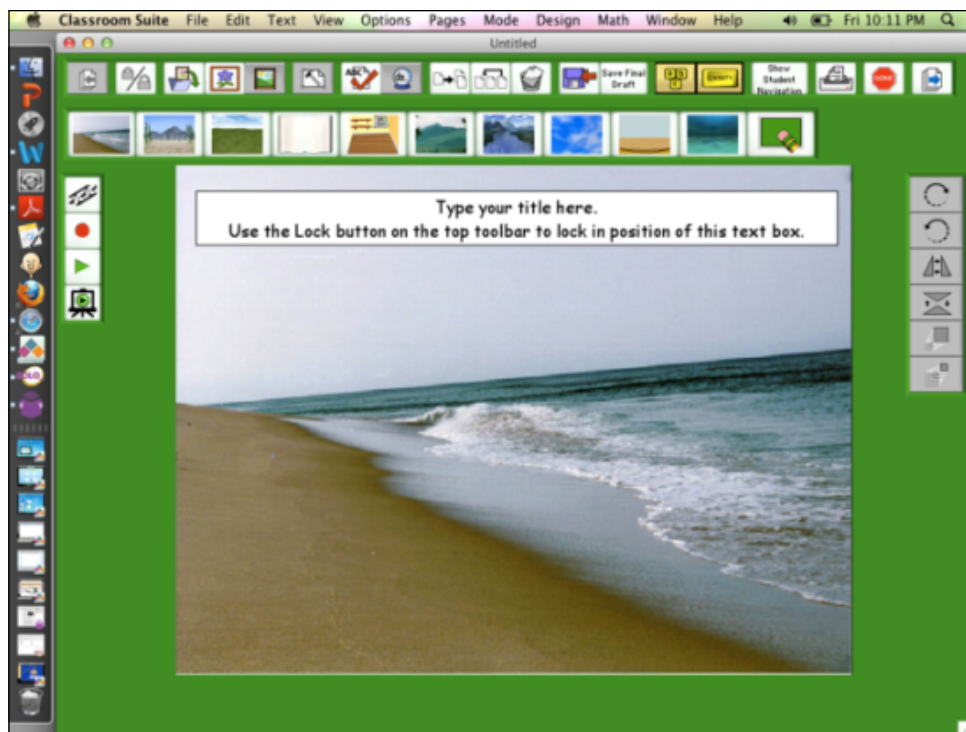


Figure 3 Classroom Suite Writing Template



Figure 4 Final page of “The Vacation” Journal

“The Vacation”: David with Big Keys, Laptop and Classroom Suite (www.intellitools.com)

David was a fifth grader with autism in an inclusive classroom. David read at a Level J (Fountas & Pinnell, 2013) and was on grade level in math. David’s interests included animals, space travel and stories, like Henry and Mudge. David had challenges with communication and motor planning, and his writing tasks consisted mainly of tracing or copying. He had recently gone on a family trip to Florida and his mother had sent in digital pictures of his vacation, one of which was David holding a baby alligator. During literacy lessons, David had been reading nonfiction titles on crocodiles and alligators.

His teacher began the writing assignment in the planning phase, using a traditional graphic organizer with topics and photos from his family vacation in Florida. (See Figure 1). David was then introduced to the Big Keys Keyboard, connected to a laptop computer, with Classroom Suite software (www.intellitools.com) installed. Classroom Suite has writing templates, word prediction, spell check and text-to-speech supports built into the program, which is helpful to students in the planning, drafting and editing stages of writing. Within the journal writing template (See Figure 2), using his digital photos, David was able to create his own journal entitled “The Vacation” (See Figure 4) and was able to meet an objective in writing: Using a graphic organizer, photos from home and computer technology, David will create a digital journal on his trip to Florida.

In conjunction with assistive technology tools, David’s teacher used powerful teaching (planning tools, visuals, specific prompts, guiding questions, and sentence starters “What did the alligator feel like when you held it? The alligator felt ____.”) to scaffold David’s learning. The combination of effective teaching methods and access to the adaptive keyboard and writing software allowed David the opportunity to begin expressing himself freely and more independently than ever before.

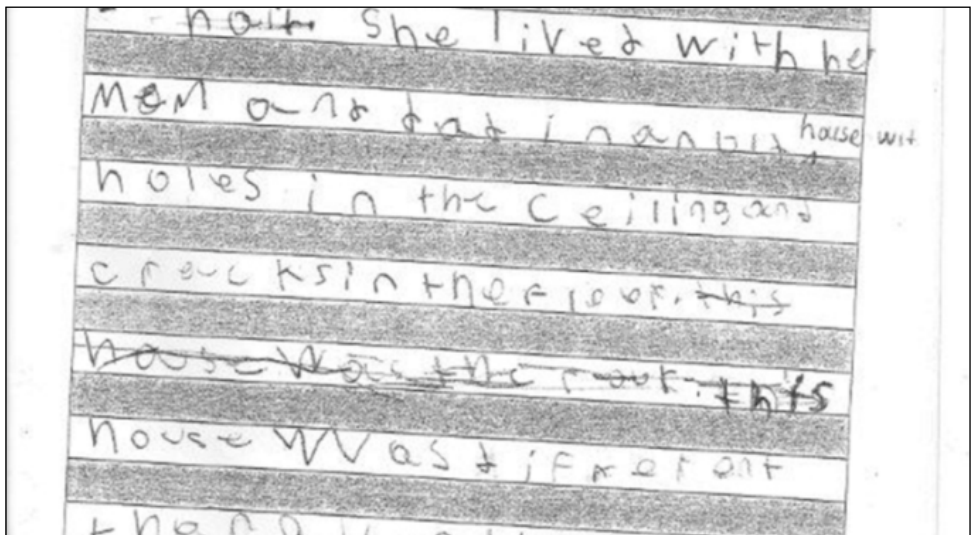


Figure 6 Ali’s Writing Before Using SOLO6

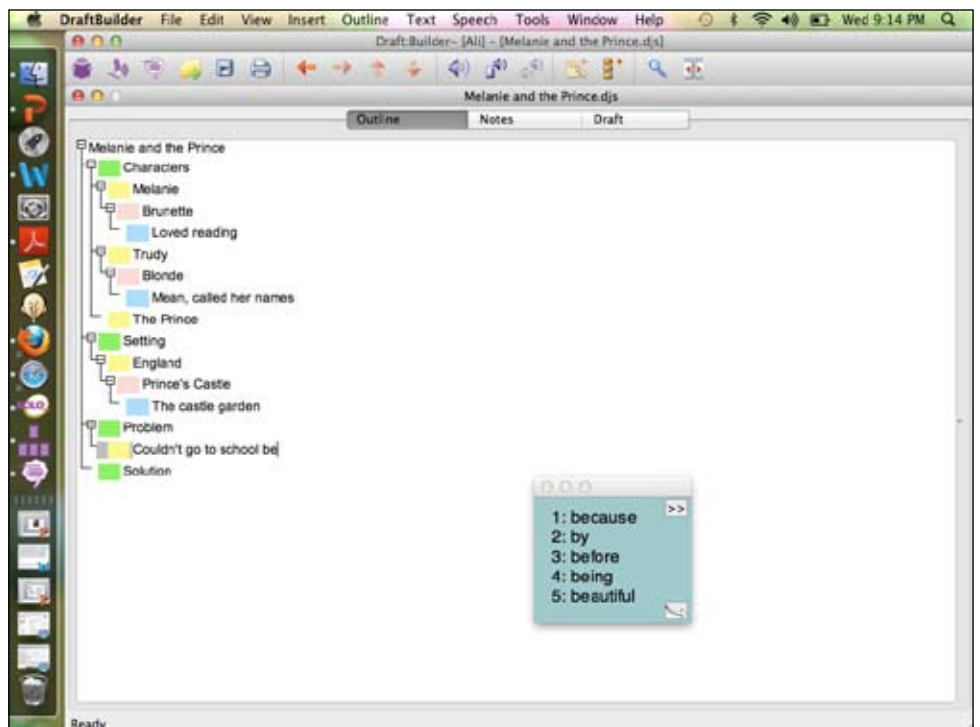


Figure 7 Screen shot of Draft builder outline view and Co-Writer word prediction

“I Love This Computer!”: Ali Writing with SOLO6 on a Laptop Computer

Ali, a fifth grader with significant learning disabilities, was very imaginative and loved fairy tales. She read at a second grade level and would often resist and become frustrated with traditional paper and pencil writing tasks. Ali’s class had been studying folk and fairy tales and students were assigned a writing task to create their own fairy tale. Nor-

mally, this would have been a daunting task for Ali. Her rough draft of “Melanie and the Prince” before being introduced to SOLO6 (www.donjohnston.com) appears in Figure 6 and demonstrates her challenges with handwriting.

After Ali’s initial idea for her fairy tale, her teacher helped her with the planning stage of writing by creating a simple story template (characters, setting, problem, solution), talked through and scribed some of the story elements with her. She then introduced Ali to SOLO6,

specifically, DraftBuilder and Co-Writer software, installed on a laptop computer. Although Ali had generated many ideas for her story, they weren't organized well. Ali was taught to use Draft Builder, with built-in outline and graphic organizer to assist students in planning, organizing and recording ideas for a story or other writing piece (See Figure 7). She was able to "wake up" Co-Writer and use this in conjunction with Draft Builder. Teacher prompts, such as: "Here is a list of words. Do you see the word you need? Just click on it.", gave Ali the scaffolding and confidence to continue on in the writing assignment. She was then able to convert her outline into a draft document and finish her story using Co-Writer. (See Figure 8, a partial sample of Ali's finished piece, "Melanie and the Prince"). Co-writer provided word prediction and spelling support, crucial in the drafting phase of writing. The text-to-speech feature was helpful in the editing phase of writing. Ali appeared delighted with her new writing process, technology tools and finished fairy tale, and remarked several times, "I love this computer!" Given subsequent writing assignments, the laptop with SOLO6 software became her writing tool of choice.

CONCLUSION

All students deserve the chance to develop writing skills, which are critical tools for learning, communicating with others and self-expression. When teachers carefully consider student strengths, interests and learning characteristics; identify relevant curricular goals; select "just right" technology tools and provide powerful teaching, students are inspired to write and can amaze us with their authoring talents!

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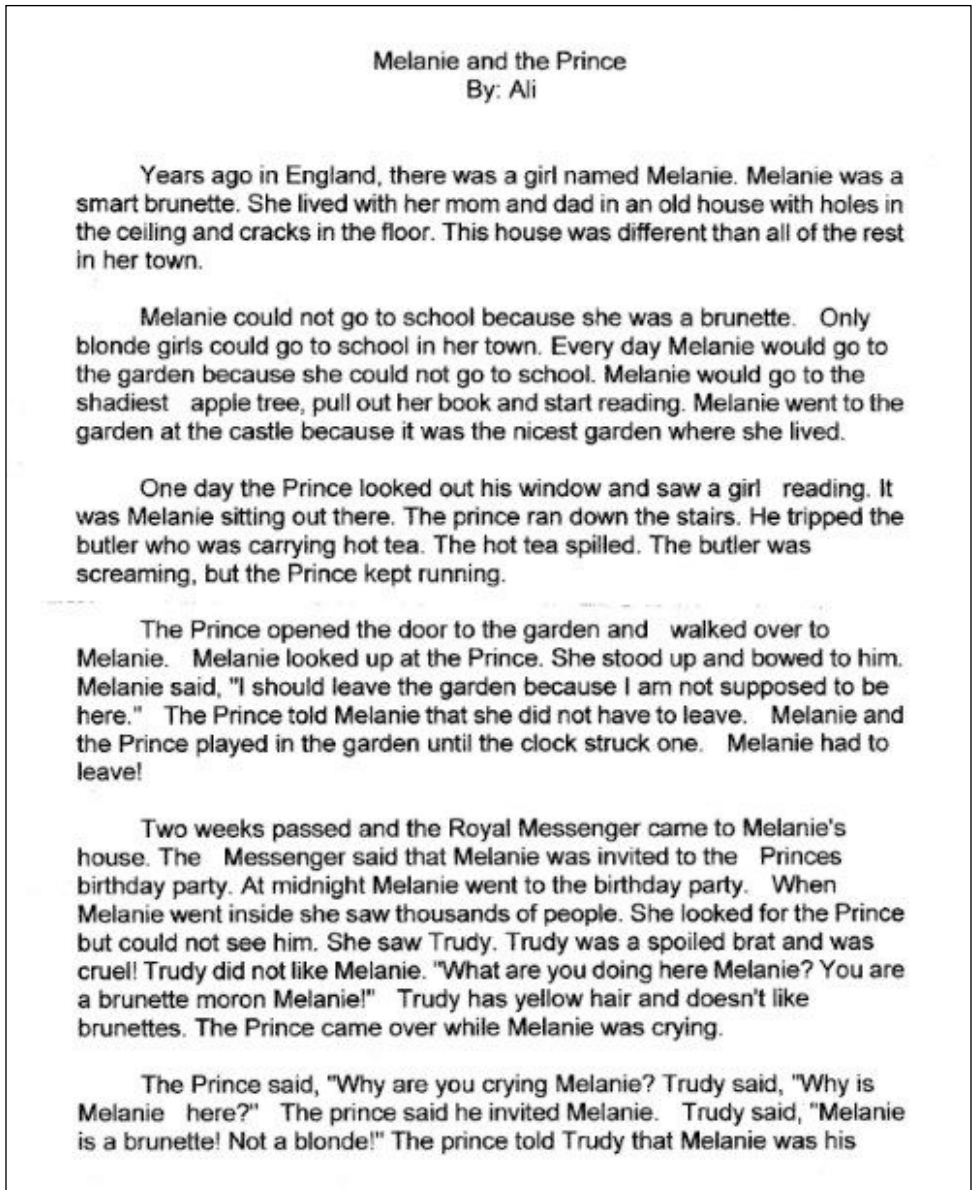


Figure 8: Partial sample of finished piece, Melanie and the Prince, after introduction to SOLO6

mann Publishers.

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ASSISTIVE TECHNOLOGY RESOURCES AND PRICING

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A Model for Successful Assistive Technology (AT) Training

A Client's Perspective on the 25th Anniversary of the Easter Seals Massachusetts AT Program

Easter Seals is well known for its history of selling colorful stamps, but most people do not associate Easter Seals with assistive technology (AT) training. Actually, Easter Seals has AT programs in many states throughout the country. For example, this year marks the 25th anniversary of the AT Program managed by Easter Seals Massachusetts. This innovative program has provided life-altering AT training to many individuals living with disabilities in Massachusetts. As a former client of Easter Seals Massachusetts, I have first-hand insight into the monumental benefits that come from receiving services from this exemplary program.

Many articles about assistive technology focus on specific AT devices, but it's also important to highlight AT programs that provide invaluable training services to people with disabilities. The Easter Seals Massachusetts AT Program is a notable example of such a program. In this article, I will explain how the comprehensive teaching style of this program has had a profound and lasting positive impact on my life. I will also discuss some of the reasons why this particular program is so successful.

I'm a 47-year-old man with many of the limitations of a quadriplegic, as well as a visual disability. The Easter Seals Massachusetts AT Program has provided me with computer services that have enabled me to operate a computer profi-

ciently. My Easter Seals AT specialist, Eric Oddleifson, has given me extensive computer training, ranging from basic tasks, such as how to use Dragon NaturallySpeaking software to dictate in Microsoft Word, to specific disability-related tasks, such as how to obtain a book in digital format on Bookshare.org and use screen reading software to read it out loud. The latter training helped me to resume my college education after a 25-year medical leave of absence.

Eric has a positive approach to computer training that incorporates the use of workarounds and has completely reshaped my opinion of computer technology. The previous three companies that gave me training frequently told me, "You can't do that because you're disabled." Eric, on the other hand, has always said: "Let's create a workaround so that you can do that." I had never even heard of the term "workaround" until he introduced me to it. He has created so many successful workarounds for me that I now look upon any computer technology problem as a challenge that I can overcome, rather than an insurmountable obstacle.

Assistive technology has played an essential role in my successful training. Eric has installed an assortment of AT hardware and software to meet my disability needs. For example, since I am physically unable to restart my computer, he installed a SmartNav Head Tracking

Mouse by NaturalPoint (\$499, <http://www.naturalpoint.com/smarnav/store/catalog.html>) so that I have a hands-free method of restarting my computer whenever the Dragon NaturallySpeaking voice recognition software freezes.

Much of the training that I have received from Eric has focused on Dragon NaturallySpeaking Professional Edition by Nuance (\$599.99, <http://www.nuance.com/for-business/by-product/dragon/dragon-for-the-pc/dragon-professional/index.htm>), which is a vital assistive technology device for someone with mobility issues like me. I completely rely on this versatile voice recognition software to operate my computer. Eric has taught me how to fully utilize Dragon's wide range of features, such as standard voice commands for typing, Internet navigation, and mouse movement. He has also created numerous custom voice commands for my specific disability needs and has showed me how to create custom voice commands by myself.

This Dragon training has immensely expanded my computer capabilities so that I can now operate a computer almost as well as any other person. Having such a high computer proficiency has afforded me numerous opportunities to undertake productive endeavors, including a variety of employment opportunities. For instance, I have worked for my family's restaurant designing menus and flyers

PETER GEFTEAS, age 47, is a long-time user of assistive technology and is an Individual Consumer Consultant for the Massachusetts Rehabilitation Commission. He is also the Outreach Coordinator for the Massachusetts Assistive Technology School Share (ATSS) Program.

and I created its website. I have also worked as a successful seller on both eBay and Amazon and have sold many items.

Since utilizing the features of AT devices is often complex, Eric created many screenshot videos demonstrating how to perform specific AT-related tasks. This collection of tutorial videos serves as a valuable reference tool for those occasions when I forget how to do something. For example, some of Dragon's key features (such as creating a new backup voice file) only need to be performed periodically - so sometimes I have to refer to Eric's videos to refresh my memory. This library of videos is one of the ways in which my Easter Seals training continues to have a lasting positive impact on my life.

One of the most prominent examples of the lasting positive impact that the training has had on my life centers on my vocational aspirations. The astonishing level of independence that I have derived from my Easter Seals training has instilled in me a vibrant enthusiasm for assistive technology, which, in turn, has given me a specific vocational direction. I noticed that Eric dramatically improved my life by sharing his assistive technology knowledge and I wanted to do the same for other people living with disabilities. That's why I have dedicated my life to promoting assistive technology awareness. I have pursued this objective in a variety of ways, such as writing magazine articles about assistive technology. I have worked on AT projects as an Individual Consumer Consultant for the Massachusetts Rehabilitation Commission. For the past several years, I have served as a member of the Massachusetts Assistive Technology Advisory Council. I also created a YouTube channel for the state's AT Program and currently work as the Outreach Coordinator for the Massachusetts Assistive Technology School Share Program.

My success story mirrors a plethora of stories about other Easter Seals Massachusetts clients. Like me, these clients have benefited from an AT Program staff member who has displayed an impressive knowledge of assistive technology and has incorporated workarounds into the training. The following Easter Seals

Massachusetts webpage contains a constantly growing list of such success stories: http://ma.easterseals.com/site/PageServer?pagename=MADR_AssistiveTechnologyClientStories. These stories exemplify the following assistive technology truism: Assistive technology can make possible, what once was impossible. Reading these inspirational stories will give you some understanding of the pivotal role that this Easter Seals AT Program plays in transforming the lives of Massachusetts residents.

The success stories feature people of all ages who share the same deep appreciation for assistive technology and for this remarkable AT Program. We can read about a woman with cerebral palsy named Allison, who began receiving AT services from Easter Seals Massachusetts as a teenager and went on to receive her PhD in economics from MIT. She uses eyegaze technology to accommodate her disabilities with speech and mobility. She is quoted as saying "Assistive technology can literally open doors. It enables me to show the world what I can do and allows me to live the life I want. I'm so thankful to Easter Seals and its services." Here is the link to Allison's success story: http://ma.easterseals.com/site/PageServer?pagename=MADR_AllisonThompkins

We can read about a teenager named Jonathan who cannot speak, walk or use his hands due to a childhood illness. His computer skills were greatly enhanced by the assistive technology services that he received from the Easter Seals Massachusetts AT Program. His mother is quoted as saying, "It's so amazing how much better he can communicate and navigate on the computer now." She goes on to say that, "Whenever I hear anything about someone needing assistive technology, I recommend Easter Seals." Here is the link to Jonathan's story: http://ma.easterseals.com/site/PageServer?pagename=MADR_Atech-Jonathan

We can also read about an elderly woman named Marlena who suffered a stroke and has no feeling in her left side. She received a computer and AT training from Easter Seals Massachusetts. The power of assistive technology is evident when she asserts, "The computer brought me



Allison is shown here proudly receiving her PhD diploma at MIT's graduation ceremony.

to life." She expresses her gratitude for the Easter Seals AT Program when she says, "Not only did I get a computer, Easter Seals let Art (an AT specialist) teach me and every time I need help, I know how to get it. I'm very, very happy." Here is the link to Marlena's story: http://ma.easterseals.com/site/PageServer?pagename=MADR_MarlenaATprofile

We can even see how assistive technology can open up new possibilities for recreational activities as we read Michael's heartwarming story. He is a 3-year-old boy that was born without arms. The Easter Seals Massachusetts AT Program provided him a variety of AT services, including a modified toy electric car that he can now drive, thanks to adaptations made to the car's steering wheel by a team of Easter Seals AT specialists. His mother says, "He loves the car." And she explains, "Easter Seals has changed his life." Here is the link to Michael's story: http://ma.easterseals.com/site/PageServer?pagename=MADR_MichaelPerrino

One of the reasons why this particular AT Program is able to provide services with such great success is because its knowledgeable staff has a very valuable resource called the Device Loan Program, which is managed by Easter Seals Massachusetts and is funded by the state's MassMATCH

Program. The Loan Program includes a Boston Loan Center that has hundreds of assistive technology devices that any Massachusetts resident can borrow, free of charge, for one month. The vastness of the Loan Center's inventory affords the AT Program staff with the opportunity to borrow many different devices and find something that successfully meets the client's disability needs. Since each client has his/her own individual set of disability needs and level of ability, this trial and error method of trying different devices is the ideal approach for achieving optimum results. Also, using a device for an entire month is extremely beneficial because a client often needs to use a device for an extended period of time in order to accurately determine whether he/she can operate the device effectively.

During my AT training, the Device Loan Program played a key role. My Easter Seals trainer borrowed more than a half dozen items from the Loan Center for me to try. I use Dragon NaturallySpeaking voice recognition software, which often has compatibility problems with other devices, so trying multiple devices was an essential step in my training process.

Another reason for this AT Program's success is the fact that the Loan Center is perfectly suited for the diverse clientele of Easter Seals because it contains a diverse collection of AT devices. There are devices to meet the needs of many different categories of disabilities, such as vision, hearing, mobility, speech communication and cognitive ability. Consequently, the AT Program staff are able to provide training with AT devices that match the disability of each respective client. I encourage readers to visit the Loan Center's online inventory (http://www.massmatch.org/inventory/search_inventory.php), which vividly illustrates how today's world of assistive technology includes devices to meet the needs of nearly every person living with a disability.

Over the years, I have gotten to know the President of Easter Seals Massachusetts, Kirk Joslin. Like his exemplary AT Program staff, he is a firm believer of the importance of assistive technology and is very dedicated to the AT Program. He has always been very supportive of the various AT projects that I have undertaken, espe-



Michael enthusiastically shows his steering wheel adapted electric car.

cially in 2009 when I won a national video contest for users of assistive technology. If you would like to see a demonstration of the AT devices that Easter Seals Massachusetts has given me training in, you can view my contest winning video by clicking this link: <http://www.youtube.com/watch?v=H2KxdCjRIZM>

It's important to note that this 2009 video contest exemplified the influence of Easter Seals AT Programs across the country because a fellow top finisher in this contest was a recipient of AT training services from Indiana's Easter Seals AT Program.

Kirk once explained to me that a key reason why the Easter Seals Massachusetts AT Program is so successful is because the members of the AT Program staff engage in team meetings for brainstorming purposes. The staff members share their assistive technology knowledge with one another, which enhances the capabilities of each member. They also discuss their client experiences. This means that they know how a colleague has successfully provided AT services to a client with a specific set of disability needs and, thus, are better prepared when faced with a similar client in the future.

As the Easter Seals Massachusetts AT Program celebrates its 25th anniversary, I am keenly aware that my success story would not have been possible without the AT training from this praiseworthy AT Program. I am appreciative of just how much this AT training has improved my life. I now approach my daily activities with confidence because I know that the computer skills and Dragon expertise that I have attained through Easter Seals have given me the ability to do almost anything that others can do. Thanks to this outstanding Assistive Technology (AT) Program, I'm proud to say that I'm now a productive member of society. I'm truly grateful that Easter Seals Massachusetts has lived up to its motto: "To provide services to ensure that children and adults with disabilities have equal opportunities to live, learn, work and play." ■

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