

*Assistive Technology Resources for Children and Adults with Disabilities*

# Closing The Gap

*Solutions*

FEBRUARY / MARCH, 2014  
VOLUME 32 - NUMBER 6

**Using AT to Support  
Literacy Among  
Individuals with  
Moderate to Profound  
Disabilities**

**Video Modeling:  
Smartphones for Smart  
Teaching**

**DISCOVERIES: iOS7 and  
the iPad**

**Is it Possible?  
Accessible and  
Affordable Digital  
Tools for Students With  
Special Needs**

**What is Video Modeling?**

**Assistive Technology:  
How we do Business in a  
Rural Setting**

**Working with Speech  
Recognition and People  
who Have Visual  
Impairment**

[www.closingthegap.com](http://www.closingthegap.com)

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# 32<sup>nd</sup> Annual CONFERENCE

## Closing The Gap

October 15-17, 2014

PRECONFERENCE WORKSHOPS:

October 13-14, 2014

MINNEAPOLIS, MINNESOTA

## MARK YOUR CALENDAR - PLAN TO ATTEND!

**The Closing The Gap Conference is truly more than a conference,** it is a network of invaluable resources – teachers, therapists, clinicians, parents, end users and manufacturers – all emphatically working together to change lives with assistive technology. The 32<sup>nd</sup> Annual Closing The Gap Conference promises nothing less than excellence!

**Early registration, parent, student, group and other discounted rates are available.**

- **PRECONFERENCE WORKSHOPS** Day-long workshops, conducted by nationally recognized leaders in the field, providing in-depth professional skills necessary to successfully implement assistive technology in the lives of persons with disabilities.
- **OVER 200 PRESENTATION HOURS AND HANDS-ON LAB OPPORTUNITIES** Sessions describing and/or demonstrating successful strategies and practical applications of assistive technology for persons of all ages with disabilities.
- **COMMERCIAL EXHIBITS** Extensive exhibition area displaying and demonstrating state-of-the-art assistive technology products and implementation strategies.
- **CEUS AND ACADEMIC CREDIT AVAILABLE!**

Learn more at [www.closingthegap.com](http://www.closingthegap.com)



### \$30 RETURN DISCOUNT

A \$30 "RETURN" DISCOUNT is available to ANY past conference registrant and must be used by **JUNE 30, 2014**.

This discount can be used for any preconference workshops OR conference registration and is **IN ADDITION** to any and all other applicable discounts.

If registering online, you will be required to enter code **RETURN** at checkout.

## ONLINE REGISTRATION AVAILABLE APRIL 1, 2014

**Conference - Wednesday, Thursday, Friday, October 15-17, 2014** Includes Preview of Exhibits – Tuesday, October 14, 5:30 pm - 8:00 pm

Registration Received	On or Before June 30	July 1 - September 11	September 12 - October 2	October 3 - Onsite
<b>Standard Rate</b> Group Discount - 5 or more Group Discount - 8 or more <i>All group registrations must be received at the same time.</i>	\$440 Groups 5+ Deduct \$30 Groups 8+ Deduct \$50	\$490 Groups 5+ Deduct \$30 Groups 8+ Deduct \$50	\$515 Groups 5+ Deduct \$30 Groups 8+ Deduct \$50	\$540 Groups 5+ Deduct \$30 Groups 8+ Deduct \$50
<b>Parent Rate</b> (A letter describing your child's disability must accompany registration)				\$300
<b>Full-time Student Rate</b> (Proof of full-time student status must accompany registration)				\$300
<b>Presenter Rate</b>		\$350		\$400
<b>Exhibitor Rate</b>		\$350		\$400

Single-Day and Exhibit Hall Only Registration	Price
<b>Thursday Only - October 16</b>	\$300
<b>Friday Only - October 17</b>	\$150
<b>Exhibit Hall Only - Tuesday evening through Friday, October 14-17</b>	\$175

Preconference Workshops - Monday and Tuesday, October 13-14, 2014	Price
Includes Preview of Exhibits – Tuesday, October 14, 5:30 pm - 8:00 pm	
<b>Two-day Workshop, Monday and Tuesday, October 13-14</b>	\$490
<b>Monday, October 13</b>	\$275
<b>Tuesday, October 14</b>	\$275
<b>BUNDLED PRICING! Monday and Tuesday Bundle (\$60 savings)</b>	\$490



# Closing The Gap

## Solutions

### ONLINE RESOURCE DIRECTORY

A guide to the latest assistive technology products for children and adults with disabilities

[www.closingthegap.com/solutions/search/](http://www.closingthegap.com/solutions/search/)

2014

Online Edition

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#### ▶ PRODUCT GUIDE

- Hardware products
- Software products
- Other AT products

#### ▶ PRODUCER DIRECTORY

- A guide to nearly 300 manufacturers

#### ▶ ORGANIZATIONS

- ATA Centers
- State Organizations
- Other Organizations



*Just updated, login today!*

THE MOST COMPREHENSIVE ASSISTIVE TECHNOLOGY GUIDE AVAILABLE TODAY!

*This directory is the culmination of a year-round search for products for children and adults with disabilities. By knowing what initial steps to take, this directory will prove indispensable for development and implementaiton of this technology.*



# LIVE WEBINARS

Engaging and Interactive!

CEUs available for live webinars!  
(Sponsored webinars not included.)

Live webinars will be archived within two months.  
Archived webinars included with an online Closing The Gap Solution subscription at no additional fee.

**Register Online:** \$55 each (single-participant fee)  
[www.closingthegap.com/store/webinars/](http://www.closingthegap.com/store/webinars/)

## Switch Access for iOS 7 on the iPad - All Live!

**MONDAY, FEBRUARY 3, 2014**  
**10:00 AM - 11:30 AM CST**

This webinar will focus on switch access for iOS 7 on the iPad using both Voice Over and Switch Control. It will be a live demonstration and discussion, with the main focus on how to use and configure Switch Control with the Blue2, Tecla, Switch2Scan, J-Pad, Applicator, RJ Cooper Bluetooth Switch Interface and others. The live format will promote question and answer time and demonstrations on request, for both switch access within apps and switch access to the entire iPad.

**PRESENTER: DAN HERLIHY**

## Apps for Independence

**THURSDAY, FEBRUARY 27, 2014**  
**1:00 PM - 2:30 PM CST**

The iPad has proven to be a powerful tool in the classroom for students with diverse learning needs. As our students get older, it is important to develop skills that foster greater independence. With today's mobile technologies, we can provide many of our student's and young adults with tools that can allow them greater independence. This session will look at apps for daily living, vocational, personal and social, communication, behavior management and more. This session assumes that you have a basic understanding on how to use the iPad and its accessibility features.

**PRESENTER: MARK COPPIN**

## The Sound of Autism! These are a Few of My Favorite Tech Things

**THURSDAY, MARCH 6, 2014**  
**3:00 PM - 4:30 PM CST**

Participants will leave this fast-paced webinar with numerous examples of technology, including some of my favorite

apps, websites, curriculums and strategies specific to meeting the unique learning and behavioral needs of students with ASD. This "show and tell" comes to you from 30 years of working in the field of autism and sorting through a plethora of strategies and resources along the way. An interactive Web-based resource will be shared for participants to also add their personal favorites, because it's all about spreading the word!

**PRESENTER: SUSAN STOKES**

## Top Apps for the Diverse Learner

**THURSDAY, MARCH 27, 2014**  
**3:00 PM - 4:30 PM CDT**

The iPad is an excellent tool for meeting the needs of diverse learners. With over 1,000,000 apps available in the App store, there are so many apps that can meet the unique learning styles and needs of our students. In this webinar, participants will be provided with information on apps that can support learners in various educational settings.

We will cover the accessibility and universal design features built into iOS 7 and how to use them in classroom settings. Then participants will then explore ways to adapt classroom materials for delivery on the iPad to meet the needs of the diverse learner. We will then explore apps that can be used to make the diverse learner more independent in the classroom and that can assist students with unique learning challenges. This session assumes that you have a basic understanding on how to use the iPad and its basic accessibility features.

**PRESENTER: MARK COPPIN**

## Apps to Support Older Students

**THURSDAY, APRIL 17, 2014**  
**10:00 AM - 11:30 AM CDT**

The iPad has proven to be a powerful tool in the classroom for students with diverse learning needs. As our students get older, many struggle trying to keep up with the increasing workload. They may struggle with keeping up with reading and/or writing and start falling behind. There are are wide variety of apps that can be used to support the struggling readers and writers and provide them with tools to help them keep pace. This webinar will cover apps for adapting reading and writing materials, note-taking, classroom management, OCR (Optical Character Recognition, Word Prediction and more. This session assumes that you have a basic understanding on how to use the iPad and its accessibility features.

**PRESENTER: MARK COPPIN**

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### 90-Minute, Live Webinar Fees

Number of Individuals	Price Per Person
1 - 4	\$55
5 - 24	\$50
25+	\$45

### Don't see a date that works for you?

Contact us to coordinate a webinar for your group or organization!

**Closing The Gap**

## WEBINAR PRESENTERS:



**MARK COPPIN, B.S.**, is an Apple Distinguished Educator and the Director of Assistive Technology, Anne Carlsen Center for Children, Jamestown, ND.



**DAN HERLIHY** is an Assistive Technology/Technology Resource Specialist, Connective Technology Solutions, Inc., Hoosick, NY.



**SUSAN STOKES, M.A., CCC-SLP**, is an Educational Autism Consultant and Trainer, Fond du Lac, WI.

## LIVE WEBINAR SPONSORED BY



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[www.closingthegap.com/store/webinars](http://www.closingthegap.com/store/webinars)

## Gone Google? Accessibility Tools for Struggling Readers and Writers

**THURSDAY, FEBRUARY 6, 2014**  
**1:00 PM - 2:00 PM CST**

Millions of students use Google Apps for Education to create, consume and collaborate on information every day. However, many of these students, including struggling readers and writers, students with learning disabilities and English Language Learners, do not have the supports they need when working within the Google Apps environment. Attendees at this webinar will learn how Texthelp's cloud-based Google accessibility tools can help overcome this barrier by integrating support tools, such as text-to-speech, word prediction, text and picture dictionaries, study skills and more. These supports help to make common file types, such as Google Docs, PDF, ePub, KES and the Web, accessible through the Google Chrome Web browser on PCs, Macs and Chromebooks.

For those looking for a more traditional approach, the presenter will also discuss Texthelp's desktop offering, Read&Write Gold, and the supports it provides for Chrome and Google Docs directly from the Read&Write Gold toolbar.

Both of these innovative solutions for Google allow students with reading difficulties to have access to the same content as others on a wide range of devices at home, school or anywhere they are needed. This webinar is a must for anyone using Google in their school/district/college.

**PRESENTER: JASON CARROLL**, Product Marketing Manager for North America, Texthelp, Inc.



*Certificate of webinar participation available upon request.*

# 32<sup>nd</sup> Annual CONFERENCE

Wednesday, Thursday and Friday  
**OCTOBER 15-17, 2014**  
Preconference Workshops  
Monday and Tuesday, October 13-14, 2014  
**MINNEAPOLIS, MINNESOTA**

## CALL FOR PARTICIPATION



Closing The Gap's Annual Conference has an international reputation as a leading source for information on innovative applications of assistive technology for persons with disabilities.

The 2014 Conference builds on a tradition of providing a comprehensive examination of the most current uses of technology by persons with disabilities and the professionals who work with them.

Topics will cover a broad spectrum of technology as it is being applied to all disabilities and age groups in education, rehabilitation, vocation and independent living.

People with disabilities, special educators, rehabilitation professionals, administrators, service/care providers, personnel managers, government officials and hardware/software developers will share their experiences and insights at what has become known as the best educational AT conference in North America.

Groups or individuals who wish to participate in Closing The Gap's 2014 Conference should submit their proposals for one-hour and multiple-hour presentations as soon as possible.

**SUBMISSION DEADLINE: 2:00 pm Central Daylight Time, Thursday, May 8, 2014.**

### PROPOSALS

Closing The Gap will consider proposals for one-hour or multiple-hour sessions that describe and/or demonstrate successful applications of assistive technology for persons with disabilities.

Proposals are invited that report results of current applications; research; development of hardware, software or adaptive devices; model programs or procedures used by and for persons with disabilities.

Proposals for sessions that demonstrate the use of software programs, mobile apps, adaptive devices or the innovative use of assistive technology are highly encouraged – especially specific how-tos, tips and tricks and product comparisons.

Proposals should focus on practical applications, implementation strategies and best practices, rather than theoretical discourse.

Proposal content should be supported by evidence and should include quantitative performance data.

Proposals for open forums in which participants discuss, comment openly and share ideas and opinions relevant to a primary subject or focus are also encouraged.

### PROCEDURE

**ABSTRACT:** A 300- to 500-word abstract must accompany the proposal form.

**SUMMARY:** A separate, 100-word summary must also be submitted for inclusion in the Conference Directory.

**PROPOSAL FORM:** The proposal form must be completely filled out and returned with the abstract and summary or submitted online.

### NOTIFICATIONS

Confirmation of presentation proposal acceptance/declination, and confirmation of specific date and time of accepted presentation will be sent by the first week in August.

In offering to present a paper, it is expressly understood that the presentation may be scheduled at any time on any of the conference days at the discretion of the conference organizers.

Presenters will be expected to provide all handouts at the conference. In addition, handouts must be made available to Closing The Gap for posting on Closing The Gap's website.

Selected manuscripts submitted by conference presenters will be published in Closing The Gap Solutions. Guidelines for submitting materials for these proceedings will be sent upon confirmation of presentation acceptance.

### REGISTRATION

Presenters may register for the three-day (October 15-17, 2014) conference for \$350 if registration received on or before September 11, \$400 if received after September 11, (regular registration is \$490 / \$540).

Presenters do not have to register for the conference to present; however, only those presenters who have registered may attend conference sessions/exhibits other than their own.

All-day preconference workshops are scheduled for October 13-14 and cost \$275 for one day or \$490 for two days.

### "RETURN" DISCOUNT

A \$30 "return" discount is available to ANY past conference registrant and must be used by June 30, 2014.

This discount can be used for any preconference workshop OR conference registration and is IN ADDITION to any and all other applicable discounts.

If registering online, you will be required to enter and apply code **RETURN** at checkout.

Online submission available at:  
[www.closingthegap.com](http://www.closingthegap.com)

**Closing The Gap**  
526 Main Street, P.O. Box 68, Henderson, MN 56044  
Phone: 507-248-3294; Fax: 507-248-3810; Email: [info@closingthegap.com](mailto:info@closingthegap.com)

# Using Assistive Technology to Support Literacy Among Individuals with Moderate to Profound Disabilities

Reading this excerpt from Dr. Seuss' *I Can Read With My Eyes Shut!* resonates with us because as a speech-language pathologist and librarian, we know that the more students can read, the bigger the world is for them. But what if students have a hard time accessing text? What if they can't turn the pages of the book, speak the words on the page, understand the meaning of what's on the page and/or attend to the page? These are some of the difficulties that many students with moderate to profound cognitive and physical disabilities face when it comes to reading.

Imagine walking into our school library, full of eager students, ready to learn. The librarian has planned a lesson about Christopher Columbus for the upcoming holiday and is going to read a biography. However, this is an extraordinary school: the students here have cerebral palsy, Rett Syndrome, Down Syndrome and autism, among many other moderate to profound disabilities. Many are nonverbal. The teacher needs to make significant accommodations so that students can participate with this lesson. In our school, the librarian works closely with the speech-language pathologist to plan lessons and strategies to maximize the students' access and comprehension of the material being taught. In this article, we will show you both low-tech and high-tech adaptations we've developed and implemented to assist students in accessing and understanding

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“  
There are so many things you can learn about, but  
You'll miss the best things if you keep your eyes shut.  
The more that you read, the more things you will know.  
The more that you learn, the more places you'll go.  
If you read with your eyes shut, you're likely to find  
That the place where you're going is far, far behind.  
So that's why I tell you to keep your eyes wide,  
Keep them wide open . . . at least on one side!

books, thus opening their world to as many far off places as they can go.<sup>1</sup>

## ACCESS

The first step in helping a student with disabilities engage with and participate in reading is to provide them with access to print materials. One way is to use a predictable book, such as the classic *Bear Snores On* by Karma Wilson, and record the predictable line (“But the bear snores on. . .”) into a single message speech generating device (SGD), such as a one-step from

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<sup>1</sup> \*We have used these adaptations and resources mentioned in this article exclusively with students in the school setting; however, many of them are between the ages of 18 and 22. For that reason, we feel it should be noted that these resources and accommodations can also be used with individuals beyond the school years if desired.



**JENNY SHANKER**, MLS, Stratford Program, Arlington Public Schools, Arlington, VA. Jenny has worked as the librarian at the Stratford Program for the past three years. Previous to that, she was a children's librarian for the Arlington Public Library system. [jenny.shanker@apsva.us](mailto:jenny.shanker@apsva.us)



**RACHAEL SMOLEN**, M.S., CCC-SLP, Bucks County Intermediate Unit #22, Bucks County, PA  
Rachael began working for the Intermediate Unit this past August, working with students on a caseload, as well as serving on their assistive technology team. Previous to that, she worked in the Arlington Public Schools in Arlington, VA for 14 years, serving as a therapist to students, as well as being a member of the assistive technology team. [rsmolen@bucksu.org](mailto:rsmolen@bucksu.org)



Ablenet or a Mini-Com from Enabling Devices. Each time that line appears in the book, the student will have the opportunity to participate in reading. Going beyond the single message device, multiple pages can be recorded into a multi-message SGD, such as a LITTLE Step-by-Step Communicator by Ablenet, so that the individual can read multiple pages of a book or an entire book aloud.

Another way is to use the Bookworm by Ablenet. This allows an individual to access an entire book, though they may need assistance turning the pages by activating a capability switch with the pre-recorded pages. Lastly, a book can be adapted in programs, such as PowerPoint or Keynote and when a capability switch is attached to the computer, it becomes an adapted book so that the user is able to turn the pages (and possibly hear it read aloud) at their own pace. Please note, when adapting books, it is important to be aware of copyright laws so that you are using the material legally. We have included a few resources at the end to give you more information about this.

Finally, for students with visual and/or attention disabilities, we have adapted board books with materials, such as Bendaroos or Wikki Stix, which are wax-covered, bendable, reusable sticks. By placing them around a particular picture, we assist individuals by giving them tactile input. See photo 1.

## COMPREHENSION

Once we have determined how to assist an individual with accessing books, the next step is to figure out if the individual is learning from what they are reading – in other words, the comprehension piece!

Picture Symbols: One way we have found to work on this is by using photographs or picture communication symbols, such as those found in Boardmaker by Mayer-Johnson. These can be made ahead of time so that the evaluator is ready to ask the individual comprehension questions. Of course, depending on the level of the individual, the evaluator may want to offer two to four options of the correct answer (though the more options available, the more that needs to be managed by the evaluator). See photo 2.

The evaluator can read one or more pag-

es at a time and then hold the photos/picture symbols in a way that they are accessible to the individual (e.g., holding two options in front of the individual or placing the options on a board with Velcro or tape so that more options are available). We ask them to answer a question from the book and they choose the answer from the options presented to them.

A fun and engaging activity that we often do with our students is to create images for the characters, actions or concepts in a book and either print them out on paper or mount them onto popsicle sticks or strips of cardboard. This works especially well for dramatic stories. As we read a book together, students will listen to the story and hold up their picture(s) whenever that character or concept appears in the book. For nonverbal students, it's a way for them to demonstrate comprehension and attention to the book. If the student is verbal, it's an opportunity for them to describe what's happening in the story. It keeps the students' attention on

the story because they know they need to do their part when it comes up in the book.

iPad Apps: In addition to these low-tech ways of determining comprehension, there are a variety of iPad apps that can be programmed and used to supplement lessons. Tablets, like the iPad, are potentially difficult to use in a whole-class lesson because only one student at a time can see what is on the iPad. However, with an AppleTV (\$100) and a projector, which many teachers already have in their classrooms, the iPad becomes a tool that all students can view at the same time.

Two apps that we use extensively to ask comprehension questions are ChoiceBoard Creator (free) (See photo 3.) and See Touch Learn (free, but image libraries cost extra). You can program your own questions from the book and include images from either the iPad's camera or from the Internet. Another indispensable app is My ChoiceBoard (\$9.99). See



Photo 1: A student feels a carrot formed by Wikki Stix in a board book.



photos 4 and 5. Like the other apps, you can use images from the Internet or the iPad's camera in creating choice boards. Both of these apps are easily programmed to adapt lessons and allow students to show whether or not they understand the content of the lesson. Another app that we use is called Making Sequences, which assists with working on putting story elements in the correct order. Bitsboard (free) is another app that looks promising for our students. If you have access to an iPad, check out these apps and see how they can assist you and your students with comprehension skills.

**Websites:** We've found many websites that assist students with literacy. The following is a list of a few that can be very useful in bringing literacy and books to individuals with disabilities.

Tar Heel Reader is a free collection of user-created, accessible books covering a multitude of topics. Students can both read and create books. Books can be speech enabled and accessed using multiple interfaces, including touch screens, the IntelliKeys with custom overlays and switches. Search options include topics, ratings (some books are only appropriate for more mature readers), review status and language. The quality varies widely, but it's a great resource for free, short and easily adapted books. In addition, there are a variety of settings that can be changed, based on the reader's needs. If desired, a teacher/evaluator can create comprehension questions to go along with the book to ensure the student is gaining valuable information from the text. And it's useful for any budding authors in your classroom! See photo 6.

We Give Books gives immediate access to a collection of digital books published by Penguin Group. It requires users to create a free account, which gives anyone free access to hundreds of books that can be filtered by genre, author and age of reader. No school has an unlimited budget for books, so this is a great way to supplement your collection. If a computer is attached to a projector, a teacher can read a book aloud to the class while the students look at the pictures. Students can also access the books and turn the pages with a switch if they want to read independently; however the books are



Photo 2: A student demonstrates her comprehension of the book by listening to a question and choosing the right answer using picture symbols.



Photo 3: A student using the iPad app, ChoiceBoard Creator to demonstrate comprehension.



Photo 4: A student uses the iPad app, My ChoiceBoard, to show us that he understands what is happening in these books.

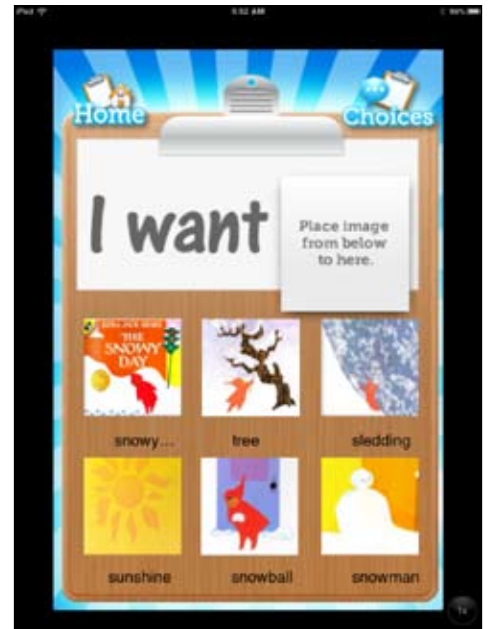


Photo 5: A screen shot from the My ChoiceBoard iPad app showing a lesson we created about Ezra Jack Keats' book, The Snowy Day.



Photo 6: This is an example of an adaptation that Rachael created to use with Tar Heel Reader.

not speech enabled on this website.

TumbleBooks is a subscription-only resource for animated, talking picture books. Many public and school library systems purchase subscriptions, so check with your local library or school district. For independent access, teachers can change the book's settings to "Manual" so the students can turn the pages with a switch or keyboard. In similar fashion to Tar Heel Reader, a teacher/evaluator can create materials to ensure the student is attending to and comprehending the material being read. See photo 7.

PebbleGo is a subscription-only research database for emergent readers. It's a superb way to introduce research concepts and skills to students. All text is read aloud and searching is done by pictures, rather than text. Students can explore four main databases: Animals, Earth and Space, Social Studies and Biographies.

Bookshare is an online library of digital books for people with print disabilities. It operates under an exception to U.S. copyright law that allows copyrighted books to be made available to people with qualifying disabilities. Bookshare members download books, textbooks and newspapers and then read the material using adaptive technology. This





Photo 7: Rachael created this comprehension tool to use with TumbleBooks.

service is free, but requires registration, and each user must have a documented qualifying disability. Many school districts have a coordinator who handles Bookshare registration.

Baltimore City Public Schools Adapted Library has books that have been adapted using picture communication symbols from Boardmaker, a Mayer-Johnson program. If you have your own copy of the book, you can print the symbols and glue them into your book so that you can read it to your students.

Let's Book It With Tech"Knowledge"y, a website developed by Vicki Blackwell has many low- and high-tech ideas for how to create and adapt books for students.

Inspiration is easy to come by in our line of work because we spend our days with the magical combination of books and our very special students. One of our favorite quotes to think about when going about our work is this one, commonly attributed to Jacqueline Kennedy Onassis: "There are many little ways to enlarge your child's world. Love of books is the best of all." Stories enrich our lives; it is the birthright of us all, no matter our abilities. We are obligated to bring this sense of wonder to all of our students, but we know that significant obstacles are in their way.

Our work of giving them access to the books and aiding them in comprehension gives them the keys they need to unlock the wonderful ideas found in books. If we can enrich the lives of students by giving them books and adapting them so they are able to access them, attend to them and glean meaning from them, then we will have enlarged their worlds.

## RESOURCES

Resources for Making Adapted Books

Gallagher, R. (2011, January 26). Adapting books for computer access. [Web log posting.] Retrieved from <http://adaptingcreatively.blogspot.com/2011/01/adapting-books-for-computer-access.html>

This website has a good tutorial on using PowerPoint to create adapted books.

National Library Service for the Blind and Physically Handicapped (1996). NLS factsheets: Copyright Law Amendment, 1996: PL 104-197 December 1996. Retrieved from <http://www.loc.gov/nls/reference/factsheets/copyright.html>.

Factsheet on the Chafee Amendment from the National Library Service for the Blind and Physically Handicapped (NLS).

Walter, R. (2002). How to create talking books in PowerPoint 97 & 2000.

Retrieved from [http://atto.buffalo.edu/registered/Tutorials/talkingBooks/ppt\\_ace.pdf](http://atto.buffalo.edu/registered/Tutorials/talkingBooks/ppt_ace.pdf).

A thorough tutorial on adapting books using PowerPoint. Note: the legal information contained in this document pertains to laws in the UK but it is otherwise relevant.

## IOS APPS

See Touch Learn (free but image libraries cost extra), <http://goo.gl/AldnOX>

Making Sequences (\$4.99), <http://goo.gl/WLRZmE>

My Choice Board (\$9.99), <http://goo.gl/31OCYw>

Choice Board Creator (free), <http://goo.gl/3OAL65>

Bitsboard (free), <http://bitsboard.com/>

## WEBSITES

Tar Heel Reader: [www.tarheelreader.org](http://www.tarheelreader.org)

We Give Books: [www.wegivebooks.org](http://www.wegivebooks.org)

TumbleBooks: [www.tumblebooks.com](http://www.tumblebooks.com)

PebbleGo: [www.pebblego.com](http://www.pebblego.com)

Bookshare: [www.bookshare.org](http://www.bookshare.org)

Baltimore City Public Schools Adapted Library: <http://goo.gl/O6Dc2R>

Let's Book It With Tech"Knowledge"y: [www.vickiblackwell.com/makingbooks/](http://www.vickiblackwell.com/makingbooks/)

Vendors: The following is a non-comprehensive list of vendors from whom the assistive technology we spoke about in this article can be purchased.

Ablenet: [www.ablenetinc.com/](http://www.ablenetinc.com/)

Enablemart: [www.enablemart.com/](http://www.enablemart.com/)

Enabling Devices: [www.enablingdevices.com](http://www.enablingdevices.com)

Mayer-Johnson (Boardmaker): [www.mayer-johnson.com/boardmaker-software/](http://www.mayer-johnson.com/boardmaker-software/) ■



# Video Modeling:

## Smartphones for Smart Teaching

As technology grows, more and more people have smartphones readily available. You may be thinking that this article is going to inform you how to take advantage of the thousands of apps that already exist. But, it's not. Sure, there are lots of apps that are targeted to help our special kids immensely, but sometimes there's just not "an app for that." So what else might I be suggesting to do with that wonderful device that also makes phone calls? Use your camera feature and make a video of what you want your child or student to learn. I'm talking about video modeling. If your child or student is a visual learner, a video approach can have a profound impact!

### AN INSPIRATIONAL STORY

I first realized how powerful videos could be when I saw my own son Ryan, then almost 5 and diagnosed with autism, completely imitate a dance video he was watching. It made me think. He had been struggling with handwriting for almost two years. In fact, he wouldn't even go near a crayon without having a tantrum. I wondered if he would imitate someone writing if I put it on TV. So, I made a video of his occupational therapist, Marnie Danielson, writing the letter "c." She sang these wonderful rhythmic

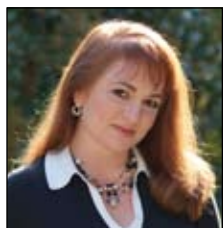
chants (prompting how to form the letter) that she had always sung with Ryan in her clinic. Although she had used this demonstration and singing technique for months, it never seemed to click with him. It occurred to me that he never had that instruction in a flat screened, non-imposing, non-invasive, visual approach. For some reason, I just knew that was exactly what he needed. He needed this visual piece. The video we made went through several different types of writing. Working on the ABA (Applied Behavior Analysis) design of "generalizing" (Stokes & Baer, 1977), we demonstrated writing on a chalkboard, as well as on paper. By continuing these demonstrations, we also worked on the repetition aspect that is so critical for our ASD children to learn. Additionally, we added props to keep his attention and help make it fun.

When I showed Ryan our three-minute video, he asked to watch it again. To my surprise, he was smiling. He was "getting it." After the second viewing, I put a marker in his hand and he didn't throw it. He was singing the chant and trying to write. We had a breakthrough! Wow. Could that be all that was needed? After two years? Well...yes. It wasn't that he couldn't do it; it was that we weren't teaching it to him in the way he needed to learn.

### AN EVIDENCE-BASED PRACTICE

Video modeling is defined as a form of observational learning in which desired behaviors are learned by watching a video demonstration and then imitating the behavior of the model. Much to my surprise, what we had successfully experienced with Ryan was a method of teaching children with autism that has been around for decades. This type of instruction has actually been researched since 1970 (Creer & Miklich, 1970). Marnie and I have now made several professional, award-winning handwriting videos over the past eight years. And we consistently hear from families around the world that nothing else would get their child to write until they watched our videos – obviously not just a "Ryan phenomenon."

Most research projects on video modeling have focused on various communication, functional, academic and behavioral areas (Charlop-Christy, M., Le, L., & Freeman, K, 2000; Creer & Miklich, 1970; Kinney, E., 2003; Marcus & Wilder 2009; Sherer, et al, 2001). They have concluded that video modeling has proven to be a more effective method than live or "in vivo" teaching (Charlop-Christy, M., Le, L., & Freeman, K, 2000).



**SUSAN ELLIS** is the mother of two boys on the autism spectrum. She has been interviewed on CNN, NBC, CBS and various radio stations. Ellis is a published writer and national speaker on video modeling and visual strategies, and she will be at the Closing The Gap conference in 2014. Ellis is the co-creator, producer and director of The TV Teacher, LLC, which produces award-winning handwriting programs using video modeling. To learn more about The TV Teacher handwriting programs and watch video demonstrations, please visit: [www.thetvteacher.com](http://www.thetvteacher.com) 866-971-0450. Susan Ellis can also be reached at [info@thetvteacher.com](mailto:info@thetvteacher.com).

The research has shown well enough to support the criteria for the Center for Exceptional Children guidelines as an evidence-based practice (Bellini, S., & Akullian, J., 2007).

So why does a video modeling approach work so much better? The researchers' suggestions concur with our own experiences (Corbett, B., & Abdullah, M., 2005).

- First, the TV restricts the field of focus for children. Ever try and call a child's name when he is watching a video? They are so engaged that they are ignoring what is happening around them.
- Teaching through videos can also reduce the sensory component, which can be overwhelming for many children – especially for those on the autism spectrum. For example, a child smelling your floral shampoo, your hair tickling his cheek, hearing another child screaming in the hallway and constantly being asked to make appropriate eye contact can usually overload his sensitive sensory system. He might be too distracted to be completely engaged in what you are trying to teach him.
- Another feature is that videos are very motivating...for any child, even adults. For some reason, when we see things on TV, we believe it. We want it. We want to re-enact it.

If we can eliminate the distractions, reduce the sensory aspect and restrict the focus, we might have a better shot of gaining the child's attention for a few minutes. So, try teaching a new task using this motivating method: a fun, non-confrontational approach.

## A NEW APPROACH

Recently, I was asked by a public school county to give a presentation on video modeling to their staff of special needs Pre-K teachers. A few months later I was enthusiastically approached by one of the teachers who was amazed at how she was finally making breakthroughs with her students. Using the video modeling guidelines I suggested, she had successfully helped "Tommy" match colors in only a few minutes (See photo). This had been a goal that they had previously worked on for months

with no progression. Happily amazed, this teacher then took on the daring task of trying to get him to brush his teeth. This was something that Tommy's mom had been struggling with for years due to his severe sensory aversions. It only took the teacher one video and a couple of days, and Tommy was brushing! Since most of the children in this teach-

er's classroom are on the autism spectrum, she has significantly augmented her teaching approach to use video modeling. As she mentioned, "Instead of being constantly frustrated, I've turned to video modeling and they are totally getting the concepts...and FAST!"



Tommy matching colors independently!



Video created to help Billy learn to point at verb cards.

## WHEN IS THE OPTIMAL TIME TO USE VIDEO MODELING?

As parents and educators of children with special needs, you probably have already inundated your walls with choice boards, schedules and first/then visual charts – all fantastic visual tools. Just like the Tommy story above, video modeling excels when it comes to teaching your child something ACTION oriented. Tying shoes, playing a board game with someone and interacting with a doctor are just a few examples of actions where our children have a very hard time learning HOW to participate. A research project by Mechling, L. C. & Gustafson M., (2009) demonstrated this concept perfectly. Using six adults with moderate intellectual disabilities, she compared cooking tasks using pictures vs. videos. These were relatively simple cooking related actions, such as peeling a carrot or chopping a cucumber. The tasks taught through video were imitated more accurately than those using static picture cards. Toward the end of the project, all the tasks that were shown



Video modeling using a “point of view” approach



The TV Teacher handwriting program uses a video modeling approach.

using static pictures (which were never quite perfected in imitation) were then shown using a video approach. The students finally mastered them! It wasn't that they were incapable of doing the tasks; they just needed to be shown in a more effective manner. Cooking uses action.

## THINK OUTSIDE THE BOX

Hopefully your mind is now fluttering with thoughts of what your child/student has been struggling with and that maybe video modeling could help. Ask yourself: Is it possible it's a struggle because it is action oriented – maybe even peripherally?

Over a Saturday morning coffee, my friend, another teacher of a special needs pre-K classroom, had told me about “Billy,” one of the boys in her class. He was being tested on identifying verbs. She knew that Billy knew these verbs, but he was not pointing to them when asked. So he was failing these tests. She was frustrated because the speech therapist wasn't able to give him any credit unless he physically pointed to the correct card. Pointing = action! I had my friend come to my house and with the aid of my two sons, we made a video of each boy pointing to the correct verb card when asked auditorily. That Monday, she began showing Billy our one-minute video. After seeing it only a few times, he went from his previous scores of 40 percent to a 100 percent! As she suspected, the little boy knew all the information; he just needed to be shown what action was expected of him. Billy is now generalizing this pointing skill to other areas, like identifying colors, answering class questions and picking out his own choice breaks.

## WHO SHOULD YOU FILM?

Since you now know the “why,” “what” and “when” of video modeling, let's talk about the “who.” I am consistently asked if there is data supporting which “model” is most effective to learn from – an adult or a peer? From the research that I have reviewed, collectively there is no steady evidence one way or another (Ihrig, K., & Wolchik, S.A., 1988, Sherer, M. et al., 2001, Santini, M., 2007). It depends on whom your child or student

would respond to best. Who can you film that would be the most engaging for your child/student? Sometimes, it's you. If so, prop up your camera and film yourself. You don't have to put your video on the Internet; so don't worry if you're not looking fabulous. Film it and show it. That's all there is to it. If you're overly camera shy, you can try something called a “point of view” approach. Film the action from the perspective of the viewer so they'll see exactly what it should look like through their eyes. In other words, turn the camera so it faces the same direction you are looking at and film what you want them to do with their hands. If the skill is to teach them to stack blocks, all that should be filmed are your hands stacking the blocks.

## NOW IT'S YOUR TURN

If you have a smartphone or a tablet with video capability, there should be no excuse not to try this concept right away. Don't worry about editing and adding titles, or even background music. A simple video could take just a few minutes of your day, yet could help that child forever. Keep in mind that if you help teach a skill today, you can build upon that skill tomorrow. ■

## TIPS TO A GREAT VIDEO MODELING LEARNING TOOL:

- Make it simple – One task at a time
- Make it short - 30 seconds to three minutes is plenty of time
- Make it fun – Adding a song to your action or engaging the viewer by calling out his/her name is a great way to get their attention.
- Make it repetitive – Repeat the action several times and, if possible, try to generalize the skill in the video (different colored blocks, multiple verb cards, different people, etc).



# DISKoveries

## iOS7 and the iPad

By Joan Tanenhaus

Apple's new operating system for the iPad and iPhone has many new and exciting features, but the most impressive for those with special needs is the inclusion of switch control and scanning.

This article is not meant as an instruction guide in using switch control (some references for that are included later). It is more of an introduction to the features that Apple has included. Switch control can be turned on by going to Settings>General>Accessibility and then scrolling down to Physical & Motor. Users first have to pair their Bluetooth switch interface with the iPad, a simple process that usually gets done once at the beginning of the set-up process.

### SOME OF THE SWITCH CONTROL OPTIONS INCLUDED IN IOS7 :

- Single switch with auto scanning and adjustable scanning rate
- Two-switch with step scanning
- Ability to scan individual icons or to group them (row-column scanning) for faster



iPad with Switch Control (www.apple.com)

- navigation (Not all apps have the icons arranged in clear rows, but the iOS7 scanning attempts to cluster nearby items.)
- Ability to include additional menu items in the scanning cycle, including home, scroll, gesture and saved gestures that you can

create

- Ability to set number of loops between 1-10 (number of times that the cursor will scan through the scanning cycle)
- Hold duration (the duration that the

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switch must be held down before a press is recognized – for those who might accidentally press the switch during the scanning process)

- Ignore repeat (the duration in which multiple presses of input are treated as a single input – for someone who might hold down the switch for a longer time than required to input)
- Gliding cursor speed (the speed at which the gliding cursor moves across the screen)
- Ability to add speech to scanning so icons and menu items (if desired) are named
- Adjustable speaking rate
- Ability to select a large cursor (scanning box is thicker and easier to see) and to change the cursor color

In addition to Switch Control (with external switch), users can set the screen as switch and to also set what the iPad will do when the screen is touched (such as pause).

With the Camera setting, you can designate a head movement (left movement and/or right movement) to perform an action, such as Go to Home Screen. These three modes can be used together.

With some practice, users will be able to scan through apps, select the one they want and control some of them. It should be noted that the new Switch Control does not work with all apps – each app developer needs to build in support for this new access. But Apple has really put a lot of effort and thought into switch control and hopefully this is just the beginning of true iPad switch accessibility.

There are many video tutorials online that will help you learn how to connect your switch and set up Switch Control. Here are a few links to start with:

- <http://www.youtube.com/watch?v=rLNhZsz9wH8>,
- <http://www.youtube.com/watch?v=fqWkNx27DM>
- <http://www.youtube.com/watch?v=SnDA2pbBsTQ>
- <http://www.youtube.com/watch?v=rLNhZsz9wH8>
- <http://www.youtube.com/>

[watch?v=JuLETwuxSbs](http://www.youtube.com/watch?v=JuLETwuxSbs)

#### For excellent print resources:

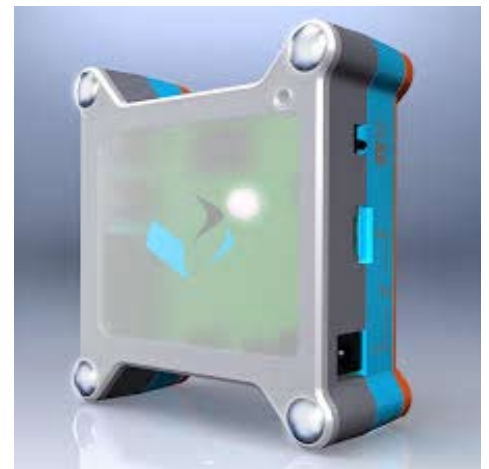
- <http://www.assistiveware.com/support/faq/page/289>
- Ablenet 's iOS 7 Switch Control: The Missing User Guide: <http://www.able-netinc.com/Portals/0/KnowledgeBase/Manuals/iOS7-UserGuide.pdf>

Let's also remember that there are many apps that have switch access built into them by the developers. These include some AAC apps, as well as a large group of cause and effect type apps. These also require a switch interface, many of which have been reviewed previously in DISKoveries (see list below), and are an easier option for beginning users to master. However, these don't let the user move from app to app or to navigate around the iPad.

These apps with built-in switch accessibility require the use of a switch interface. See below for listing of switch interfaces that work with both these apps and the new Switch Control built into iOS 7.



New Blue2 Switch ([www.ablenetinc.com](http://www.ablenetinc.com))



Tecla Shield Dos ([www.komodoolab.com](http://www.komodoolab.com))



Pererro ([www.tfeinc.com](http://www.tfeinc.com))

## SOME DEVELOPERS OF APPS WITH BUILT-IN SCANNING OR CAUSE AND EFFECT INCLUDE:

- AbleNet: [www.ablenetinc.com](http://www.ablenetinc.com) (Sounding Board)
- Alexicom: [www.alexicomaac.com](http://www.alexicomaac.com) (Alexicom AAC)
- AssistiveWare: [www.assistiveware.com](http://www.assistiveware.com) (Proloquo2Go)
- Attainment: [www.attainmentcompany.com](http://www.attainmentcompany.com) (Go Talk Now, Show Me Math, Attainment's Community Success)
- Computerade: [www.computerade.com](http://www.computerade.com) (Catch the Cow, Sentence Match and Sentence Key apps)
- Creative Communicating: [www.creativecommunicating.com](http://www.creativecommunicating.com) (Adapted Play Books)
- Inclusive: [www.inclusivetlc.com](http://www.inclusivetlc.com) (Peeping Musicians, Big Bang Pictures, Five Sharks Swimming, Bumper Cars and many others)
- Judy Lynn: [www.judylynn.com](http://www.judylynn.com) (Switch Accessible Puzzles, Switch Accessible Mazes, Switch Accessible Matching – Bundles # 1, 2, 3, & 4 – see review below)
- LIFEtool Solutions: [www.lifetool.at](http://www.lifetool.at) (Switch Trainer, Switch Trainer Lite, TouchMe Hokus Pokus, TouchMe PuzzleKlick – see reviews below)
- Laureate Learning: [www.laureatelearning.com](http://www.laureatelearning.com) Scanning & single switch use will be added to the Laureate First Words app in an upcoming update. See review below.
- Marblesoft: [www.marblesoft.com](http://www.marblesoft.com) (Scan and Match, Switch Kids, Sights & Sounds, I Can Help, Recycle It, My Country, A Leader is...)
- TapSpeak [www.tapspeak.com](http://www.tapspeak.com) (TapSpeak Choice AAC, TapSpeak Sequence, TapSpeak Button)
- Therapy Box: [www.therapy-box.co.uk](http://www.therapy-box.co.uk) (Predictable, Scene&Heard)

## NEW IPAD/IOS7 SWITCH INTERFACES

**New Blue2 Switch** (AbleNet: [www.ablenetinc.com](http://www.ablenetinc.com)) The New Blue2 Bluetooth switch

(switch interface) provides single or two-switch access to all devices (iPad, iPad Mini, iPhone) running iOS7, as well as to Apple desktop or laptop computers running OS X Mavericks, and all switch accessible apps or software on iOS, OS X, Windows and Android. Blue2 connects via a Bluetooth connection that is very easy to pair/connect – after charging the new switch and turning it on, it is easily discoverable and connects with a simple touch to your iOS device. (I have not tried connecting to Android or Apple computers, but am told by others that it is easy too.) A nice feature of the New Blue2 Switch is the inclusion of wall adapters for all different outlets – two round pins (Europe & Asia), two flat angled blades (Australia, New Zealand, Fiji, China), two flat parallel blades (North and South America, Japan) and three-prong rectangular blades (Africa, Hong Kong, Great Britain, Ireland). Adapter plugs allow plugs to fit into international outlets – they do not convert electricity. The new Blue2 contains two switch activation surfaces that are easy to press – or connect your individual switch/switches via two switch jacks so that any and all switches can be used to control the interface. For access to the new Switch Control, you go to Settings->General->Accessibility->Switch Control to turn on auto scanning and to customize the switch access to your individual needs. As indicated above, watch the recommended videos for step-by-step instructions on set-

ting up the iOS 7 Switch Control. You can also continue to use switch adapted apps, as mentioned above, and are able to use preprogrammed modes to accommodate the standard protocols used for switch access to apps. You can also program the switches to be key combinations (i.e. Space and Enter, or any other combination you want). If you are using an iOS device with Blue2, activating the keyboard toggle button, located on the side of the interface, will bring up the on-screen keyboard. After 30 minutes of inactivity, Blue2 will go into sleep mode to save battery. (The Original Blue2 Bluetooth switch provides single or dual switch access to switch accessible apps. It is not compatible with Switch Control in iOS7 or OS Mavericks.)



APPLICator Switch Interface ([www.inclusivetlc.com](http://www.inclusivetlc.com))



Bluetooth Super Switch ([www.rjcooper.com](http://www.rjcooper.com))



**Tecla Shield DOS** (Komodo: [www.komodoopenlab.com](http://www.komodoopenlab.com)) The Tecla Shield DOS, a wireless Bluetooth device, lets users control the iPad and similar touch devices with two external switches, as well as with the driving control of their power wheelchair. The Tecla is 3.5 inches x 3.25 inches x 1.5 inches, with a rechargeable battery that lasts four days. In two-switch scanning with the Tecla Shield, Switch 1 starts the scan happening and Switch 2 selects the item when the scan gets there. It works with iOS, Android, Windows, OS X or Linux devices. In drive mode with the wheelchair, users can switch between driving the chair or using the iPad or other device with joystick control. They can also access the on-screen keyboard to compose emails and text messages or enter text whenever needed. The Tecla Shield DOS also enables switch access to the voice dictation key in the iOS built-in keyboards. This allows the user to use their voice to enter text into any text box. The Tecla works with iPad, iPod Touch (3rd and 4th generations), iPhone (4, 4S and 3GS) or Android. (As with the Blue2 Switch, I only tried the pairing and switch use with Switch Control on the iPad, not on other tablets.) Visit the Tecla website for more information and some videos about its use with a switch.

**Pererro** (RSL Steeper: [rslsteeper.com](http://rslsteeper.com), available for more information and purchase from Technology for Education, Inc, [www.tfeinc.com](http://www.tfeinc.com)) Pererro is a small (about 1-inch square) plug and play adapter that connects through the Apple lightning or 30-pin connector. Small, but powerful, the Pererro gets its power directly from the iOS device, without any batteries, and provides access to iOS on iPod touch, iPhone and iPad without having to deal with Bluetooth connectivity. Before connecting the Pererro, users download the free Pererro app and set it up. Settings are stored within Pererro and therefore don't need to be set up on different devices. Users plug their switch directly into the Pererro's 3.5mm minijack plug. (You can even charge your iPad without disconnecting Pererro.) Pererro works with almost any voiceover enabled app. Voiceover has been updated by Apple and now has features such as support/access for different gestures, Braille display mirroring, autospeaking Web pages, and spoken hints. It can be used to access music, iBooks, turn pages, message, call or email, use environmen-

tal control apps and more. With Pererro, together with Voice Over, users can scan through on-screen icons/selections and select desired app with a press of the switch. There are two scan modes: Auto Increment (autoscan) and Press to Increment (Step Scan). Watch for some more features to be added to the Pererro and the addition of the Pererro 2, which will let users connect up to two switches and will use Apple's Switch Control for scanning.

**Bluetooth Switch Interface and Bluetooth Super Switch** (RJ Cooper: [www.rjcooper.com](http://www.rjcooper.com)) RJ Cooper has updated his Bluetooth Switch Interface and Super Switch. They are now easily paired for Bluetooth access and both will work with the new iOS 7 Switch Control, while still also working with switch adapted apps.

**Applicator Switch Interface** ([www.inclusivetlc.com](http://www.inclusivetlc.com)) This Bluetooth switch interface provides access to both apps and music, with up to four switches. Switch sockets default to the most frequently used settings (space, enter, 1, 3) but you can also re-program them into 24 mouse/keyboard commands (i.e., up arrow, down

arrow, play/pause, volume up, down, mute and others). You can use a switch and the Applicator to take pictures with the iPad, and the Applicator will also let you bring up the on-screen keyboard manually at any time.



The iPad Pen ([www.hammacher.com](http://www.hammacher.com))



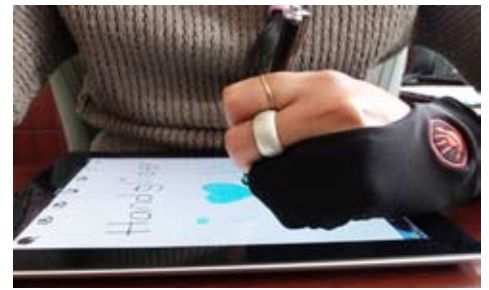
Ergo Stylus ([www.thepencilgrip.com](http://www.thepencilgrip.com))

## IN ADDITION TO THE SWITCH CONTROL, THERE ARE MANY OTHER NEW FEATURES IN IOS7. HERE ARE SOME NEW, INTERESTING AND USEFUL ONES:

1. If there is no “.com” key on the keyboard you are using, tap and hold the (.) to make a pop-up menu appear. Then slide your finger to the .com button. Tap and hold the dollar sign (\$) key, to find other currency symbols. Tap the 123 key and without removing your finger, slide to the question mark or to other punctuation marks you want.
2. Add Emoji (those little picture icons) by adding a keyboard (Settings → General → Keyboards → Keyboard. Tap Add New Keyboard and scroll down until you find Emoji. Tap it to add it to your keyboards. When you are writing, touch the small globe key at the bottom of the keyboard to change keyboards.
3. Another new feature of iOS7 is the ability to send photos, contacts and other information from one iOS device to one or more other devices through AirDrop. AirDrop works for Photos, Safari, Contacts, Notes, Reminders and Cameras. You enable it by opening the Control Center and turning it on. Learn about the different features to send and receive.
4. iOS7 also lets you launch Siri or press the Home Button by simply tilting your head. This uses the same technology explained above in the Switch Control.
5. iOS7 updates your apps in the background, saving you much time. You can turn automatic app updates on or off by going to Settings → iTunes and App Store. Notice that there is an option to use Cellular Data for these downloads. Most of us will prefer to keep this off, so that we get no extra charges for data during these updates.
6. Folders in iOS7 are now unlimited in size. You can put in as many apps as you want. Great for organizing apps.
7. Pages, Numbers, Keynote, iPhoto and iMovie are FREE on iOS devices purchased after September 1, 2013.
8. Keyboard Shortcuts: You can now create your own keyboard shortcuts (abbreviation/expansion) – to make it easier and quicker to enter often repeated text.
9. iOS7 now has Face Time Audio ... over Wi-Fi you can now make video calls. Just select the telephone icon when placing your call. You can go from a FaceTime audio call to a FaceTime video call without hanging up. But once you're using FaceTime video, you can't switch back to audio only.
10. Other accessibility options included in the iPad are: Zoom, Large Text, ability to invert colors (white text on black background), Speak Selection, Speak Auto Text, Assistive Touch (use single touch to enter multi-touch gestures), Guided Access (locks in one app and prevents the use of the home button to exit the app) and support for Bluetooth wireless Braille displays.
11. iOS 7 will run on the iPhone 4, 4S, 5, 5C, and 5S. It will not work on the iPhone 3GS. As for the iPad, iOS 7 will run on the iPad 2, the Mini and the new iPad Air, but not the original. iPod Touch users need the fourth or fifth generation of the device.

## IPAD ACCESSORIES

**The iPad Pen** (Hammacher Schlemmer: [www.hammacher.com](http://www.hammacher.com)) This is an add-on system with a wireless stylus that lets you use your iPad for taking notes, writing emails, making handwritten notes on documents, filling in forms, annotating PDF files and much more. You download the free iPad app, plug a small base unit into the charging port of the iPad, calibrate the screen, launch the application and you are ready to write on the screen. After a little practice, you will find a position that's comfortable for you for writing. The system also has Palm rejection: you can lean your palm on the capacitive screen during writing and it won't interfere or input into the iPad. It works with free downloadable apps, such as IdealNotes or FlyNotes, and can be used to turn your iPad into a draw-



The Hand Glider ([www.theHandGlider.com](http://www.theHandGlider.com))

ing tablet. Work is saved as .jpg images, allowing them to be edited, shared via e-mail or transferred to a computer.

**Ergo Stylus** (The Pencil Grip, Inc.: [www.thepencilgrip.com](http://www.thepencilgrip.com)) The company that brought us the Pencil Grip, the leader in ergonomic writing aids, now has developed a stylus for capacitive screens with the Pencil Grip built right into it. Ideal for drawing and handwriting apps, the built-in pencil grip is good for both right and left hand use. Righties place their thumb on the “R” – while Lefties place the thumb on the “L.” The other fingers just naturally fall into place. It works on all smartphones, tablets and Smart Boards, for both children and adults. Ergo Stylus measures approximately 5.5-inch long, 0.3-inch wide in the barrel, and 1-inch at the widest part of the grip.

**The Hand Glider** (The Hand Glider: [www.theHandGlider.com](http://www.theHandGlider.com)) This iPad accessory will help those who have difficulty pointing and selecting because they accidentally input to the tablet with the palm or side of their hand. This is a specially made two-finger glove that covers parts of the wrist and palm, pinky and ring finger and keeps them from being detected by the tablet. It lets the user rest their hand on the tablet. It comes in three sizes and can be used on both the right hand and the left hand.

# New and Noteworthy Apps for the iPad

## KEY

\* - A lite or free version is available

A - An Android version is available

Brief Review-- All apps tried on both regular iPad and iPad Mini. Check on iTunes, developer's website and YouTube for more details, pictures and videos

Producer/website	Brief Review
<b>Keeling &amp; Associates</b> ( <a href="http://www.keelingandassociates.com">www.keelingandassociates.com</a> )	Very well done programs to help develop ability to create 3-9+ word grammatically correct sentences, as well as functional sentences.
Sentence Assembly	Scrambled sentences: arrange the words to make a complete sentence. Picture clues. Level 1 – all the words with capitalization & punctuation; Level 2 – capitalization but no punctuation; Level 3 – all words in lower case and no punctuation. Options to speak selected words, complete sentence, m/f voices and to choose length & type of sentences to work on. Tracks history and can email results.
Question Assembly	Same format as Sentence Assembly but with questions. Can choose which wh questions to work with. Question Packs with additional sentences will be available in the future as in-app purchase.
<b>Smarty Ears</b> ( <a href="http://www.smartyearsapps.com">www.smartyearsapps.com</a> )	This company has been a leader in creating high quality and a large variety of apps for speech-language pathologists. Excellent video tutorials on all apps
Sentence Ninja	Single or multi-player app with Ninja theme that works on word order skills, with 39 levels, from simple phrases to complex sentences, each with a picture. Drag the words to a sentence strip. Options to display hint, provide color coded cues, record answer and present randomly or by levels. Individual sentences and level by structure (i.e. Article+Subject+Past Tense+Adverb) can be selected. Can also select to present the punctuation with word or separately. Record keeping, data tracking and ability to print homework sheets (included) to reinforce concepts.
Basic Concepts Skills Screener	App to evaluate receptive basic concepts skills, student points to or touches the screen to identify correct picture from a group of four. Report is generated. Full screening has 79 items; quick screening 30 items available. Data collection, report, email/print capabilities. Manual and video tutorial provided. Evaluates spatial, quantitative, comparative and temporal concepts. Tester can add notes throughout the assessment. English & Portuguese.
Describe It To Me	Multi-level game to work on receptive and expressive language skills, game-show setting. Each of 160 pictures has six questions with multiple choice answers. Designed to teach a deeper understanding of everyday items and develop semantic knowledge. Questions are read aloud. Data collections and report options.
Syllables Splash	* 1000 pictures and words from 1-4 syllables in length to teach syllable segmentation in under-the-sea setting. Choose level of syllable difficulty and response for an incorrect answer, use pictures or words, and number of foils. Select your own choice of words. Tracking and report card.
Expressive	Entry to mid-level AAC app for helping children express their wants and needs through the use of pictures and symbols. Tap buttons with symbols that speak. 10,000 built-in images from the Smarty Symbols library. Easy to use – create folders and arrange images easily. Works with iPhone, iPod Touch and the iPad. Add your own images, lock feature, landscape or portrait mode, male or female voices.
Phono Learning Center	Based on evidence-based Cycles technique - multi-player app with pictures and animation. Four activities - each includes words, carrier phrases and sentences. Choose initial, final, consonants, s clusters, liquids, medial, complex, multisyllabic words and many more primary or secondary targets. Data collection and customization.
<b>Judy Lynn</b> ( <a href="http://www.judylynn.com">www.judylynn.com</a> )	All Judy Lynn apps will also be available for Android through the Google Play Store and the Kindle Fire App store. All switch apps work with AbleNet Blue2, Pretorian Technologies interfaces, Tecla and RJ Cooper Bluetooth interfaces, as well as with Bluetooth wireless keyboards.
Sequencing Tasks Life Skills Bundle #1	A App focuses on arranging photos of a task in chronological sequence. There is video demonstration of a life skills task, a review of the task using three photos, then student is presented with the task of arranging the photos in sequential order by dragging & dropping them into a sequence. Record-keeping options. Seven tasks: brushing teeth, sweeping floor, scooping ice cream, eating a banana, buying soda from vending machine, getting in car, stapling papers together. Options to skip video model or review lesson. Excellent series of apps, based on the computer software programs.
Sequencing Tasks Life Skills Bundle #2	A Seven more sequences: washing hands, eating cereal, putting on a bandaid, eating cake, laundry, making a cheese sandwich and painting a picture.
Sequencing Tasks Life Skills Bundle #3	A Seven more sequences: putting on sneakers, eating a hamburger, throwing out the garbage, buying candy, making scrambled eggs, talking on the phone and eating potato chips.
Sequencing Tasks: Life Skills- Lite Version	A* Free version of above with one sequencing task to try. Great way to try out the program and view all the features.
Sorting Activities: Life Skills - 2 Choices	A Ten sorting activities – drag and drop the object into the appropriate container. Each activity has two containers and four objects to sort. Sort animals, clothes, food, furniture, snacks, vehicles and shapes.
Sorting Activities: Life Skills- 3 Choices	A Drag and drop the object into appropriate container – three containers and six objects to sort. Sort clothes, silverware, colors, fruit, hardware, recycling, rooms, shapes, colors, sporting equipment.



Sorting Activities: Life Skills- Lite Version	A*	Free version of Sorting Activities – three containers and six objects to sort.
Switch Accessible Mazes Beginner Level; Switch Accessible Mazes Intermediate Level; Switch Accessible Mazes Advanced Level	A	Mazes to help development of problem solving skills, logical thinking, deductive reasoning and spatial sense. Use touch, one switch with autoscan or two switches with step-scanning. Each app has 12 different mazes. Beginner: no decision points. Intermediate has one or two decision points per maze and advanced has many decision points. Work with AbleNet Blue2, RJ Cooper Switch interface, Pererro & Tecla.
Switch Accessible Mazes: Lite Version	A*	Lite (Free) version includes a maze from each of the above.
Kids Car Mazes- Level 1	A	Move a car through 12 different mazes with one or two decision points per maze. Move in four directions using icons with arrows pointing right, left, up, down.
Kids Car Mazes- Level 2	A	Twelve different mazes with many decision points per maze
Kids Car Mazes - Lite (Free) Version	A*	Contains two sample mazes from the full version.
Switch Accessible Matching- Bundles 1, 2, 3 & 4	A	This series of apps teaches matching skills within a context of a fun arcade-style game. An object appears in the middle position of the game and the user turns the wheels in the first and third positions until they all match. Each full version app contains a bundle of 10 different categories of matching activities (i.e., clothes, fruit, food, furniture, musical instruments, etc.) All the apps in this series can be accessed with two switches using step-scanning, with one switch with autoscan, or by touching the screen directly with your finger/stylus. Data is automatically saved.
Switch Accessible Matching- Lite Version	A*	This free app includes one switch-accessible matching activity – try it with your switch and switch interface.
Kids Matching Game- Bundle 1, 2, 3 & 4	A	This series of apps teaches matching skills within a context of a fun arcade-style game. An object appears in the middle position of the game and the user turns the wheels in the first and third positions until they all match. Each full version app contains a bundle of 10 different categories of matching activities.
Kids Matching Game - Lite Version	A*	Includes one matching activity – lets you try out the activity and explore the pictures and how it is played.
Switch Accessible Matching-Critical Thinking	A	In each activity, a graphic appears in the middle position of the game and student turn the wheels in the first and third positions until all match the middle. All Switch Accessible matching apps can be used with two-switch step scanning, one switch with autoscan or by touching the screen. Data is collected.
Switch Accessible Matching-Addition & Subtraction	A	In each activity, a number appears in the middle position. Users turn the wheels in the first and third positions until the simple addition or subtraction equals the number in the middle. All Switch Accessible matching apps can be used with two-switch step scanning, one switch with autoscan or by touching the screen. Data is collected.
Kids Matching Game-Critical Thinking	A	Similar to Switch Accessible Matching but with touch access only.
Kids Matching Game-Addition & Subtraction	A	Similar to Switch Accessible Matching but with touch access only.
<b>Laureate Learning</b> ( <a href="http://www.laureatelearning.com">www.laureatelearning.com</a> )		From the excellent Laureate Learning System publishers, research-based language learning with optimized intervention – software adjusts to student.
Laureate First Words		Build language and communication while learning 50 early nouns. Engaging animations teaches five words at a time, with individualized instructional support options; includes feedback, reinforcement, cueing, data collection, built-in reports, choice of background, optional text, choose session duration, response time, picture type (drawing or photograph). Five Training levels, pre- & post-test. Select specific vocabulary or let program determine needs. Excellent for children with autism, intellectual and developmental disabilities, language-learning disorders and hearing impairments. An upcoming update will include single switch and scanning options.
		NOTE: Laureate Learning has a excellent new computer software program titled Language for Theory of Mind 1: Understanding Others' Perceptions, Wants & Needs – full review to appear in the next DISKoveries.
<b>Oceanhouse</b> ( <a href="http://www.oceanhousemedia.com">www.oceanhousemedia.com</a> )		Great classic stories, professional narration, words are highlighted, autoplay mode too, or read page by page, now lets you record your own voice and share.
There's a Map on My Lap		Part of the Cat in the Hat's Learning Library – this app teaches all about maps – explore pictures and diagrams, learn new vocabulary words. Highlighted narration, record your own story, touch to get glossary definitions, two modes – read to me or read by myself.
Oh Say Can You Seed?		In this Cat in the Hat learning book, children learn all about plants, seeds and flowers, plus basic photosynthesis, pollination and seed dispersal. Designed for ages 5-10. Discover words through pictures, glossary definitions with a simple touch, interactive science diagrams – add your own narration, too.
	*	Oceanhouse has many free apps to try.
	A	Many Oceanhouse Media books are available in Android format through the Google Store

<b>Virtual Speech Center</b> ( <a href="http://www.virtualspeechcenter.com">www.virtualspeechcenter.com</a> )		
School of Multiple Step Directions		For ages 5-12, designed to improve auditory comprehension of multi-step directions within three classroom settings (English, Math, Chemistry) 2-, 3-, and 4-step unrelated directions with multiple levels of difficulty. Directions include things like underline, erase, cross out, touch, set the temperature, add water, etc. Stimuli include pictures, letters, shapes, number, size, color, concepts, bigger than, odd/even, etc. Can add competing noise for auditory figure-background, including control of type of noise and loudness. Record keeping, email results, auto-scoring. An excellent and comprehensive app.
Preposition Journey		Practice prepositions with three animals in three different animated scenes. Receptive and expressive tasks with prepositions such as in, on, under, next to, front, between, above/below, out, over, near/far and others. Select specific prepositions or work with all. Record keeping, email reports.
Auditory Workout	A	Virtual Speech Center's Auditory Workout App (previously reviewed in DISKoveries) is available in Android format through the Google store.
<b>Super Duper Publications</b> ( <a href="http://www.superduperinc.com">www.superduperinc.com</a> )		Excellent collections of "fun decks" (prompts are read aloud, select the cards you want to use or use them all, track responses for unlimited number of students) and other language apps.
Word FLiPS		Teach functional vocabulary (greetings, requests) while practicing up to three repetitions of sound sequences. Choose words according to articulatory placement, syllable structure. Audio of all syllables. Free play mode lets you flip through cards or randomly generate syllable combinations, record responses, track data.
Super Duper Idioms Pro		Make learning idioms a piece of cake! 500 common English idioms in four learning games with data tracking. Students pick the correct definition for a given idiom, pick the idiom that fits a definition, listen to questions and pick the correct idiom, listen to short story and pick the idiom that fits in the blank to complete the story, or locate the idiom in a short story. Pick from two to four different choices. Questions and answers can be read aloud if desired. Great app!
Super Duper Idioms	*	Try out the first 50 idioms from the full program, which contains 500 common English idioms.
Name That Around the Home Category! Fun Deck		56 illustrated picture cards – with audio – fill in the blank to practice categorizing, vocabulary and listening skills. Has statements like: "A broom, vacuum and mop are ....." Students respond with the answer, manual scoring is available.
Synonyms Photo Fun Deck		56 cards – fill in the blank to practice and learn words with similar meanings. Has statements like "She is feeling sick." Pick one of two answers to pick the synonym. Immediate feedback. Select "open ended responses" from options menu and students can give their own synonyms.
Comprehending Negation in Sentences Fun Deck		56 cards – students are presented with statements and pictures, such as "The monkey is .... " or "The fork is not ...." Pick the correct word that matches the picture or use in open ended mode to have the students give their own answer.
What Would You Do in the Community if? Fun Deck		Prompts include questions like "What would you do if...someone cut in front of you in the checkout line? Student give a verbal response and the answers are scored manually. 56 colorful, illustrated cards.
Pronoun Fill-in Sentence Cards Fun Deck		120 picture flash cards with audio to learn the proper use of subjective, objective, possessive and reflexive pronouns. Choose from one of two answers with automatic scoring or use open ended response option and manual scoring.
"WH" Questions in the Community Fun Deck		56 picture cards with questions like "Why do you go to the dentist?" and "Who works at the fire station?" Questions can be read or will read aloud with a simple touch. Open ended with manual scoring.
Difficult Situations Fun Deck		56 cards, each with a a picture that will help discuss and teach about safety, and feelings and emotions related to the different situations. Topics included, for example, are: "Your friend keeps teasing you while you are trying to study."
Imagination Questions Fun Deck		56 more illustrated cards that can be used to help encourage writing, storytelling, describing and thinking skills. The prompts include things like: "You found a money tree...what would you do with the money?" and "You won a free trip to anywhere in the world... Where do you want to go?"
Adjectives Fun Deck		Great way to improve grammar, syntax and vocabulary skills – fill in the blank with the correct adjective. Select from two choices or use open ended mode to have students think of their own answer.
Hearbuilder Following Directions	*	This app presents a free tour of the first level of all the activities in the full version. This is an award-winning, evidence-based software program now available for the iPad. Great for improving listening skills and ability to follow increasingly difficult directions, including 40 basic concepts in five areas: Basic, Sequential, Quantitative/Spatial, Temporal and Conditional. Fun game format, monitors progress and provides feedback. Can add background noise at all levels.
Hearbuilder Phonological Awareness	*	Another excellent Hearbuilder app. This one to improve phonological awareness and listening skills. Targets 9 phonological awareness skills. Activities gradually increase in difficulty, monitors progress and provides feedback.
Hearbuilder Sequencing	*	A free tour of the first level of all the activities in the award winning software program.
Kangaroo Island Photo Classifying		Users learn to name and classify 336 items into 15 categories. Six interactive fun activities, work on one to five categories at a time, classify using photos or text. Track unlimited number of users, email/print and share results.

Caveman Time Machine- Basic Concepts		Children take a time machine to Ancient Egypt, the Old West and the Future to learn same concepts in different contexts. 54 basic concepts of colors, descriptive words, location words and more. Explore and then take Concept Quizzes to verify learning. Five animated scenes in each of the time periods. Print/email results.
	A	Many Super Duper apps are available in Android format, through the Google Store.
<b>Tactus Therapy</b> ( <a href="http://www.tactustherapy.com">www.tactustherapy.com</a> )		
Question TherAppy		Excellent series of programs for learning to ask and answer questions, for users of all ages and levels!!! Record features, data stored, email with summaries. Both Asking TherAppy and Answering TherAppy in one app.
Question TherAppy Lite	*	Free app lets you see the range of activities and modes in both Asking and Answering TherAppy.
Asking TherAppy		Targets the goal of learning to ask yes/no and WH questions. Four activities and three modes of response for both guided learning and independent question asking. Different levels of support are offered to help user understand the process of asking the question. Investigate lets users see how asking questions gets them information; Yes/No and WH Questions activities provide practice in asking questions to request or clarify; Question Spinner is a fun activity for guided practice asking questions. Answer modes provide varying degrees of support in formulating questions.
Answering TherAppy		Developed to practice understanding and answering questions, over 400 questions, 7 levels of yes/no and 9 categories of WH questions. Customize all. Receptive and expressive response modes. Can record responses.
Visual Attention TherAppy		Designed to improve reading, scanning, concentration, memory, attention to detail, neglect, speed of processing. Timed activities to find letters and symbols in a field of adjustable size. Systematic and customizable practice to train eyes and brain. Test and practice modes. Twelve settings of spacing/size - can also adjust for low-vision users. Turn on/off a bright signal at the edge of screen to draw attention to the neglected side of space.
Visual Attention TherAppy Lite	*	Free app to see activities and options in Visual Attention TherAppy.
Speech FlipBook Standard		Quick access to nearly every single-syllable word in the English language. Pick which sound you want in initial, medial & final positions; flip between sounds or words to create the targets you want; hear the sound & words or record yourself and play it back instantly. Thousands of real words; 250 sets of homophones. Users can see the different spellings that go with each sound. Outstanding!
Speech FlipBook	*	Lite (free) version
<b>Hamaguchi Apps</b> ( <a href="http://www.hamaguchiapps.com">www.hamaguchiapps.com</a> )		Excellent, well designed language learning apps!!
Fun with Verbs		Interactive app to learn receptive and expressive present and past tense action words in sentences. Visually sequence the parts of a sentence to help children understand syntax. Choose sentence types (verb only, subject+verb, and other more complex forms). 39 verbs, present ing form, past regular or past irregular. Cueing option. Reinforcer game optional. Text and recoding options can be on/off. Data tracking.
Fun With Verbs Lite	*	Single user, three verbs for each sentence structure, 45 animations.
<b>LIFETool Solutions</b> ( <a href="http://www.lifetool.at">www.lifetool.at</a> )		Great collection of cause & effect, beginning switch training or touch training apps for young children.
Switch Trainer		Excellent app to train one- or two-switch scanning – six different activities, with multiple levels. Users press their switch to select from two or three choices. Fun animation and sounds. Some activities have scanning box, others have a character moving from one activity to the other. Options include ability to simplify visual presentation, display prompts, switch or touch screen selection, control over scanning speed and more. Comprehensive manual available within app.
Switch Trainer Lite	*	Lite (free) version shows one of six games - can fully test the different modes and settings.
TouchMe Hokus Pokus		Cause & effect picture-build app – press switch or touch to build the picture – 30 different pictures with three different levels of difficulty.
TouchMe UnColor		Cause & effect touch skill training. Users swipe all over the screen to uncover the picture. 17 different animations.
TouchMe PuzzleKlick		A cause & effect puzzle game for switch or touch. Each press will uncover one part of a hidden picture. 25 pictures and sounds. Options let you decide how many presses (2, 4, 6, 9 or 12) to reveal picture. Uncolor Pro and PuzzleKlick Pro will both have an editor to insert your own pictures, sounds and videos - watch for update in early 2014.

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# Is it Possible?

## Accessible and Affordable Digital Tools for Students With Special Needs

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Technology resources that can improve learning experiences of students with disabilities change so rapidly that it's tough for educators to keep up. There are seemingly limitless resources available – including websites, apps and special software to address the needs of diverse learners. Some are quite costly, but some are very affordable and often free. For example, many educators are not aware of the depth of accessibility features available in mobile devices. The new features available within iOS7 and Android-based devices have great potential for improving how students access curriculum without incurring addition cost for special software or apps.

In considering the use of mobile technology in special education, it might be helpful to review some basic terminologies. IDEA is the federal law supporting persons with disabilities (<http://idea.ed.gov/explore/home>). By law, mobile devices must include accessibility features that enable users to access

programs and communicate regardless of disability (IDEA, 2007). Assistive technology (AT) is an umbrella term that encompasses any technology device, program, website or other resource that enables students with special needs to have fair and appropriate access to curriculum and learning of content. Augmentative and alternative communication (AAC) technologies are specific devices that improve levels of independence, interaction, behavior and learning. These technologies are most often used for students with moderate to severe disabilities.

Mobile devices are becoming powerful solutions to address assistive technology needs in special education settings. Using mobile devices, students with disabilities are able to access curriculum that is formatted specifically to bridge gaps between disability and content. Accessibility tools can be found within the General settings of any device. Among the most powerful are screen readers,

zoom, changing background color, text-to-speech, speech-to-text, closed captioning, connecting Braille keyboards via Bluetooth and even the capability to access all content on a device via a switch. Until very recently, AAC device options were expensive and bulky. The release of accessibility features on mobile devices has changed this. Accessibility features, such as Braille input and switch access, enable students to use mobile devices as AAC at a relatively low cost. In addition to the accessibility tools that are available in mobile devices, hundreds of free and low cost apps designed to address learning deficits and inability to access content are being developed and released on a monthly basis. Websites, such as Moms with Apps (<http://momswithapps.com/apps-for-special-needs/>), Bridging Apps (<http://bridgingapps.org/>) and Apps for Stages (<http://apps4stages.wikispaces.com/>), offer a wealth of free information and resources for parents and educators.



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## Matrix of Reading / Writing Task and Appropriate Assistive Technology Tools ©JCourduff (2011)

Curriculum tasks	Design strategies	Hardware	Tools / software
<p>Reading</p>	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum (CAST)</p>	<p>MS Office™ program</p> <p>AlphaSmarts™</p> <p>Fusion Writers™</p> <p>iPod / iPod touch™</p> <p>PDA / handhelds</p> <p>Interactive whiteboard</p> <p>Interactive dance mats (i.e. RM EasyTeach DanceMats™)</p> <p>Student Response systems</p> <p>AAC devices</p>	<p>Text to speech (screen readers)</p> <p>Word recognition</p> <p>Hypertext</p> <p>Animated graphics</p> <p>Video</p> <p>Supported digital texts</p> <p>Digitized speech</p> <p>Online tutorial programs (i.e. Study Island™, Rosetta Stone™)</p> <p>ClickIt™</p> <p>Typing software</p> <p>Intellitalk™</p> <p>Speech-to-text (i.e. WordQ™/SpeakQ™)</p> <p>Graphic organizers (i.e. Inspiration™ / Kidspiration™)</p> <p><b>Accessibility websites</b></p> <p><a href="http://www.bookshare.org">www.bookshare.org</a></p> <p><a href="http://www.sheppardsoftware.com">www.sheppardsoftware.com</a></p> <p>Tutorial development (i.e. Jing™)</p> <p>Start-to-finish books</p> <p>iPod touch/iPad Apps</p>
<p>Writing</p>	<p>Mainstream design:</p> <p>Visibility: user can determine options for advancing learning on a device intuitively</p> <p>Conceptual model: device offers consistency of operations and feedback</p> <p>Mapping: user can determine relationships between actions / results; controls / effects; what is visible / what is available on the system</p> <p>Feedback: user receives full continuous feedback</p>	<p>MS Office™ programs</p> <p>AlphaSmarts™</p> <p>Fusion Writers™</p> <p>iPod / iPod touch</p> <p>PDA / handhelds</p> <p>Interactive whiteboard</p> <p>RM EasyTeach DanceMats™</p> <p>Student Response systems</p> <p>Digital camera</p> <p>Microphone</p>	<p>Scaffolding</p> <p>Concept mapping / graphic organizers</p> <p>Typing tutorials</p> <p>Spell check/Custom vocabulary/Thesaurus</p> <p>Voice recognition</p> <p>Graphics / picture support</p> <p>Word prediction/Word counts</p> <p>Auto summarize</p> <p>writing statistical analysis, Kincaid score, Frequency lists</p> <p>Co-Writer™ /Write OutLoud™</p> <p>Study Island™</p> <p>Typing software</p> <p>Intellitalk™</p> <p>WordQ™/SpeakQ™</p> <p>iPod touch/iPad Apps</p> <p>Accessibility websites–</p> <p><a href="http://www.readwritethink.org">www.readwritethink.org</a></p> <p><a href="http://www.iknowthat.org">www.iknowthat.org</a></p> <p><a href="http://www.spellingcity.com">www.spellingcity.com</a></p>

As learning becomes more mobilized, we need to rethink instructional practice to align with the new learning structure. This includes the integration of real-life experience into daily instruction and a team approach to supporting and enabling teachers. There are several barriers to deep integration of technology, including (a) lack of time to learn to use and integrate new or existing tools, (b) lack of adequate infrastructure and technology resources, (c) the belief that the technology will not impact student learning, (d) lack of site-level administrative support, (e) lack of training for teachers and administrators in identifying appropriate technology resources on the IEP, and (f) lack of ongoing support in the integration and management of technology and the use of mobile devices at the classroom level. There is hope, however. When the use of technology to support learning is developed by a team, great things can happen. Teams should include the general and special education teachers, students, parents, administrators and member of district or site level IT departments. When appropriate technology resources are considered using a team approach, there is a much higher probability of successful integration in the classroom and at home. Knowledge sharing is power.

The tables below include two matrices. The first one aligns curriculum tasks with technology tools that are commonly found in classrooms. The second one is more specifically aligned to meet the learning needs of students who require speech-language pathologist support. The majority of the apps listed in both matrices are either free or low-cost. Keep in mind as you look over the tables that the cost on apps changes weekly, if not daily. In addition to the tables below, there is a google doc with a much more comprehensive list of apps and website resources that can be used for learning. Here is the link to this shared document that includes apps, websites, research, and other resources for special and general education learning support. (<https://docs.google.com/spreadsheet/cc?key=0Ahd0ygNQqIK7dFFpZUNUQVpJWVhHSHN2WG8wZExtTIE&usp=sharing>). This document includes prices for the apps that are listed in the matrices

# Matrix of Math / Social Science Task and Appropriate Assistive Technology Tools

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Curriculum tasks	Design strategies	Hardware	Tools / software
Math	<p>Mainstream design:</p> <p>Visibility: user can determine options for advancing learning on a device intuitively</p> <p>Conceptual model: device offers consistency of operations and feedback</p> <p>Mapping: user can determine relationships between actions / results; controls / effects; what is visible / what is available on the system</p> <p>Feedback: user receive</p>	<p>MS Office™ programs</p> <p>Fusion Writers™</p> <p>iPod / iPod touch™</p> <p>PDA / handhelds</p> <p>Interactive whiteboard</p> <p>RM EasyTeach DanceMats™</p> <p>Student Response systems</p>	<p>Spreadsheets / Databases</p> <p>Graphing calculators</p> <p>Gaming software</p> <p>Tutorial software</p> <p>Contextualized math word problems through web-based learning environments</p> <p><b>math websites:</b></p> <p>Study Island™</p> <p>iPod touch™ / iPad™ Apps</p>
Social Studies	<p>Mainstream design:</p> <p>Visibility: user can determine options for advancing learning on a device intuitively</p> <p>Conceptual model: device offers consistency of operations and feedback</p> <p>Mapping: user can determine relationships between actions / results; controls / effects; what is visible / what is available on the system</p> <p>Feedback: user receives full continuous feedback</p>	<p>MS Office™ programs</p> <p>iPod™ / iPod™ touch</p> <p>Interactive whiteboards</p> <p>Digital camera</p> <p>Microphone</p>	<p>Supported digital texts</p> <p>Presentation tools</p> <p>Spreadsheets / databases</p> <p>Virtual field trips</p> <p>Virtual reality websites</p> <p>Concept mapping / graphic organizers</p> <p>Research tutorials</p> <p>Screen readers</p> <p>Text-to-speech</p> <p>Interactive simulation games (Oregon Trail™)</p> <p>Inspiration™ / Kidspiration™</p> <p>iPod touch™ / iPad™ Apps</p> <p><b>social studies websites</b></p> <p><a href="http://www.besthistorysites.net">www.besthistorysites.net</a></p> <p><a href="http://www.bensguide.gpo.org">www.bensguide.gpo.org</a></p> <p><a href="http://www.pbs.org/history">www.pbs.org/history</a></p>
Science	<p>Three-dimensional learning environments</p> <p>Experiential learning</p> <p>Social skills</p>	<p>High end computer system</p> <p>Interaction in both simulated and real worlds</p> <p>Digital camera</p> <p>Microphone</p>	<p>Virtual reality games</p> <p>Screen readers</p> <p>Text-to-speech</p> <p>PDAs</p> <p>iPod™ touch / iPad™ Apps</p> <p>Websites</p> <p><a href="http://www.enabling.org/grassroots">www.enabling.org/grassroots</a></p>
Social Skills	<p>Three-dimensional learning environments</p> <p>Experiential learning</p> <p>Social skills</p>	<p>MS Office™ programs</p> <p>Digital camera</p> <p>Microphone</p>	<p>Social stories</p> <p>Multi-user Domain, Object Oriented (MOO) / Multi User Domain (MUD)</p> <p>Social Skills websites</p>

When integrated into learning activities, technology resources, including mobile devices, provide multisensory, interdisciplinary tools for all learners. Accessibility features found in mobile technology can be personalized to meet diverse learners' needs without a heavy impact on school budgets. These resources have the power to enable learning that is community-driven, creative and innovative while providing a level playing field where all

learners can develop the necessary skills to thrive in a digital world.

## RESOURCES SUPPORTING ASSISTIVE TECHNOLOGY AND MOBILE LEARNING:

CAST (Center for Applied Special Technology) <http://www.cast.org/>

ISTE SETsig (International Society of Technology in Education Special Educa-

tion Special Interest Group) <http://setsig.iste.wikispaces.net/>

ISTE SigML subcommittee on Special Education <http://sigml.iste.wikispaces.net/SpecialEducation>

QIAT: Quality Indicators for Assistive Technology listserv [http://natri.uky.edu/assoc\\_projects/qiat/](http://natri.uky.edu/assoc_projects/qiat/)



# Speech Language Pathologist Task / Tools Matrix

## Language Tasks and Technology Tools ©JCourduff (2012)

Learning goals	Design strategies	Hardware	Tools: Apps
AAC	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum tasks (CAST)</p> <p>SETTs framework (Zabala, 2004)</p> <p>(student – environment – task – tool)</p> <p>Mainstream design:</p> <p>Visibility: user can determine options for advancing learning on a device intuitively</p> <p>Conceptual model: device offers consistency of operations and feedback</p> <p>Mapping: user can determine relationships between actions / results; controls / effects; what is visible / what is available on the system</p>	<p>iPads</p> <p>iPod touch</p> <p>NintendoDX™</p> <p>Dynavox™</p>	<p>Apps</p> <p>iCommunicate™</p> <p>Write&amp;Say™</p> <p>Touch Chat Suite™</p> <p>VAST Autism 1 Core™</p> <p>Predictable™</p> <p>Assistive Chat™</p> <p>Talk4Me™</p> <p>Sydspeak™</p> <p>SpeechTree™</p> <p>Tap to Talk™</p> <p>My Choice Board™</p> <p>Prologuo2Go™</p> <p>TapSpeakChoice™</p> <p>Sounding Board™</p>
Articulation	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum tasks (CAST)</p> <p>SETTs framework (Zabala, 2004)</p> <p>(student – environment – task – tool)</p>	<p>iPads</p> <p>iPod touch</p> <p>AAC devices</p> <p>MS office programs</p> <p>Digital camera</p> <p>Computer microphone</p>	<p>Apps</p> <p>Sunny Articulation Test™</p> <p>The R App™</p> <p>Speech Tutor™</p> <p>Pocket Pairs™</p> <p>Voice Changer Plus™</p>
Emotions	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum tasks (CAST)</p> <p>SETTs framework</p> <p>(student – environment – task – tool)</p>	<p>iPads</p> <p>iPod touch</p> <p>AAC devices</p> <p>MS office programs</p> <p>Digital camera</p> <p>Computer microphone</p>	<p>Apps</p> <p>DPS Digital Problem Solver™</p> <p>Feel Electric™</p>
Expressive / Receptive language	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum tasks (CAST)</p> <p>SETTs framework</p> <p>(student – environment – task – tool)</p>	<p>iPads</p> <p>iPod touch</p> <p>AAC devices</p> <p>MS office programs</p> <p>Digital camera</p> <p>Computer microphone</p>	<p>Apps</p> <p>iMovie™</p> <p>Dragon Speaking Naturally™</p> <p>Talking Tom™</p> <p>Quick Voice™</p> <p>Shout Out™</p> <p>Songify™</p>
Social / Pragmatics	<p>Universal design for learning (ULD)–cognitive rescaling</p> <p>Universal access: Architecture vs. curriculum tasks (CAST)</p> <p>SETTs framework</p> <p>(student – environment – task – tool)</p>	<p>iPads</p> <p>iPod touch</p> <p>AAC devices</p> <p>MS office programs</p> <p>Digital camera</p> <p>Computer microphone</p>	<p>Apps</p> <p>Visual Schedule Planner™</p> <p>First – Then Planner™</p> <p>The Social Express™</p>

# What is Video Modeling?

The use of visuals with young children with autism spectrum disorders (ASD) is a well-established and commonly used strategy. Video modeling takes the use of visuals to the next level by combining a conventional strategy with newer technologies to create an even more effective teaching tool. Video modeling allows children to learn new skills by watching concrete and predictable videos in minimally distracting environments, as opposed to learning through interactions with abstract and ever-changing people in more dynamic environments. Plus, what child doesn't enjoy watching videos? These personalized videos highlight specific behaviors that you want the child (i.e., your student, client or child) to exhibit while demonstrating a specific skill or completing a specific routine. Video modeling allows the child to learn expected behaviors quickly, which allows him to demonstrate skills and complete routines with less hands-on adult support.

Video modeling is not a new teaching strategy. In fact, the use of video modeling to increase the skills of individuals with special needs is supported by a considerable amount of research. We have been using various types of video modeling to support the development of young children with ASD over the past several years and have observed incredible success with children across ages. One of the greatest benefits of video modeling that we have observed is the speed with which children are able to acquire new skills.

In this article, we review the three types of video modeling addressed in our book, *Video Modeling for Young Children with Autism Spectrum Disorders: A Practical Guide for Parents and Professionals* (Murray and Noland, 2013). In addition to describing each method of video modeling, we share real-life examples of how we have used video modeling to facilitate the development of children with ASD. While the majority of our video modeling experience is with young children, the techniques described in this article will be just as useful to those who work with older children and adolescents. And, the strategies are so simple that anyone can do it!

## BASIC VIDEO MODELING

Basic Video Modeling (BVM) is a teaching strategy in which the learner watches a video of an actor, other than himself, appropriately demonstrating a specific skill or routine. The goal of BVM is to target a change in a learner's behavior that will increase his ability to successfully demonstrate a skill or routine. BVM can be used to teach a variety of skills across all areas of development. BVM is particularly effective at increasing a learner's ability to remain calm during stressful activities, such as transitions, dental exams, haircuts and doctor visits. Watching a video of an unfamiliar event inevitably makes the event more familiar, less scary and, therefore, less stressful. We have also found BVM to be particularly effective at increasing independence within daily routines (e.g., washing hands, dressing,

cleaning up toys). One of the benefits of BVM is that you can use actors that are already capable of performing the skill or routine independently. This means little to no editing is needed!

As we mentioned earlier, the use of video modeling to teach individuals with ASD is supported by a sizeable amount of research. In a study completed by Charlop-Christy and Freeman (2000), the effectiveness of using BVM to teach developmental skills to young children with ASD was compared to the effectiveness of using In Vivo modeling to teach these same skills. In Vivo modeling is defined as the learner observing a live model performing the target behavior. The results suggest that BVM leads to faster acquisition of skills than In Vivo modeling and effectively promotes generalization (i.e., the demonstration of the targeted skill in different settings or with different materials). The researchers suggest that the results may be due to the motivating and attention maintaining qualities of videos.

## BASIC VIDEO MODELING CASE STUDY

Greta, a two-and-a-half-year-old girl with a medical diagnosis of ASD, was receiving weekly in-home services through her local school district. She loved to swim in her neighborhood pool, which prompted her parents to enroll her in a parent-child swimming class. Greta was familiar with the swimming school where the lessons were held and she had all of the prerequisite skills needed for this type of class

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(follows simple directions, uses words to make requests, enjoys interacting with others, etc.). Greta's parents intentionally prepared Greta for her first class by using some of the swimming school's terminology during Greta's baths, engaging in frequent discussions about the things that would happen at swim school and observing her sister's swimming class. However, on the first day of class, Greta began crying as soon as they entered the pool. After several failed attempts to calm her down, Greta and her mother got out of the pool. The following week was not any better.

A BVM video was made to increase Greta's enjoyment during swimming lessons. Greta's mother used her smartphone to record a few short clips of Greta's older sister at the swimming school, including one of her getting into the pool, one of her having fun in the pool and one of her getting out of the pool. In order to eliminate the need for editing, Greta's mother had been asked to say three different phrases into the camera while filming specific behaviors. As Greta's sister stepped into the pool, her mother said, "Time for swimming." While Greta's sister was swimming, her mother said, "Swimming is fun!" As Greta's sister stepped out of the pool, her mother said, "All done swimming." The combined length of the three videos was less than two minutes.

Using her smartphone, Greta's mother showed Greta the three video clips in succession without interruption (i.e. the first video was shown, immediately followed by the second and then the third) every day for almost one week. On the day of her next swimming lesson, Greta watched these videos in the car before heading into the swim school. During her third lesson, Greta calmly entered the pool and remained calm for the majority of the lesson.

## **VIDEO SELF-MODELING**

Video Self-Modeling (VSM) differs from Basic Video Modeling (BVM) in one fundamental way: the main actor in a VSM video is always the learner himself. While BVM involves the learner watching a video of another person demonstrating a skill, VSM involves the learner watching a video of himself successfully demonstrating the target skill or routine. Watching a

video of oneself appropriately demonstrating the expected behaviors not only teaches the learner what he needs to do, it also increases his confidence in his own ability to do it! The learner is then able to imitate these self-modeled behaviors to successfully demonstrate the targeted skill. VSM videos can be used to teach a wide-variety of new skills. They are also effective at increasing the frequency of a behavior that is demonstrated infrequently, as well as shaping and refining existing behaviors.

It may seem difficult to create a video that depicts a child successfully doing something that they aren't able to do; however, with creative filming and editing, it can be done! To create a VSM video, the learner is recorded completing a skill or routine from start to finish or in smaller segments. The raw footage is then edited to remove any adult prompting that the learner needed to complete the routine and to remove any off-task behaviors. You may find that the act of being filmed is motivating enough to help the child remain on-task while recording the raw footage (the "movie star" effect). Background music or voice-over narration can be added, as well as verbal praise at the end of the video, such as, "Great job brushing your teeth!" The learner will be amazed as he watches a video of himself being so successful!

## **VIDEO SELF-MODELING CASE STUDY**

Ahmad, a four-and-a-half-year-old boy with ASD, received all of his special education services within an inclusive preschool classroom. He was highly verbal, participated in group-learning activities and engaged in a variety of activities throughout the classroom. Although Ahmad responded to his peers' initiations, he rarely initiated conversations or play with his classmates. And, when he did ask a friend to play, he used a very quiet voice, making it difficult for his classmates to hear him within the noisy classroom.

A VSM video was created to increase Ahmad's ability to initiate play interactions with his peers more frequently, using a louder voice. Prior to filming the video, Ahmad and his teacher engaged in role playing to familiarize Ahmad with the necessary sequence of behaviors.

During the filming process, the teacher's aide provided Ahmad with visual and verbal prompts as needed, while Ahmad asked friends to play. The finished video illustrated the following sequence: 1) Ahmad asking his friend Josie to paint at the easel; 2) Josie's response; 3) Ahmad and Josie walking toward the easel; 4) Ahmad and Josie painting; 5) Ahmad asking his friend Will to play in the kitchen; 6) Will's response; 7) Ahmad and Will walking toward the kitchen; 8) Ahmad and Will playing in the kitchen; 9) Ahmad asking his friend Peter to play with cars; 10) Peter's response; 11) Ahmad and Peter walking toward the cars; and 12) Ahmad and Peter playing with cars. All adult prompts were muted and voice-over narration was added at the end of the video to serve as verbal praise ("Good job using a big voice to ask friends to play, Ahmad!"). The final video was two minutes long.

Prior to play time each day, Ahmad watched the video on an iPad in a quiet corner of his classroom. After the first viewing, Ahmad needed help choosing a friend to approach. His teacher asked him who he wanted to play with, what he wanted to do with them and reminded him to just walk over and use a "big voice." He did a great job! After watching the video every school day for two weeks (eight total viewings), the video was faded from use. Ahmad was independently approaching his peers and consistently speaking loudly enough to be heard.

## **POINT-OF-VIEW VIDEO MODELING**

Point-of-view Video Modeling (PVM) is similar to Basic Video Modeling in that it involves recording a person other than the learner engaging in the specific skill or routine. The one thing that sets this strategy apart from the rest (and ultimately gives it its name) is that the recording captures exactly what the learner will see through his own eyes while demonstrating the skill or routine. It is easiest to gain this perspective if the camera is held beside the actor's face and pointed in the direction of the actor's eye gaze. Given that the recording illustrates the targeted skill from the learner's point-of-view, the video typically only includes the model's hands (e.g., demonstrating how to play



with a specific toy), as well as any social partners that are necessary for the skill or routine to be demonstrated (as needed in a video targeting appropriate greetings). PVM videos are an effective way to teach any new skill that the learner is not yet able to demonstrate because the learner is not the one performing the skill in the video. These videos are also a good way to teach social interaction skills that require eye gaze in a certain direction, such as the child's ability to respond to his name being called.

There are many advantages of PVM. First, it is almost always possible to record this type of video from start to finish in one errorless take, which means no editing! This substantially reduces the amount of time and effort that goes into making the video and allows you to start using the strategy immediately. Secondly, PVM allows the learner to watch and learn without needing to understand that people have different perspectives, which can be challenging for children with ASD. Because this type of video captures only what the learner will actually see through his own eyes, it is also easy to control the number of distractions within the video. This eliminates the learner's need to discern what information is important and what is not, which can also be challenging for learners with ASD.

## POINT-OF-VIEW VIDEO MODELING CASE STUDY

Brooks qualified for early intervention services under the educational category of ASD when he was 21 months old and immediately began learning through video modeling. Along with his delayed language skills, Brooks' parents had concerns regarding his ability to play with toys. While Brooks enjoyed playing, his impulsivity made it difficult for him to play appropriately with toys for longer than a minute or two. Even when provided with adult support, Brooks had a tendency to dump out the toys, hoard them close to his body, repeat the same basic play action over and over again and/or throw the toys.

A PVM video was created to target Brooks' ability to play functionally with one set of materials (cars and blocks)

over an extended period of time. In the video, the following play strategies were modeled: 1) building a road and pushing the cars on the road; 2) building a tunnel and pushing the cars through the tunnel; and 3) building a garage and parking the cars inside. During the video, the actor used simple two and three word phrases. The video began with the actor saying, "Time to play with cars," and then taking the materials out of a plastic tub. The video ended with the actor saying, "All done cars," and then placing the materials back into the plastic tub while singing a clean-up song. No editing was required.

After only one week of watching the video (one viewing each day), Brooks' mother reported a variety of positive changes. She shared that she could now sit back and follow Brooks' lead during play because he was spontaneously demonstrating the play strategies that were modeled in the video. This increase in functional and varied play had a positive effect on his ability to maintain his attention toward the toys. Brooks' mother also reported that while he often wandered away from the toys after a few minutes, it was easy to reengage him in play by modeling the targeted play strategies. An added benefit of this video was an increase in Brooks' expressive language. While the video was not made to target this skill, Brooks' mother reported that he started using many of the two-word phrases that were used in the video!

For more detailed information regarding the use of video modeling, please refer to *Video Modeling for Young Children with Autism Spectrum Disorders: A Practical Guide for Parents and Professionals* by Brenna Noland and Sarah Murray. This book can be purchased online directly from the publisher ([www.jkp.com](http://www.jkp.com)), through 3B's Therapy ([www.3bstherapy.com](http://www.3bstherapy.com)) or through most online book stores (The Autism Shop, Barnes and Noble, Amazon, etc.). ■

## SIMPLE STEPS TO USING VIDEO MODELING

- Step 1: Identify a skill or routine that you would like to target.
- Step 2: Identify and assemble the materials needed. The basic materials include a camera, a person to operate the camera (or a tripod), actor(s), materials required for the completion of the routine and equipment for video playback. Editing software might also be needed.
- Step 3: Complete a task analysis of the skill or routine and collect baseline data. Once you've deconstructed the skill or routine into its smallest steps, observe the child to see what he can already do on his own.
- Step 4: Make a plan for the filming. We suggest that you write an outline and script that includes everything the actor(s) will do and say in the video from start to finish.
- Step 5: Record the video.
- Step 6: Edit the video footage. This step is most important when creating a VSM video because you will most likely need to edit out unwanted elements of the raw footage, including adult prompts, off-task behaviors, etc.
- Step 7: Show the video to the child. The child should be allowed to watch the video from start to finish without any interruptions. Remember, one reason why video modeling is such an effective teaching tool for children with ASD is the fact that no social demands are being placed on the child.
- Step 8: Facilitate skill development following the viewing of the video. We do not recommend using video modeling as a stand-alone intervention, meaning you should still provide the child with support as he learns to demonstrate the new skill.
- Step 9: Monitor the child's progress.
- Step 10: Problem-solve if progress is slow. Some possible changes that might increase the child's progress include more frequent viewings, a different viewing location, a different type of video modeling video, a shorter video, etc.

# Assistive Technology: How we do Business in a Rural Setting

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Western Dubuque Community School District (WDCSD) is the largest geographic school district in Iowa, which presents its share of challenges. Distance between centers, busing expenses and differences in community personalities all lend unique perspectives when developing our curriculum and considering the needs of our students. However, while we have those challenges, they also provide many benefits that help us be a successful and vibrant district.

As a district, we focus on continuous improvement. We have learned that teamwork and collaboration, coupled with a clear definition of roles, helps us meet student and staff needs. Communication, both written and verbal, has helped us align our programs and get technologies in the hands of our students and staff, thus improving student outcomes.

WDCSD consists of nine rural educational centers, educates approximately 3,000 students and employs approximately 250 teachers. There are approximately 40 special education teachers. Our teachers are receptive to experimenting with new educational approaches and enjoy learning about new technologies.

We were excited when we were invited to present at the 2013 Closing the Gap Conference. Our presentation was entitled, Assistive Technology: How We Do Business in a Rural Setting. Often-times, when people think of Iowa, they think of nothing

but farmland, a slow-paced lifestyle and things being done “like they were done fifty years ago.” While there is a lot of farmland, this stereotype couldn’t be further from the truth.

Our school district has been innovative and forward-thinking, which has enabled us to embrace assistive technology and instructional technology. We are large enough to represent diverse cultures but small enough to move quickly when needed. Our students and staff all benefit from our pursuit of empowering students through creative technology use and applications. We have learned that we don’t need to spend a lot of money to see positive results. We tend to be conservative with our technology purchases, but we use our purchased technologies in ways that push their expected use in new and exciting ways.

The American Studies Departments at our high schools are an example of pushing our technologies beyond their intended use. They have created their own electronic textbook, have made it available at school and at home for all students and cover their content during class through the use of Surface RT tablets. Students can adjust visual settings for their individual needs, as well as work at a pace that is comfortable for them. Specialized electronic texts have been created for students because the course has been created for students. The text has been converted to address

students with reading needs through the use of a dyslexic font. Background and text color have been changed for students who need a variety of contrast to assist in reading.

Our Director of Student Services, Tina Brestrup, invites new ideas and learning methods for all special education students. She leads meetings with selected special education teachers who serve on our Assistive Technology Committee and provides learning opportunities for assistive technology growth. She welcomes feedback and innovation from the special education teachers, which has led to a tremendous increase in our special needs students’ educational growth. As a result of this openness to innovative thinking, teachers use iPads and computers to promote reading and writing growth, job-skills development, creativity and an improvement in communication skills. Apps, like Read2Go, Proloquo2Go, Dragon Naturally Speaking, Don Johnston apps and apps created internally for specific students, have led to higher test scores and, more importantly, better educated students.

We are fortunate to have Barb Pline as our Keystone Area Education Agency Special Education Consultant and Assistive Technology Representative. Since other school districts are not quickly available to physically visit due to distance, Barb educates us on trends, our strengths and weaknesses, laws, new innovations and offers support



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Consultant and  
Assistive Technology  
Representative.

for our special education students and staff. Barb supports our use of assistive technologies and is a resource to us. She assists with various AT options, such as Bookshare (Read2Go), and offers advice for students with a variety of disabilities. She helps educate teachers in the classroom so they continue to be high quality educators and serve the needs of every student. Barb is a fixture of our special needs professional development sessions and never hesitates to lead discussions and promote innovation. Every district needs a “Barb” who is passionate about student success.

I am the Teaching and Learning Technology Specialist for the district. I assist teachers with any educational technology idea or concern they have. I work one-on-one with every teacher in the district and provide ideas that will enhance the curriculum through technology tools. I have noticed a leap in technology integration with special education students when teachers are shown that technologies and software can also be used in ways they were not intended to be used. Some examples include using Microsoft Word for graphic design, creating videos for research projects or using a tennis ball to hold a marker for a student who has difficulties holding a marker. I release monthly newsletters and daily technology tips to assist teachers with ideas on technology integration and use.

Besides the American Studies Departments creating their own electronic textbook, we utilize other assistive technologies to educate the staff and students:

Symbaloo (<http://www.symbaloo.com/mix/technologyinstruction>) is used as an organizational electronic library for teachers and students to access information about technology use. Symbaloo provides a visual perception of the organizational process.

Teachers teach other teachers through informal videos (<https://www.smores.com/jta4>) that emphasize innovation and successful classroom experiences. These videos have showcased special education teachers whose ideas are then duplicated by general education teachers. These videos have been very successful and have led to positive assistive technology growth in the district.

Daily technology tips (<https://www.smores.com/a3xj>) are provided to guide teachers and allow teachers the flexibility to approach

their curriculum in new ways. In addition to using these tips to further their personal technology education, teachers are using these tips as classroom centers for their students, which allows students the opportunity to experiment and grow.

Instructional videos (<http://youtu.be/DmughhMIIMY>) are created to assist the special education teachers with IEPs and resources to understand special needs materials.

App purchases are made easy through our online purchasing procedure so teachers can request pertinent apps when they need them. Teachers simply complete the online form and submit the request. Tina reviews the request and then, if approved, sends the request to the Technology Department where it is purchased. The redemption code is sent to the requesting teacher who redeems the code in order to download the app.

Documents are created that inform and educate: Our AT & AIM book clearly outlines assistive technology and accessible instructional materials. (<http://key.aa1.k12.ia.us/wdbq/WDATBooklet2013.pdf>)

Assistive technology contact responsibilities are made clear through an electronic document that outlines expectations. (<http://key.aa1.k12.ia.us/wdbq/ContactResponsibilities.pdf>)

Steps to implementing assistive technologies are provided to reduce confusion and streamline the staff requests and implementation of assistive technology.

Bookshare and Read2Go are encouraged for students who are diagnosed as having reading or hearing difficulties. Instructions are provided for using Bookshare accounts.

The QIAT (Quality Indicators for Assistive Technology) Self-evaluation Matrices is used to evaluate our progress in implementing assistive technologies in the classrooms.

Almost all information is shared with staff on district servers. Staff members can access meeting notes, documents and forms through these servers.

Tutorials are created that assist and educate staff members. For example, to better learn about the iPad and the procedure for purchasing apps, staff members



can access a tutorial that answers most of their questions. (<http://images.pcmac.org/SisFiles/Schools/IA/Western-DubuqueCSD/WesternDubuqueHigh/Uploads/DocumentsCategories/Documents/WDiPadPoliciesProcedures.pdf>)

If students have specific learning difficulties, Web apps are created that address their specific difficulty. The Mobi program is used to create the apps.

Our Area Education Agency ([www.aa1.k12.ia.us](http://www.aa1.k12.ia.us)) is of huge assistance with all things dealing with assistive technology. Low tech and high tech technologies are available through our AEA, along with expert assistance when needed.

Students are free to bring their own devices (BYOD) starting in the seventh grade. By using their own technologies, students feel more comfortable while sitting in class and working at home.

The key to our assistive technology success is team work. We believe and expect that every teacher plays a crucial role in the success of our students. Being in a rural community means that everybody knows what everybody else is doing. The majority of our staff live in our district's communities. We get to know our staff members, not only professionally, but also on a personal level. As a result, everybody knows about our successes and failures. We do not have the option of leaving any student behind. Success is the expectation and our educational teams strive to follow our district's guiding philosophy of “Better Every Day.”



# Working with speech recognition and people who have visual impairment

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Over the last two years, I have been working very closely with a product called CDesk. CDesk is a suite of 20 applications that have been designed for the blind and visually impaired and is also accessible for those with physical impairment. It runs its applications (such as a word processor, Internet browser, email client and BARD/Bookshare interface) in an enclosed environment, meaning users don't need any familiarity with Windows in order to use it successfully. The image below shows the CDesk Main Menu and gives an idea of the layout of the software (see picture 1). Access to the applications is given through the keyboard alone, keyboard and mouse or through well-integrated speech recognition. Magnification options are provided, making it possible to enlarge most things, and speech output is also provided.

The Chicago Lighthouse (<http://chicagolighthouse.org>), where I work as an Assistive Technology Specialist, has been working with the developers of CDesk

to help develop the product through feedback from the low vision and blind community and also has been providing technical support for CDesk with a view to hiring members of the low vision and blind community to man the help desk. I have been working in this capacity from the start of the relationship, and, in that role, have trained a number of people with visual impairment on how to use a computer.

The level of prior computer knowledge my trainees have had has generally been very low. This is mainly due to the age range of the clientele, who tend to be seniors looking for an easy way to ease them into the communication age. Many of them have lost their vision fairly quickly and have no keyboard skills. Although learning keyboard layout is productive and a valuable skill, for many users, this can be a daunting task, especially when combined with learning to use the software. In addition, many users also experience physical disabilities that make them

unable to use a keyboard or mouse. In these situations, I turn to the speech recognition capabilities of CDesk to help bridge the gap between what they want to do and how they can achieve that goal.

CDesk uses the Microsoft speech recognition engine built into Windows 7 and 8 and provides customized interface to allow control of its various applications. This provides a good deal of flexibility in how voice commands are used. The user could, for example, utilize the Microsoft commands and say "Press Down" to move to the next item in a list. Alternatively, the user could utilize the CDesk command "Peggy down" to do the same thing. All CDesk commands start with the word Peggy, which allows the computer to recognize the phrase as a CDesk specific command and effuses the computer with some personality, making it more personable to the user. I have found the Microsoft speech recognition service to be very good at under-



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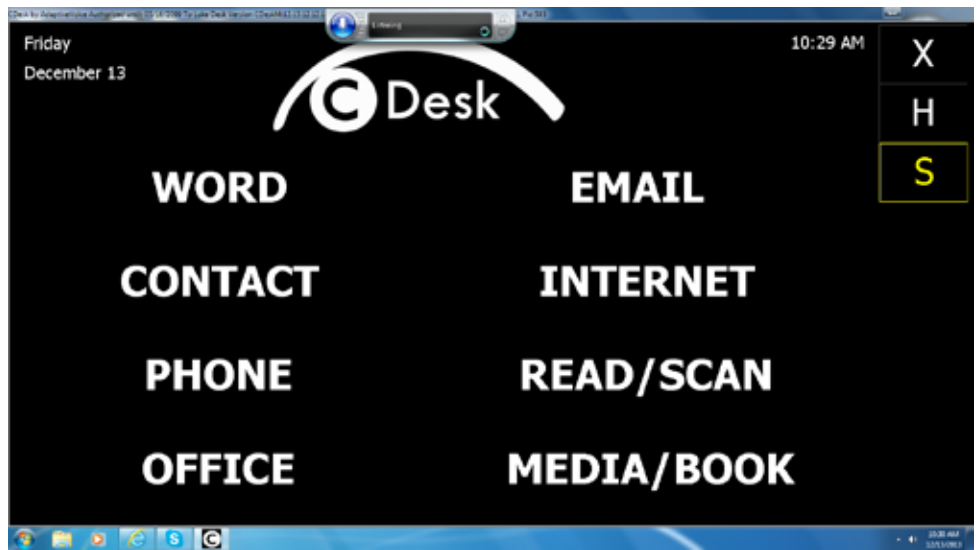
standing voice commands. Research recently carried out by Michael Knowles shows that Microsoft's speech service performs equally as well as Dragon Naturally Speaking (Published by South Oregon Arts and Research, 2013; see here [http://www.sou.edu/mcnair/presentations/Knowles\\_SOAR\\_2013.pdf](http://www.sou.edu/mcnair/presentations/Knowles_SOAR_2013.pdf)). Knowles shows that over a 30-day period, the percentage of accurate dictation results improves more rapidly with Microsoft's speech recognition service than with Dragon. Dragon, however, has a higher percentage accuracy rate to start, meaning that after 30 days, both engines arrive around the same result of 99.91 percent accuracy.

There are some general pointers that I have developed over time while teaching visually impaired seniors how to use speech recognition:

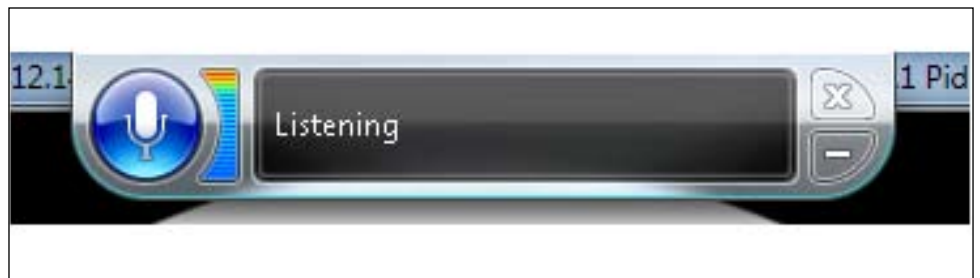
Microphone levels are very important. The level must be loud enough for the user's voice to be heard clearly, but quiet enough to avoid voice clipping. The Microsoft speech recognition control panel, visible whenever speech recognition is on, provides useful feedback in the form of a VU meter, on the right, that shows the level of input and turns red at the top whenever voice clipping is occurring. (see picture 2) For users who have a weak or variable voice pattern, this may require more than one speech profile to be created. One would be for the start of the day when the voice is stronger, and one for later in the day when the voice is more fatigued. In CDesk, users are able to swap between profiles through an accessible menu. It is important to have appropriate volume levels set before commencing any speech training.

A major way users can get confused is if they do not mute the microphone when not talking to the computer. This is especially a problem for the visually impaired as they may cause something unexpected to happen and then not be sure what has happened and how to get out of it. The need to do this may have to be reinforced multiple times for those with memory difficulties.

Users need to be aware that they cannot talk to the computer like another human being. It is natural for someone unfamiliar with the technology to assume that you can talk to the computer as you would



Picture 1 – The CDesk Main Menu is displayed in a high contrast format and all applications are displayed in an easy-to-access format.



Picture 2 – The VU Meter can be seen on the left. The bars run from blue, through green and then to red showing clipping is occurring.

another person. It's important to manage expectations in this regard to ensure the correct voice commands are being used to perform the necessary functions.

Repetition is key! This could be said of any new skill that is being learned. Repetition is the key to success, particularly with users who have difficulty with memorizing commands.

Dictation should be tackled in shorter phrases rather than in a "stream of consciousness" style. This allows users to check what is being typed as they go, making it easier to make corrections when necessary. For users with certain physical impairments, speaking in shorter phrases is especially important, as they run out of air more quickly, changing the timbre of the voice and leading to incorrect speech recognition. CDesk provides instant audio feedback while dictating, allowing users to hear what is being recognized by the speech recognition engine as they dictate.

These are some of the major factors that I have encountered while doing speech recognition training, which, if not handled correctly, can lead to frustration. Failure is most likely to be a result of the user's expectations not being met. This can be due to either the expectations being unrealistic in the first place or the setup and training with speech recognition being insufficient. This would then lead to a poor result for the user using speech recognition, causing them to conclude it does not work. I believe that keeping in mind these five factors while teaching speech recognition, particularly to people with a physical or visual impairment or those with memory difficulties, will lead to a higher success rate.

From my experience, failure is very unlikely to be caused by a user's accent or speech impairment, although the quality of recognition may be lower initially, particularly for dictation. This is usually remedied over time as the computer builds a profile of the user.

Command and control is likely to work well immediately. For example, in CDesk, the “Peggy” commands, such as “Peggy Start Word,” “Peggy Exit” and “Peggy What Time Is It?” will work for the vast majority of users without any training and almost irrespective of the quality of their speech.

The reason that command and control is easier for the computer than dictation is because it is listening for a very specific set of words. This is opposed to dictation, where the user could be saying anything. For some users, the ability to manipulate their computer, even if they cannot get consistent results with dictation, is life changing. They can, for example, access their emails and read them or have them read aloud, using simple speech commands. The ability to do this simple task, which most take for granted, can have a huge, positive impact on, for example, a person with a physical impairment who can’t access a computer using more traditional means.

For those who have a physical impairment, there are other interesting ways to utilize devices that can assist in aiding computer access. One example of a device that can be used to aid with speech recognition is a Bluetooth headset, as opposed to the more usual USB corded headset. (See Picture 3) This allows a user with a physical impairment to have the microphone accessible without the need to physically take a headset on and off whenever they want to change positions. The main limitation of such a headset is the voice fidelity, which is much lower than, for example, a USB corded headset. This leads to lower quality for both audio received through and audio transmitted from the headset. This can be problematic in speech recognition where the quality of signal reaching the computer from the microphone needs to be as clear as possible in order to achieve a good percentage of accuracy. The other issue with a Bluetooth headset is battery life – typically around six hours when in use, longer when in standby, however, in order to go into standby, the user needs to physically interact with the headset. Despite these limitations, in some cases the benefits may outweigh the cons.



Picture 3 – CDesk’s developer, Michael Wechter, teaches speech recognition to Tammie Stevens of The Cove Center, Merced, CA. The headset she wears is connected to the computer via a USB cable.

Another innovative solution tried by a colleague of mine is the use of a monitor stand clamped to the front of a desk rather than the back to assist users who are confined to a wheelchair. The articulating arm of the stand is positioned to come out from the front of the desk, meaning the user can more easily position their wheelchair in front of the monitor, without the desk being in the way. The screen can also be positioned at the appropriate height, allowing the user to get their face very close to the screen, a necessity for some people who are visually impaired.

Solutions like these can be implemented using commercially available products and may be of great benefit to the user. The physical comfort of the user can be just as important a factor as the psychological comfort in ensuring a successful outcome.

In conclusion, speech recognition can be a very powerful tool for those with a visual or physical impairment that can allow them to interact with a computer in a naturalistic manner. There are a number of good solutions for speech recognition, such as Dragon Naturally Speaking and Microsoft’s own speech recognition service, as well as mobile solutions, such as “SIRI” on the iPhone. All of these solutions have the capability of providing good quality speech recognition. When taking into account the technical abilities of the user, as well as the level of

visual impairment, a solution, such as CDesk, that simplifies and makes accessible the most used computer functions makes a big difference to whether the user persists in learning the necessary skills. Ease of use is a key feature of any product, whether designed for those with disabilities or not, and if the five points discussed earlier are adhered to, it can greatly assist in making speech recognition consistent with user expectations. This, of course, has to be matched by the user’s willingness to learn the necessary commands to manipulate their computer. However, once a user experiences the power that using their voice can have, they are usually more than willing to learn how to properly control that power! ■

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