

Innovative Technology for Individuals with Autism

Christian Karter, MA
Educational Technology
Specialist

Who am I?

- Monarch Center for Autism's Educational Technology Specialist.
- I have worked at Monarch Center for Autism for 10 years.
- I also worked for Monarch Teaching Technologies and helped design elements of VizZle.
- My chief responsibilities are the data system and introducing new technology into the classrooms.
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Christian Karter MA

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- We introduced an iPad with a mix of Educational Apps at age 2.





Classroom & Home Technology



Human Interface Devices

- Human Interface Devices are technologies that accept input from humans, interpret them, and communicate with that input to a computer.
- A good example of this is a keyboard or mouse.
- In the world of special needs it can also be the method in which they interact with the world. Thus there are specialized HID's to ease this process.
- Trackball Mice: Allow children to have a larger surface area to interact with the computer. Great for individuals with dexterity issues.
- Stationary only the ball moves, with large buttons instead of tiny clickable areas.
- Range from \$40 - \$90



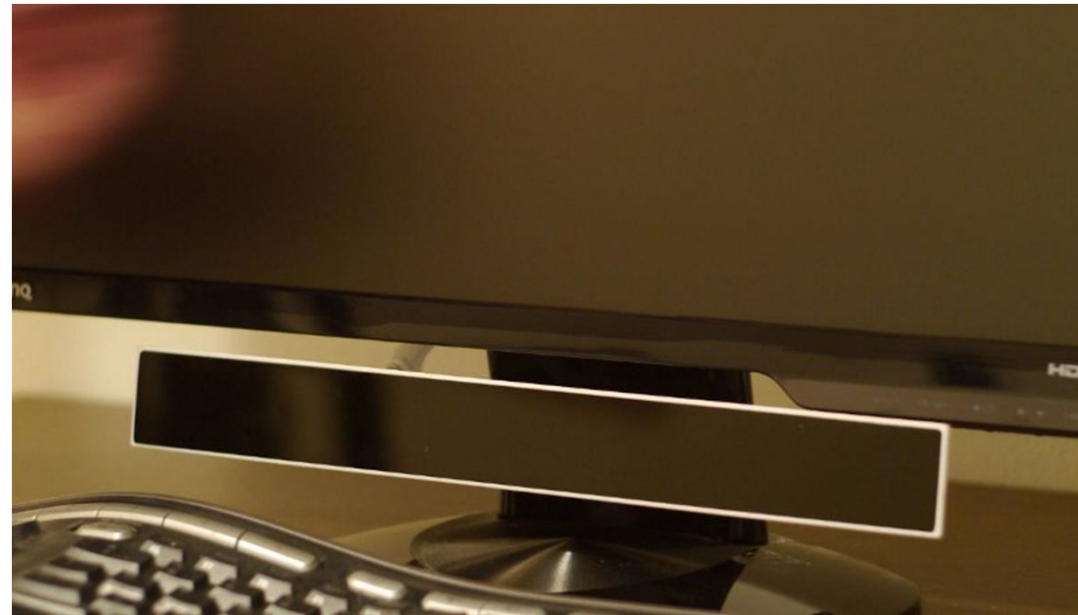
Advanced Switches

- Lack of Dexterity or other impairments may mean you need a specialized way to interact with software. Advanced switches allow you to interact and move through software making selections.
- The AbleNet Pillow Switch features a soft foam surface that is ideal for head or cheek activation.
- The AbleNet Blue2 Bluetooth Switch provides single or dual switch access via Bluetooth connection to an iPhone, iPad, iPod, or Mac. Includes an integrated rechargeable battery, two external switch jacks, and tactile feedback.
- The AbleNet Candy Corn Proximity Sensor Switch is a compact, wired switch that activates when a body part is within 10-millimetres of the switch top. Highly sensitive, wave your hand or body part to activate the visual and auditory cues.



Gazepoint GP3 Eye Tracker

- This is an example of eye tracking hardware. This allows an individual to click with their eyes.
- This particular tracker is used to track focus in order to identify and minimize distractions.
- It can show “heat” patterns of where the person is focusing.
- Eye contact is such an important facet of assisting individuals with Autism.
- This would be used by software developers.
- Open standard API
- Portable – 320 x 45 x 40 mm (250g)
- <https://www.gazept.com/>



Price: \$495-\$3000

Magic Touch



- Made by Keytech
- Turns any monitor into a touch screen display, by putting a touch panel overlay on top of your current monitor
- \$200-\$400 based on size of the screen.

Touch Screens



- Example we use:
HP Compaq L2206tm 21.5-inch
LED Backlit Touch Monitor
Currently \$299.00 or less
- Other Options:
Dell S2240T 21.5-Inch LED
\$359.00 or less
- Acer T232HL- 23" IPS LED HD
\$299.00 or less

SMARTBoards

- Smartboards are a great way to engage a group.
- At Monarch Center for Autism we use 25+ SmartBoards.
- Staff build lessons on the SmartBoard Notebook software or Vizzle and share them with each other.
- These lessons are customized to the IEP goals and objectives they are working on with the students.
- Smart Light Raise
- Ability to project up to a 100" display.
- Differentiates between touch and pen use.
- Has built in speakers and microphone.
- 2 to 4 touch points depending on the model.
- No actual board to damage.
- Access to Smart's over 60,000 learning resources.



Mini-pocket Projector

- These are usually used in the business field for the traveling salesman.
- Need: Some students require a 1 on 1 interaction in a separate environment other than the group.
- With an iPad connected to a Mini Projector a staff member can set up a classroom activity almost anywhere.
- Works with both android and iPad devices.
- Some accept HDMI and component connections.
- Can play back video and images from an SD card as well. This can also eliminate the need to bring another device with you.
- Considerations battery life and brightness.





Autism Home Technology

Autism & Home Automation

- <http://www.youtube.com/watch?v=6EsJw5-D2hY&t=0m48s>

Amazon Echo

- Amazon Echo is an example of Artificial Intelligence.
- Amazon's voice is known as Alexa.
- Amazon Echo is made to be placed around the house and it answers questions for you and acts as a personal assistant.
- Works really well with IFTTT (If this then that)
- Currently sell 3 different versions Dot, Tap, and Echo



\$49-\$179

Phillips Hue

- Hues are smart light bulbs.
- They can be used to change the color of a whole room.
- If prompting an individual on the spectrum, sometimes it is difficult to direct their attention to the prompt.
- Hues paired with IFTTT can create schedules in which this smart device can change colors at a particular time or when an event happens.
- Example: Shower time - the light in the family room turns Blue to prompt.
- Outside Door opens at a time outside of the usual parameters – the bulbs all turn red to alert you.



Price: \$39-\$300

Smart Things Sensors

- Elopement is a real life, terrifying, situation that many families with autism face.
- Smart things sensors allow you to place sensors on your doors, windows, and even cabinets.
- There are even motion sensors.
- It can then activate services or notify of these events.
- Works with IFTTT



Price: \$30-\$200

AppleTV 4th Gen, Amazon Firestick, & Fire TV

- Can plug into a TV or projector.
- AppleTV: Using AirPlay technology you can mirror your iPad, iPhone, or Mac screen on your TV or through a Projector.
- Firestick: Using wireless display feature on android can mirror.
- Great for teaching and presentations.
- App stores available for both to download Apps to the device to interact with using the remote. Health fitness apps, games, entertainment, and news.

\$149



\$39.99



\$89.99



Bluebee Pals

- Plushes that pair with an iPad via Bluetooth.
- Comes in 6 Personalities / plush types.
- Moves its mouth as it sings and reads them stories. After can ask them comprehension questions.
- Rechargeable.
- Can read any text allowed that the iPad will play. Will read the output from an AAC app. You can use the onboard iPad Accessibility feature to read the text that is on the screen and type out the language.



\$66-\$75

Augmentative and Alternative Communication

- AAC comes in 2 forms unaided, sign language, and aided = devices.
- Both can be used in conjunction with each other.
- With AAC devices symbols are heavily used.
- Children with Autism are found to have strong visual processing skills, and low expressive communication. This makes them good candidates for AAC devices.



Tablets Personal or ?

- When economically possible a communication Tablet/iPad should never be the same device as the one they play on.
- Communication device should be visually distinct. Use color coded cases.
- Communication device should only have their Communication app loaded on it.
- Make use of such functions as Guided Access to Lock their Communication App into place.
- Always have a form of backup running on their device – on iPads recommend iCloud.



“Big Mack”

- "Big Mack": A single switch/button device available from AbleNet.
- Usually paired with PECS
- allows for 20 seconds of record time.
- Around \$89.00.



GoTalk

- GoTalks come in many different models, 1, 4, 9, 20, 32, pocket size, and button size.
- Most GoTalks come with several levels that are all programmable.
- They range from \$12 to \$599
- Large disadvantage. No way to back it up.



Dedicated Devices

- Dynavox is probably the most widely known manufacturer of devices.
- Well developed
- Ability to backup, use custom images.
- Con: \$3000 - \$8500



About Android

- Android is an operating system developed by Google. Current OS Version is called Nougat. Google names the OS after candy.
- Android OS is found on Samsung, LG, Amazon, Sony, Google and many other companies devices. The OS is free for them to license.
- They come in many form factors.
- Android tablets range in price and in quality. Recommend staying with a major brand and read reviews.



Android AAC

- Amazon's Fire tablet is an android device.
- Android has a large Market place of Apps through the Google Play store.
- Unfortunately none of the big name in AAC apps such as Touch Chat or Proloquo2Go are available for Android devices.
- Dynavox T10 is an android based tablet with their Tobii software loaded on to it.



Windows Surface

- Made by Microsoft.
- Current Models are Surface Book & Surface Pro 4 runs full Windows 10, released October 2015.
- This means it can run all Windows 10 applications.
- Currently comes in a single form factor with a 10.8"-13.5" inch screen.
- Although pictured and advertised with one the keyboard and stand do not come with the tablet .
- Has traditional USB ports to connect with traditional devices like hard drives and thumb drives.
- Surface Pro 5 is anticipated this Spring 2017.



Priced \$499-\$1499

Apple iPad

- At Monarch Center for Autism we use approximately 150 iPads.
- The iPads are assigned to Teams, SLPs, Behaviorists, OT's, and students directly.
- We use a mix of iPad 2's, 4's, Air's, and Minis
- iPad Pro's with 12.9 displays were introduced for our Art Classes and Music.
- iPads have been a great boon to our schools educational resources as it allows us to be more mobile with our teaching.
- They serve as a wide variety of uses such as educational apps for the student's, reinforcers, visuals such as schedules and token boards, data collection, photography and video capturing, and much more.



Apple Pencil

- Apple Pencil allows you to draw on an iPad Pro screen.
- Works on both the 9.7" and 12.9" screen.
- Different than a traditional stylus as it pairs with the iPad via Bluetooth and has gyroscopes to help determine the angle on which you are holding it.
- This gives a more natural feel to writing. Can be used for OT's. Recommend using a gummy grip.



iPad Carts and Syncing

- Managing iPads has its own unique sets of challenges.
- We use 5x Bretford carts, and one Brentford Tray to charge & sync our iPads.
- Our most recent cart is equipped with Bretford's new PowerSync Technology which allows us to see when the whole cart is charged, and allows us to set notifications if iPads are removed from the cart during restricted hours.
- We use a dedicated computer to sync them all.
- For protection We primarily use Otterbox Defender cases.
- This is the case we use at Monarch Center.
- Three layers of protection:
 - 1. Clear protective membrane on touch screen
 - 2. High-quality polycarbonate shell
 - 3. Durable silicone skin



\$49.99 - \$89.95

Otterbox Accessories



- Otterbox Utility Series Latch II
- Otterbox has begun to make a set of carriers and straps for their Otterbox case.



- Otterbox Agility
- A case system which allows you to magnetically mount iPads to a wall.
- We use these with our Gross Motor room where we have stations set up for the students to work from.
- Our iPads have video models on how to do each task at each station.

MoKo iPad Mini 4 Case

- Very affordable case and durable.
- Comes in 6 colors
- Recommend using with a screen protector to protect against scratches
- Carrying handle, also converts into a 2 way stand when propping up on a table.
- Con: Screen not directly protected from impacts.
- https://www.amazon.com/gp/product/B0146MZ1FG/ref=oh_aui_detailpage_o04_s00?ie=UTF8&psc=1



Price: \$13.95

Scosche Magic Mount

- Magnetic Mounts, safe for the iPad.
- At Monarch Center we have them on the back of most of the iPads.
- Works and adheres to Otterbox case without an issue.
- A metal piece with a 3M adhesive sticks to the iPad. The Magnetic part of the mounts can be placed on the walls or other surfaces.
- Great for bathrooms and even desks.



Price: \$10-\$40



Wearables & Accessories

Wearables & Autism

- Wearable technology is a booming trend.
- For children with Autism they stand heavily benefit from this technology, as it can help them adapt to their everyday life.
- From a research structure wearables allow us to track and gain more information about the relationship between environmental factors and the student's reaction to them.



Apple Watch – Autism

- The watch has the ability to connect with your iPhone and share data from apps.
- Native Apps can now run on the watch independent of phone.
- Any internet access still requires it to be tethered to a phone.
- Using features such as Tap or Messages you could prompt a student in a more socially appropriate way.
- There is the potential for multiple prompt types physical (through vibration), visual (through images or messages), verbal /audio (from built in speakers)
- The Apple Watch has built in sensors to monitor things such as heart rate. These sensors could allow for additional data to be tracked on a Student with ASD.
- They could also be beneficial in helping an individual know when they are upset.



Apple Watch Demonstration



Apple Watch Demonstration



Apple Watch Demonstration



Apple Watch Demonstration



Apple Watch Demonstration



Apple Watch Demonstration



Apple Watch Demonstration



Tile & Pocketfinder

- Originally started as a Kickstarter campaign. They were trying to raise \$100k to create this project
- They were over \$2.6 million when the Kickstarter ended!
- Essentially it is a little key fob you can attach to anything and locate that item with your mobile device using Bluetooth.
- Some children with Autism have elopement behaviors.
- Pocketfinder is a mini GPS tracking device. This device can be tracked from any iOS device or computer.
- The device is small enough that can be placed in clothing or book bag.



My Buddy Tag Locator

- Inexpensive Bluetooth tracker.
- Needs to pair with a cellphone
- Range up to 100 feet.
- Set Geo Fence boundaries if wearer goes outside of the boundaries you will be notified.
- Will also send an email to desired contact as well, so if giving
- Water submersion notification, if kid falls in pond or pool.



\$37.99