Mobile Technology and Apps for AAC

Andrew Jinks, MA CCC-SLP, ATP
UPMC Center for Assistive Technology
University of Pittsburgh
Pittsburgh, Pennsylvania

Fall, 2013

Brief History of AAC Technology

- 1980’s – VOCA’s - Devices Built from Scratch
- 1990’s – Non-dedicated devices –
  - Laptops become AAC devices
- 2000’s – SGD’s - Hybrids - AAC Devices running Windows
- 2010’s – Tablets, Smart Phones and Apps

Early 80’s – ACS devices

Voice Pac with Echo Synthesizer

End Pac with Scanning Board

Real Voice

Minspeak Talker devices of the 80’s and 90’s

Touch

Lingo

Delta

Intra

Alpha

Walker

1990’s Personal Computer as Communication Devices with AAC Software

Windows Talking Screens on Desktop PC

Meyer-Johnson Boardmaker

King Software Speaking Dynamically Pro

Imman Innovations Word Power

Minspeak Synthesized Devices

Liberator - 1990

Vanguard - 1990

Pathfinder - 2000

Vantage 2005

ECO - 14 - 2007
As early as 1981, Medicare has covered communication devices.

Up until 2000, Medicare coverage of AAC devices was determined by ad hoc decision making. Each Medicare recipient had to establish that an AAC device “fit” within one or more Medicare covered benefits categories, durable medical equipment (DME) or prosthetic devices, and was “reasonable and necessary.”

In 2001, Medicare recognized Speech Generating Devices as items of DME, and began providing coverage based on medical need. Medicare determined that SGD’s are no longer a “convenience item”, but are “medically necessary.”

Regional Medical Review Policy for Speech Generating Devices was issued. This policy included the name change from AAC to SGD. It described the clinical assessment and report Medicare will require SLPs to complete to support an SGD funding request.

### Speech Generating Devices

- **Definition** – Speech-generating devices (SGDs), also known as voice output communication aids, are electronic augmentative and alternative communication (AAC) systems used to supplement or replace speech or writing for individuals with severe speech impairments, enabling them to verbally communicate their needs – Wikipedia
- According to federal guidelines - Dedicated communication devices with limited applications – such as Environmental Control Units, Control interface for Personal Computers, limited games, and limited songs / music.

### Laptops and Touch Screen PC’s as Communication Devices (2000’s)

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>FreedomZoom</td>
<td><img src="image1.png" alt="FreedomZoom" /></td>
</tr>
<tr>
<td>All Memory</td>
<td><img src="image2.png" alt="All Memory" /></td>
</tr>
<tr>
<td>Freedom Talk</td>
<td><img src="image3.png" alt="Freedom Talk" /></td>
</tr>
<tr>
<td>TANGO</td>
<td><img src="image4.png" alt="TANGO" /></td>
</tr>
<tr>
<td>WordsTalk</td>
<td><img src="image5.png" alt="WordsTalk" /></td>
</tr>
<tr>
<td>Tuff Talker</td>
<td><img src="image6.png" alt="Tuff Talker" /></td>
</tr>
<tr>
<td>Freedom2000</td>
<td><img src="image7.png" alt="Freedom2000" /></td>
</tr>
<tr>
<td>ATI Mercury</td>
<td><img src="image8.png" alt="ATI Mercury" /></td>
</tr>
<tr>
<td>GUS Communicator</td>
<td><img src="image9.png" alt="GUS Communicator" /></td>
</tr>
<tr>
<td>WordsTalk Convertible</td>
<td><img src="image10.png" alt="WordsTalk Convertible" /></td>
</tr>
<tr>
<td>ATIOptimal</td>
<td><img src="image11.png" alt="ATIOptimal" /></td>
</tr>
</tbody>
</table>

### Handheld Speech Generating Devices (2000’s)

- **Handheld IMPACT**
- **WordsTalk**
- **Say A-Song Handheld**
- **WordsTalk Convertible**
- **DynaVox**
- **Tango**
- **WordsTalk Convertible**
- **Tuff Talker**
- **Freedom2000**
- **ATI Mercury**
- **GUS Communicator**
- **Handheld IMPACT**
- **WordsTalk**
- **Say A-Song Handheld**
- **DynaVox**
- **Tango**
- **WordsTalk Convertible**
- **Tuff Talker**
- **Freedom2000**
- **ATI Mercury**
- **GUS Communicator**
- **eesence Portable**
- **Laptop - ATalk**
- **Tablet - TouchTalk**
- **Handheld - Small Talk**

### Disability Specific AAC Devices for:

- **Aphasia and ALS**
  - eesence Portable
  - Laptop - ATalk
  - Table - TouchTalk
  - Handheld - Small Talk
Benefits of Traditional Speech Generating Devices

1. Language Representation systems
2. Research and Development of optimal hardware for individuals with disabilities
3. Multiple access techniques
4. Incorporation of current computer technology
5. Experience with thousands of customers
6. Software design by speech-language pathologists
7. Marketing experience
8. Manufacturer representatives across the country
9. Studies validating benefits of SGD’s
10. Support / Training opportunities
11. Funding departments
12. Development and support of field of AAC

Q: What significant event happened in April, 2010 to change the field of AAC and Mobile Technology?

A) Eyjafjallajokull volcano in Iceland erupts
B) explosion on a BP oil drilling rig off the coast of Louisiana
C) Apple releases the iPad
D) Kyrgyzstan President Bakiyev flees Bishkek amid deadly protests

A: C) Apple release the iPad

iPad Time Line

April 3, 2010 - The first iPad was released - Depth and weight unprecedented. Apps introduced.
2011 – 2nd generation – Front and rear facing cameras
   Face Time
2012 – 3rd generation – Retina display – 5-megapixel camera – voice dictation & 4G
November 2, 2012 - iPad Mini released
2013 – 4th generation – All digital connector replaces 30-pin – Siri voice recognition

An iPad can:
shoot video, take photos, play music, and perform Internet functions such as web-browsing and emailing. Other functions—games, reference, GPS navigation, social networking, ability to download and install apps. As of June 2013, the App Store has more than 900,000 apps by Apple and third parties.

2010 – iPad hits the market

- Consumer (family) comments
  - Benefits of iPad vs. traditional SGD's
- Weight differential (ounces vs. many pounds)
- "Coolness"
- Screen quality
- Apps – Usability
- Cost (hundreds vs. thousands)
- Marketing
What is Mobile Technology

- Definition according to Wikipedia.

Mobile Technology - refers to 3 types of devices

- Personal Digital Assistants (PDAs)
- Smart Phones
- Tablet computers

Personal Digital Assistant

- A personal digital assistant (PDA), also known as a palmtop computer, is a mobile device that functions as a personal information manager. PDAs are largely considered obsolete with the widespread adoption of smart phones.

Smart Phones

A mobile phone with more advanced computing capability and connectivity. The first smart phones combined the functions of a personal digital assistant (PDA) with a mobile phone. Later models added: portable media players, compact digital cameras, pocket video cameras, and GPS navigation units. Many modern smart phones include high-resolution touch screens and web browsers with high-speed data access provided by Wi-Fi and mobile broadband.

Tablet Computers

A mobile computer with display, circuitry and battery in a single unit. Tablets are often equipped with sensors, including cameras, microphone, accelerometer and touch screen, with finger or stylus gestures replacing computer mouse and keyboard. An on-screen, popup virtual keyboard is can be used for typing. Tablets are typically larger than smart phones at 7 inches or larger, diagonally.

How Mobile is It?

- V Max SGD (2007)
  - Weight 6 lbs. 14 oz.
  - “You can put handles on a refrigerator, too”

iPad: Weight: 1.5 lbs. & getting lighter?

Limitations of Off-the-Shelf Mobile Technology in serving as AAC devices.

- Durability
- Speech volume
- Touch sensitivity adjustment
- Access techniques
- Apple – unlockable when purchased
  - (although locking app is available)
- Android – locking feature
Tablet Communication Devices

- ACCUVoice Communicator
- Saltillo Nova Chat
- PRC Accent

Batavia and Hammer’s 17 criteria for evaluation of assistive devices:

- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability

PRAT iCAT Workbench AT Reviews

- DynaWrite
- Chat PC Silk
- Xpress
- iPad
- Proloquo2Go
- Predictable
- Lingraphica

Evaluating SGD’s and Mobile Technology

- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability
- Affordability

Netbooks

Laptops to Netbooks

iPad | Netbook
---|---
Total size | 9.5” x 7.5” | 8.9” x 6.5”
Can use pointers | No (requires finger) | Yes (any pressure)
Weight | 1.5 lb. | 2.1 lb.
Power button | Accessible, easy | Somewhat accessible
Menu button | Accessible | None
Start up time | Instant on | 20 seconds
Processor speed | 1 GHz | 1.33 GHz
Storage space | 16, 32, 64, 128 GB | Flash drive 32 GB
Battery life | 10 hours | 5 hour
Keyboard | On-screen / docking | Built-in real keyboard

iPad | Netbook
---|---
Internet connectivity | Wireless, or 3G/4G | Wi-Fi (regular) and Ethernet (wired)
Switch/scanning capability | None but Bluetooth switch interface | Regular USB ports
Web page compatibility | Standard pages only | Any
Internal speaker | Pretty good but not loud enough at McDonald’s | Not loud enough for AAC; requires external speaker
Built-in microphone | Yes | Yes
Built-in camera | Yes | Yes
External CD/DVD | No | Yes
Price | $499 - $899 | About $550
Applications available | 900,000+, only from Apple Store | Any Windows software
iPad Memory - How many Gigs do you need?
• A) 16  
• B) 32  
• C) 64  
• D) 128

We use a lot of AAC apps - that coupled with graphic intense articulation and language apps fills up a device quickly. I have an iPad 2 with 32 that is maxed. I have an iPad 4 with 64 that I have not maxed.
On the 32, I have to swap out AAC apps all the time b/c the pictures and voices take up too much space. I have not had to do that on the 64 so far.

Rule of thumb for any tech - buy a big as you can afford.

Angela Standridge, MA CCC-SLP, ATP  
Special Education Solutions, Assistive Technology  
Region 4 Education Service Center  
Houston, TX 77092

Access and Peripherals for Enhancing Mobile Technology to serve as AAC devices
- Keyboards
- Switch Access
- Speakers
- Cases

Apps – Where did they come from?
- 2002 - First apps developed by Blackberry  
- 2008 – iTunes App Store emerges for iPhones  
- 2010 – Android Market begins  
- 2012 – iTunes – 25 billion downloads  
- Google Play – 15 billion  
- May 2012 – The most popular mobile game had over 1 billion global downloads

Article Source: http://EzineArticles.com/7760835

Capabilities of Mobile Technology & Apps
- Major Tablet brands: iPad – Kindle – Nook - Galaxy – Surface  
- Multi-purpose apps – Music, Movies, Internet access, personal and interactive Games, U-tube entertainment and instruction, Education, Rehabilitation, Fitness, Weather, Note taking, Calendar, Social Media, GPS, etc. infinitum

PC vs. Apple – Microsoft strikes back
- Benefits of the Microsoft Surface Tablet over the iPad  
  - Built in Stand  
  - Built in manual keyboard  
  - USB port  
  - Windows OS  
  - Price  
  - Limitation  
  - Apps
**App Stores**

- Apple - iTunes
- Android - Android Market became Google Play, Amazon.com, many others
- Microsoft - Windows Store

**The Advent of AAC Apps**

- Proloquo2Go – The Granddaddy of AAC Apps
  - Benefits of Proloquo2Go
    - Comprehensive
    - Large Library
    - Programming ability
    - Keyboard for Spelling
    - Word Prediction

**Apps beyond Proloquo2Go**

- Basic – Digitized Speech
- Scanning
- Spelling
- Comprehensive

**Digitized AAC APPS**

**Scanning – capable**

- Go-Talk
- Tap Speak Choice
- Proloquo2Go

**Spelling apps**

- SpeakIt
- Verbally
- Predictable

Blog Comment: Verbally is great, but Predictably has many more features. I like how social media and email is integrated. There are more tools for speech and auditory feedback options. There’s even a write pad that can be configured that integrates word prediction with character recognition. Access methods can be customized for both touch and scanning.
Comprehensive

- Proloquo2Go
- Touch Chat Suite
- Sono Flex

AAC App features

- Tremendous variety from simple (Yes/No) to complex (Proloquo2Go)
- Typically somewhat easier to program than traditional SGD
  - Ex. Behaviors for a button – 10 vs. 225
- Inexpensive software (Free – a few hundred dollars)
- Limited support
- Limited training information
- No funding support

How to Decide?

- Cost
- Design
- Recommendations
- Reviews

Reviews

- iTunes / Google Play / Windows Store
- PRAT iCAT Portal
- AT Tech Connect: http://www.aactechconnect.com/
- SLP Geek: http://www.geekslp.com/
- ASHA Leader – “In search of the perfect speech/lang. app”
  - http://www.asha.org/Publications/leader/2012/120403/Internet--In-Search-of-the-Perfect-Speech-Language-App

Miss-Apps

- Crashers
- Amateur Hour
- House of Straw (Poor Architecture)
- Identify Thieves

Miss-Apps Lead to Dis-App-pointment

- My mind, it's wide open.
- It’s like a hollow tunnel of air.
Hybrids • The AAC Manufacturers Big 6 (now 4) Check In

- Saltillo – Nova Chat series
- tobiiATI – iSeries
- PRC (Words +) LAMP Words for Life
- DynaVox (Toby Churchill) T-10

Saltillo Nova Chats

NOVA chat 10 has the largest display of any Chat communication device. It offers the well-known Chat Software on an Android platform. Like all “Chats,” NOVA chat 10 offers a durable yet sleek portable design, with features that include a 10” display, switch scanning, Social Chat, IVONA speech synthesizer, and many other Chat features.

Tobii ATI iSeries

The Tobii I-12 and Tobii I-15 are speech generating devices that enable effective communication in all forms – from voice output, environmental control, and computer access, to long distance communication. A rugged design, unparalleled power management, support for touch to gaze interaction and more make the I-Series ideal for everyday use.

PRC - Words for Life (WFL) – Nova Edition

Words for Life (WFL) - NOVA Edition features the WFL 84 location vocabulary on an Android platform in a durable, sleek portable device. The WFL vocabulary is an adaptation of the Unity® language system that supports the Language Acquisition through Motor Planning (LAMP) approach.

DynaVox T10

It’s so small. At 19.5 lbs, with an average thickness less than 3/4 of an inch, it’s the smallest and most portable communication tablet of its kind. It’s easy to take with you wherever you go. The industry’s first dedicated Speech-Generating Tablet.

Hybrid Features

- Support of Major Manufacturers
- Training
- Years of Research experience backing software
- Incorporation of tablet technology
- Locking feature – Only AAC app boots.
- Ability to Unlock to access OS
- Ability after Unlock to access Apps
Augmentative Communication Device manufacturers continue to be driven by the fact that private insurance will only pay for Medically Necessary speech generating systems. Computer access, Internet access, Social Media access and all other non-speech and language accessibility continue to be denied by private insurers. This has limited and controlled the way in which AAC device manufacturers operate.

Roughly 2.5 billion people, more than one-third of the world’s population, currently use the Internet, and another 2.5 billion are expected to go online by the end of this decade.

As of March 2012, 31% of U.S. Internet users were reported to have a tablet, which was used mainly for viewing published content such as video and news. Among tablets available in 2012, the top-selling line of devices was Apple’s iPad with 100 million sold by mid-October 2012, followed by Amazon’s Kindle Fire with 7 million, and Barnes & Noble’s Nook with 6 million.

As of May 2013, of mobile developers – 93% were targeting smartphones versus 70% for tablets.

“Millenials are not the only ones with high daily usage of digital media (online, mobile, video, social, gaming, and so on). One can see high consumption with Gen X and baby boomers, too. Given these trends, don’t count baby boomers out of digital media consumption, as baby boomers plan to maintain their youthful habits all the way into their golden years.” - Adele Lassere


2. Sony Betamax (1979) Betamax was defeated by VHS video recording when over forty companies decided to use the VCR-compatible format instead.
10. Cocaine® Energy Drinks (2006). Not long after its launch, the FDA pulled the drink from store shelves.
AAC App-Vertising
Eye gaze access
iWatch and Google Glass
BCI Ipads
Robot-aided communication
Game-based AAC-learning Apps
GPS – environmentally-based vocab Apps
Telerehab / social networking and cafes

Future Mobile Technology and Apps

iWatch (Prototype)

It’s time!

Google Glass

REFERENCES


IN Conclusion ……………

Bicycle Built for Two
Heroes and Super heroes
1. Indiana Jones
2. Yoda
3. Mario Lemieux
4. Sully
5. Harry Potter
6. Michael Phelps
7. Spiderman
8. Ironman
9. Thor
10. Angry Bird
11. Merida
12. Si Roberts
13. Dick Tracy
14. Mr. Magoo
15. Archie