Is There an App For That? Developing an Evaluation Rubric for Apps for Use with Adults with Special Needs

Taylor Buckler, BSN Honors Student
Faculty mentor: Moya Peterson, RN, PhD, APRN, FNP-BC
University of Kansas School of Nursing

Abstract

With the rise of mobile technology, there are now thousands of applications (apps) at our fingertips. Many apps could potentially enhance the lives of adults with special needs, but there lacks an evaluation tool and central repository of apps for this population. A tool that was developed for evaluation of apps by teachers for the classroom was adapted by the researchers for use in this population. The purpose of this study was to find apps that enhance the lives of adults with special needs and validate a tool for evaluation of their usefulness through a pilot study. Selected apps were evaluated using a tool adapted to address such issues as cost, benefits of use, ease of use, alteration, and application to the population. A pilot group of 10 parents, siblings, and caregivers of adults with special needs were recruited for this study. Those recruited reviewed predetermined apps and used the adapted evaluation tool to review the apps. Based on this process, recommendations were made for apps that were useful for adults with special needs and recommendations were made for continued development of the evaluation tool. Findings helped identify applications that adults with special needs can use to enhance their lives and assist families in finding and evaluating applications. An expanded study is being planned based on the results of this study. It is anticipated that this will result in adaptation of the tool and then retesting with a larger participant number. The goal is to publish the tool and the results for these apps as well as others on a public access website so that family and caregivers can use it to evaluate apps that are appropriate for use by their adults with special needs.

Introduction

The world entered a new era with the introduction of the iPod and iPad technology. The touch technology reinvented how computing is done and the size of the machines rapidly changed where and when people are able to access technology. However, the impact that it has had on special needs populations and education is only beginning to be recognized. More and more projects are being done to take the ease and engagement that the iPod/iPad offer to enhance learning in students of all types. Remarkable advancements have been seen in the interaction/communication of non-verbal people as the iPod/iPad has given them the abilities to interact with the world around them. The breadth of vocabulary and abilities that some students with autism have acquired but previously were unable to express has stunned educators. There are many instances where educators have taken these tools and made extraordinary progress with individual students with special needs. Parents are beginning to engage their children at earlier

ages in these technologies to increase or augment their child's learning. Word travels quickly on the Internet when an application (app) is found that assists children in learning or communicating through news stories and websites dedicated to this topic.

However, adults with special needs have different requirements for their learning. The emphasis in their lives may not be the mastering of math skills or reading skills as with school children. Their needs are more geared toward obtaining or the adaptation of daily living skill, ways to keep lists so that they may complete appropriate tasks, or learning to communicate so that they can successfully function in society. The apps for these types of skills are very limited when compared with traditional educational apps (math, reading, etc.).

With hundreds of apps being published on a daily basis the research team endeavored to find some of these apps and develop a tool that will assist parents, siblings, caregivers, and the adults with special needs evaluate an app and determine whether not it is useful for their adult or themselves. Some apps are free, some are inexpensive and some are quite costly. With adults with special needs having limited funds, the app purchases must be made carefully and judiciously so that money will not be spent only to find out that the app is not useful to them.

The goal of this study is to pilot an evaluation rubric for applications with parents or siblings of adults with special needs. The research team endeavored to develop a rubric that can give insight to the apps' strengths and weaknesses so that purchasers of the apps can know what app will best assist their adult in living a full, independent life. A secondary goal is to discover apps that can assist adults with special needs in reaching that full, independent life.

Literature Review

With the revolutionary changes in technology, the use of technology with special needs adults has become increasingly relevant. Unfortunately, the focus is largely on the use of new technologies with the special needs children, not adults. The literature on the use of technology with special needs adults is scanty, prompting the need for more research on this topic. While there is no literature on the use of "apps" in the special needs adult population, there is some literature on other types of technologies and their use in this population.

The overarching purpose of these assistive technologies is to increase the independence of adults with disabilities. Storey (2010) outlines the use of assistive technology in the realm of independent living using "smart" technology. These technologies include a wide variety of assistive tools to aid in the independence of individuals in their home setting from controlling appliances to monitoring the safety of the individual (Storey, 2010). While some of the technology requires

specific devices, many of them can be used with computers, tablets, and smart phones. Using this technology, adults with disabilities have the potential to live nearly independently, with as little technology as a smart phone or tablet which are readily available and becoming increasingly more affordable in our society. This technology can assist the adult on many levels dependent on what the adult needs to function. Webcams can monitor them in their household and smart phones with GPS capabilities can track their movements in the house or outside of their home making it a safe environment for them to function and live. Alarms on phones can alert the adult when it is time to complete an activity or to take a medication. Emergency response systems can be notified wirelessly when needed. There are also a variety of telemedicine or telehealth programs that can be accessed from their homes.

Time management is an issue for many adults regardless of whether or not they have special needs and many adults use one of the multiple scheduling programs that are available online. Special needs adults can also find programs that allow the schedules to include picture cues to assist in tasks and then allows them to complete the tasks in a timely manner regardless of their skill level in reading. There are few homes today that do not have a number of remote controlled devices and an adult with special needs home is no exception. Televisions, music systems, vacuums, window shades, lights, garage doors and thermostats are all examples of what can be controlled from a remote and many times from a smart phone application.

Smart phones, iPods and tablets have also become a technological medium for augmentative and alternative communication (AAC). This type of technology is used by many adults with moderate to severe language impairments as a way to allow them to communicate with the world around them (Cheslock, Barton-Hulsey, Romski, & Sevcik, 2008). It has long been thought that AAC devices would not be useful for adults who lack speech due to the perception that the adults are "too old to improve their language and communication skills" (Cheslock et al., 2008, p. 376). The authors debunk this idea through a case report. With the technological mediums of smart phones and tablets for AAC use, the opportunities and access to AAC software are becoming more extensive. As research emerges using the iPad it has been found that people that were thought to have a limited vocabulary and communication actually have an extensive vocabulary that they are just unable to express. When they are provided a medium to express their thoughts and feelings, they are able to do so very well, regardless of age or when the technology was introduced.

Smart phones and tablets also have the ability to assist adults with disabilities in learning life skills through computer-based instruction (CBI) and computer-based video instruction (CBVI). According to Ayres and Cihak (2010), this type of instruction can improve the acquisition of life skills. Ayres and Cihak set out to determine the advantages of using CBVI for specific life skills and focused on learning and generalization of the skills being taught. The authors determined that it is important that skills taught in this mode are functional for the learner to benefit (Ayres & Cihak, 2010).

As previously mentioned there is new research and anecdotal records being revealed daily on the impact of the iPad on the lives of people with special needs. USA Today (2011) notes that the reasons that the iPad is so successful with this population is because they are lightweight, mobile, can be easily tailored to the needs of the user and gives the sense that the user is "plugged in" to a greater community that is high tech and oblivious, many times, to their particular disabilities. The touch screen also makes using the iPad easier for those who struggle with fine motor skills and dexterity. The iPad is engaging and draws the user into its functions with vibrant colors and interactivity.

Walker (2011) states that there are 566,165 apps currently for the iOS (Apple operating system) and on average 775 new apps are submitted to Apple daily. He states that 15 billion apps have been downloaded from the Apple Store in the past three years. The most common apps are those in the gaming category, however, there are over 40,000 educational apps. When adding the reference tools, utilities, news and other apps that are commonly used in educational settings, the number exceeds 166,000 apps. It was in the midst of those numbers Walker began to formulate a rubric for the quick but accurate evaluation of apps for teachers. He determined from his research that there were six characteristics of an app that were important to teachers that he included in the rubric (Walker, 2011). They were a) curriculum connections, b) authenticity, c) feedback, d) differentiation, e) user friendliness and f) motivation. Under curriculum connections, the teachers wanted reinforcement of the topics of interest when the student is not engaged in direct instruction. They wanted some correlation to a targeted skill or concept that was being taught. The authenticity criterion addresses the quality of the experience for the learner using the app. Walker defined authenticity in terms of the engagement of the student in real learning problems that help them connect the theory to real life. The feedback given by the apps needed to be constructive and timely to the learner. Differentiation concerns the ability to target specific skills and tailor the level of difficulty for the particular learner. User friendliness was defined as the ease of use of the app

and the learning curve and support that was needed to effectively use the app. Finally, the last criterion is motivation. Does the app motivate the student to its use? A good app is of no use, he states, if the students are bored with it and do not use it. One interesting point that Walker makes is that price, in general, does not assist in the decision making process. There are good apps that are free and bad apps that are expensive.

Walker took these characteristics and needs and designed a rubric (Appendix A) to allow teachers to grade the apps that they currently use and to allow a standardized language so that teachers could communicate with each other about apps that work and those that do not. The rubric included the six domains described above and allowed ratings of 1-4 for each domain. He tested the rubric with teachers but has not been able to establish a cut score for an app. It is highly dependent on the user and the teacher's purpose for the app. He does state that he thinks most good apps score a "4" in at least four of the six categories. He has continued to gather data using this rubric. Permission was obtained from him to adapt his rubric to the particular needs of the adults with special needs population. (Appendix B) During the adaptation process, Walker's rubric was used as the base. Some domains were changed to better suit the needs of the special needs population as opposed to use in the classroom. In changing the domains, new scoring criteria had to be adapted to match the new domains and to better suit the population.

The long-term goal is that functionality and independence can be achieved for adults with disabilities using apps on devices such as smart phones and tablets. This pilot study will prepare for a larger study that will determine if the rubric created will assist parents and siblings as well as other caregivers choose apps that will allow the adult with special needs to function in a more independent environment. The final outcome is that the rubric will be used on a web based site that is available to the public to assist them in making choices on hardware and apps that will allow their adults to reach their fullest potential.

Methodology

This study was submitted and approved by the Institutional Review Board for Human Subjects. The participants included 10 adults who were either parents or siblings of an adult with varying degrees of special needs. Participants were selected using a combination of purposive and convenience sampling. They were asked to participate in the study and their willingness to complete the evaluation form implied consent. The adults were required to speak English and be of sufficient technological savvy to manipulate through the apps. The researchers provided the hardware and the apps and were available to the participant during the evaluation period if

assistance was necessary. The participants were asked to evaluate six different apps using the evaluation tool created by the researchers (Appendix C). They were provided with a form to complete ratings on each app, scoring the app in each domain, and then answering a few short answer questions about the usefulness of the app and the tool. (Appendix D) The apps that were evaluated included the following: Counting money, Proloquo2go, iDress, Tap to Talk, Touch and Learn, and Telling Time. Two of the apps are alternative and augmentative communication apps (Proloquo2go and Tap to Talk). The rest of the apps are aimed at activities of daily living. The entire evaluation period for the participant averaged 15-20 minutes. The completed evaluations were anonymous with no personal information or identifying factors.

The evaluation forms were compiled and the comments examined for content and themes. Also, the scores on the apps were compiled, averaged, and evaluated against the scores that the research team hypothesized they would receive. For example, the research team hypothesizes that Proloquo2go will score highly with those adults that have communication issues but may show weakness in application and cost.

Results

Table 1 depicts the average scores of the evaluated apps. A total of ten participants completed the worksheet (Appendix D). Among the participants, four were siblings, five were parents, and one caregiver of adults with special needs. Table 1 depicts the averages of the scores collected for each app and respective domain. The scoring range for each domain ranges from 1-4. Higher average scores depict positive feedback for that specific app and domain. The individual scores for the apps were as follows: Counting Money ranged from 2.4-3.8 with an average of 2.86, Proloquo2Go scores ranged from 1.6-2.7 with an average of 2.34, Touch and Learn scores ranged from 1.7-2.8 with an average of 2.4, iDress for Weather scores ranged from 1.9-3.2 with an average of 2.67, Telling Time scores ranged from 2.3-3.2 with an average score of 2.65, and TaptoTalk scores ranged from 2.4-3.0 with an average score of 2.58.

With regard to the short answer question portion of the worksheet, the results were as follows: 100% of respondents answered “Yes” to the question “Do you think any of these apps would be helpful to your adults?”; 80% of respondents answered “Yes” to the question “Do you think that your adult could use any of these apps?”; 89% of respondents answered “Yes” to the question “Do you think other adults that you know would benefit from these apps?”; 100% of respondents answered “Yes” to the question “Do the apps seem applicable to you for use with adults with special needs?”; 88% of respondents answered “No” to the question “Are you aware of

any other apps we should investigate?"; 80% of respondents answered "Yes" to the question "Do you or someone in your family own an iPad or iPod?"; and 80% of respondents answered "Yes" to the question "Do you think this tool adequately evaluated the apps and gives you the information you would need to make a decision on the app's use for your adult?".

Discussion

The overall scores showed a very positive outlook on the use of apps for this population. As expected, cost did play a factor with less expensive apps scoring much higher in the "Cost" domain than the more expensive apps. It was anticipated that Touch and Learn would be a low scoring app and indeed it had one of the lower average scores. iDress for Weather scored lower than was anticipated, however, when examined more closely, it scored higher than 3 in three domains. This is Walker's criteria for a good app. This would support the hypothesis that this app would be useful for this population. It would also appear that the feedback domain may be the least useful. It was not applicable in the AAC apps and scored low in the iDress app but should not have been seen as a fault in the app.

The responses to the short answer questions identified that most felt that adults with special needs could benefit from apps such as those used in this study. However, very few of the participants were aware of any other apps for use in this population, indicated the limited use of this technology in this population. One person noted that had this technology been available for his sibling when it was younger it would have been helpful, but now he has dementia and it was doubtful that he could use the technology. Most of the families did have access to devices that could use these applications, so for most, the purchase of a device to run an app is not an issue. There was concern by participants that this tool may not be appropriate for AAC apps and that different domains may need to be established for communication apps. From the information gathered and the responses to the questions on the questionnaire (Appendix D), it can be concluded that the evaluation tool is useful and beneficial for the adults with special needs population, but does need further adaptation and testing. This study also demonstrated that many families have the technology available but are unaware of apps that would potentially assist their adults.

Conclusion

It can be concluded that this evaluation tool can be utilized effectively by care providers, but needs to be further adapted. A larger sample size will be used in the following study as well as including adults with special needs to participate.

Initial dissemination of apps, such as iDress, has already been achieved on a Facebook site developed for the Adults with Down Syndrome Specialty Clinic at The University of Kansas Medical Center.

This pilot study, however, has established the need for this information for families and adults with special needs and for a tool to assist families in these decisions.

Table 1

Domain	Counting Money	ProLoQuo	Teach & Learn	iDress	Telling Time	TaptoTalk
Application	2.8	2.5	2.5	2.5	2.5	2.5
Feedback	2.6	N/A	2.8	1.9	2.7	N/A
Adjustability	2.7	2.4	1.7	2.3	2.3	2.6
Ease of Use	2.4	2.7	2.4	3.0	2.5	2.4
Cost	3.8	1.6	2.8	3.2	3.2	3.0
Benefits	2.9	2.5	2.2	3.1	2.7	2.4
Total Average	2.87	2.34	2.4	2.67	2.65	2.58

*Costs: Counting Money $0.99, Proloquo2Go $189.99, Touch & Learn Free, iDress for Weather $1.99, Telling Time $0.99, TaptoTalk $39.95

Appendix A Evaluation rubric for IPod apps (Walker, 2010)

Evaluation Rubric for IPod Apps

Domain	1	2	3	4
Curriculum Connection	Skill(s) reinforced in the app are not clearly connected to the targeted skill or concept	Skill(s) reinforced are prerequisite or foundation skills for the targeted skill or concept	Skill(s) reinforced are related to the targeted skill or concept	Skill(s) reinforced are strongly connected to the targeted skill or concept
Authenticity	Skills are practiced in a rote or isolated fashion (e.g., flashcards)	Skills are practiced in a contrived game/simulation format	Some aspects of the app are presented an authentic learning environment	Targeted skills are practiced in an authentic format/problem-based learning environment
Feedback	Feedback is limited to correctness of student responses	Feedback is limited to correctness of student responses and may allow for student to try again	Feedback is specific and results in improved student performance (may include tutorial aids)	Feedback is specific and results in improved student performance; Data is available electronically to student and teacher
Differentiation	App offers no flexibility (settings cannot be altered)	App offers limited flexibility (e.g., few levels such as easy, medium, hard)	App offers more than one degree of flexibility to adjust settings to meet student needs	App offers complete flexibility to alter settings to meet student needs
User Friendliness	Students need constant teacher supervision in order to use the app	Students need to have the teacher review how to the use the app on more than one occasion	Students need to have the teacher review how to the use the app	Students can launch and navigate within the app independently
Student Motivation	Students avoid the use of the app or complain when the app is assigned by the teacher	Students view the app as "more schoolwork" and may be off-task when directed by the teacher to use the app	Students will use the app as directed by the teacher	Students are highly motivated to use the app and select it as their first choice from a selection of related choices of apps

http://learninginhand.com/storage/blog/AppRubric.pdf
Created by Harry Walker – Johns Hopkins University
10/18/2010
Please contact for permission to use hwalker@bcps.org

Appendix B Email correspondance with Harry Walker seeking permission to adapt rubric

From: Moya Peterson [mailto:MPETERSO@kumc.edu]

Sent: Thursday, February 09, 2012 5:38 PM

To: Walker, Harry C.

Subject: your evaluation for iPod apps

Sir- I am an assistant professor at the University of Kansas School of Nursing and School of Medicine. I have established an Adults with Down Syndrome Specialty Clinic. A student and myself are attempting to find and evaluate apps on the iPad and iPod touches that my patients would benefit from as well as be able to inform parents and other providers of apps that are established that could assist them in their activities of daily living. We have used your evaluation tool as a pattern but have changed it somewhat to fit our particular needs. I have attached this tool to this email. I just wanted to make sure that we had your permission to do this. We were thrilled to find your tool, as there is very little in the literature about this. We thought it valuable and it provided the only suggestion to develop the tool that we wanted.

Please feel free to email me any questions you may have. Thank you for consideration of this matter. We will be anxious to hear back from you.

Moya Peterson, PhD, APRN

From: Harry Walker

Sent: 2/10/2012 10:15:22 AM

To: Moya Peterson

Hi Moya,

I'm glad you found the rubric to be useful. You have permission to use the rubric as described in your email. I will likely be in touch sometime in the coming month to ask for formalized feedback as part of my dissertation research at Johns Hopkins. I hope you will be able to participate. Best of luck in your efforts to get mobile devices in the hands of your patients.

You might also want to check out our blog - http://iteachthererforeipod.blogspot.com It has resources, articles, etc., related to IPods, Mobile 1 to1 and BYOT. Feel free to share with like minded folks. There is also a link to an article I wrote for the Journal of Special Education Technology about the rubric. The background material may help in your work.

Regards,

Harry Walker

Appendix C Evaluation of Application

Evaluation of Applications

Domain	1	2	3	4
Application	Skills in the app are not applicable to individual's needs	Skills in the app are somewhat applicable to individual's needs	Skills in the app are adequately applicable to individual's needs	Skills in the app are very applicable to individual's needs
Feedback	No feedback is provided in the app	Feedback is only given regarding correctness of response	Feedback gives correctness of response and allows individual to try again	Feedback given is constructive and contributes to improvement of the task
Adjustability	App settings are not adjustable to individual's needs*	App settings are somewhat adjustable to meet individual's needs	App setting are adequately adjustable to meet individual's needs	App is very adjustable to meet individual's needs
Ease of Use	Individual needs maximum (step-by-step) instruction to use app	Individual needs moderate amount of instruction to use app	Individual needs minimal amount of instruction to use app	Individual needs no instruction to use app
Cost	Cost of app largely outweighs benefit of use	Cost of app somewhat outweighs benefit of use	Cost of app is equal to benefit of use	Benefit of use largely outweighs cost of app
Benefits	App provides no benefit to individual's daily life	App provides minimal benefit to individual's daily life	App provides some benefit to individual's daily life	App provides large benefits to individual's daily life

11/13/11

*Examples of needs include: larger fonts, volume control, larger graphics, difficulty levels, etc

Appendix D Questionnaire

1. Please score each app in each domain using the rubric attached.

DOMAIN/APP	Counting Money	Proloquo2go	Teach and Learn	iDress	Telling Time	TapToTalk
Application						
Feedback						
Adjustability						
Ease of Use						
Cost						
Benefits						

2. Do you think any of these apps would be helpful to your adult?

3. Do you think that your adult could use any of these apps?

4. Do you think other adults that you know would benefit from these apps? How?

5. Do the apps seem applicable to you for use with adults with special needs?

6. Are you aware of any other apps we should investigate?

7. Do you or someone in your family own an iPad or iPod? If no, have you thought about the purchase of one or such technology that is similar?

8. Do you think that this tool adequately evaluates the app and gives you the information you would need to make a decision on the app's use for your adult?

References

Ayres, K., Cihak, D. (June, 2010). Computer- and video-based instruction of food-preparation skills: acquisition, generalization, and maintenance. *Intellectual and Developmental Disabilities*, *48*(3), 195-208. Retrieved from http://www.aaiddjournals.org.proxy.kumc.edu:2048/doi/full/10.1352/1944-7558-48.3.195

Cheslock, M.A., Barton-Hulsey, A., Romski, M., Sevcik, R.A. (October, 2010). Using a speech-generating device to enhance communicative abilities for an adult with moderate intellectual disability. *Intellectual and Developmental Disabilities*, *46*(5), 376-386. Retrieved from http://www.aaiddjournals.org.proxy.kumc.edu:2048/doi/abs/10.1352/2008.46%3A376-386

Storey, K. (December, 2010). Smart houses and smart technology: Overview and implications for independent living and supported living services. *Intellectual and Developmental Disabilities*, *48*(6), 464-469. Retrieved from http://www.aaiddjournals.org.proxy.kumc.edu:2048/doi/abs/10.1352/1934-9556-48.6.464

Walker, H. (2011). Evaluating the effectiveness of apps for mobile devices. *Journal of Special Education Technology*, 26(4). 59-66.

Williams Boyd, A. (2011, September 11). Adapting to the iPad, called education's 'equalizer'. *USATODAY.* Retrieved from http://yourlife.usatoday.com/parenting-family/special-needs/story/2011-09-11/Adapting-to-the-iPad-called-educations-equalizer/50362426/1