

Building on What We Know: The iPad as an Assistive Technology Tool for Post- Secondary Students with Disabilities

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Abstract

With the emergence of the first iPad on the market, educators of students with special needs in primary and secondary schools have been interested in the device as an assistive technology tool, particularly for students with Autism Spectrum Disorder and developmental disabilities. In the last few years, this interest has extended to educators in post-secondary institutions. This is due to the fact that, the iPad may offer significant opportunities to assist students with disabilities in their learning. The iPad with its provision of accessibility supports and available multifunction apps may be an important course accommodation for students with disabilities. The use of the iPad with post-secondary students with disabilities is somewhat untried and unstudied in the post-secondary academic environment. This study examined the use of the iPad by eight post-secondary students with disabilities studying at a distance. How the students used the iPad, the apps they used and did not use, the difficulties they experienced, and the supports that they required, were all documented throughout their completion of one course.

Keywords

iPad, post-secondary students, assistive technology, learning, apps

Introduction

With the emergence of the first iPad on the market, educators of students with special needs in primary and secondary schools have been interested in the device as an assistive technology tool, particularly for students with Autism Spectrum Disorder and developmental disabilities. In the last few years, this interest has extended to educators in post-secondary institutions. This is due to the fact that the iPad may offer significant opportunities to assist students with disabilities in their learning. For example, the iPad has a number of built-in features such as “speech select” that could help students with reading difficulties access their course reading materials. A wide range of applications are available for use that can offer functions such as annotation and word prediction that many students require as accommodations for learning. There are also apps where students can change the font size, brightness, and background to adjust for their reading needs.

Several studies in the literature have examined the use of iPads with post-secondary students. Rossing, Miller, Cecil, Stamper (15) found that post-secondary students had a positive perception of their iPad use in class. The iPad aided in group collaboration activities and students had increased attention to class material while using the iPads. The students also reported that they could participate in class in ways that enhanced learning (Rossing et al. 16). Eichenlaub et al. (19) found that students needed time to learn to use the device but reported that students benefitted academically from using the iPads. Students reported that the iPad facilitated their workflow making them paperless with more effective time management. Geist (758) explored the use of iBooks on iPads with students, and found that students liked using iBooks for course work and appreciated the convenience it afforded. Bush and Cameron (xvi), in a pilot program in three master’s level college courses, found that the majority of students perceived

electronic course materials on an iPad in the app, *iAnnotate*, to be as good as or better than printed course materials. Mang and Wardley (50) explored the academic uses for a tablet including reading text, conducting research, completing assessments, social interaction, and note taking. Ninety-six percent of the student participants felt that the iPad tablet had enhanced their learning, and ninety-two percent indicated that they would like to use the tool in future courses.

Although there is a growing body of evidence regarding iPad use by post-secondary students, there are few studies that examine the impact and use of the iPad with post-secondary students with disabilities. In one of the few studies that included students with disabilities, Nee (vii) reported that students with learning disabilities indicated that the use of e-texts helped to improve their academic work, which resulted in increased self-esteem and self-confidence. Henderson, Gibson, and Forbes (73) looked at the impact of tablet computers on students with a range of disabilities who used iPads for a 3 week period. The students reported they liked the size, weight and portability of the devices and found the iPads engaging and useful as they engaged with their academic environment. Chmiliar and Anton (599) in a pilot study with two post-secondary students with disabilities, found that the students actively engaged in the use of the iPad throughout their course. Both students reported that the iPad had significant positive impact on their learning and were looking to continue using the device past the conclusion of the study.

The use of the iPad with post-secondary students with disabilities is somewhat untried and unstudied in the post-secondary academic environment. The iPad with its provision of accessibility supports and available multifunction apps may be an important course accommodation for students with disabilities. This study examined the use of the iPad by eight post-secondary students with disabilities studying at a distance. How the students used the iPad,

the apps they used and did not use, the difficulties they experienced, and the supports that they required were all documented throughout their completion of one course.

Methodology

This research project followed a Participatory Action Research (PAR) model. This type of research focuses on co-developing a research program with people rather than for people. The student participants were involved in the research process from the beginning of the project, through the data gathering and analysis, to the final conclusions. It is a systematic inquiry, with the collaboration of those affected by the issue being studied for the purpose of education and taking action or effecting change. As such, the participants in this PAR, were eight students with disabilities who were receiving support for their learning in their post-secondary distance course. These students were involved in the research right from the beginning of the project, each month during team meetings, and at the conclusion.

Prior to receiving the iPad for use in their studies, each student participated in a meeting with a member of the research team where they discussed their learning needs and identified possible apps that might support them in their learning while studying for the course. Each student received an iPad to use for the course that was loaded with their course materials in an accessible format, and the apps that they helped to select. Short video training clips and documentation on how to use the iPad and the apps were provided to students on request. Each student met with the researchers once a month to review how the student was using the iPad and the apps. Any problems or issues were addressed during the meetings, and the team worked together to map out a plan to maximize the success of the student with the device. Training and support on specific apps were provided as necessary, and the students were also provided with

suggestions on additional apps that could be used to support their learning needs. Additional apps could be downloaded by the student or “pushed” out to the student using *Meraki* software.

The data collection for this qualitative study primarily involved pre and post interviews with the students, and field notes from each meeting with each student. The data for each student experience was organized topically to see: how the student used the iPad, if the iPad, the course materials on the iPad, and the apps helped to support the student in their course work; what issues arose and how they were addressed; and what kinds of supports the students needed to use this tool effectively in their studies.

Results

The participants included 1 male and 7 female students with an age range of 31 to 56 years. All of the participants were registered in and completing at least one post-secondary course by distance (see table 1).

Table 1. Student Information

Student	Age	Disability	Technology Owned	Apps Most Used
1	31	Learning disability, psychiatric disability	iPhone4, Kindle, desktop PC, laptop	<i>Voice Dream</i> <i>iStudiez Pro</i> <i>Flashcards Deluxe</i> <i>Inkflow</i> <i>Dropbox</i>
2	55	Learning disability, attention	iPad Air2, iPad mini, iPhone5	<i>iStudiez Pro</i> <i>GoodReader</i> <i>Focus Time</i> <i>Mental Case</i> <i>EndNote</i> <i>YouTube</i>
3	33	Learning disability, attention	Smart phone, desktop PC	Tried some apps but did not integrate use into learning for course

Student	Age	Disability	Technology Owned	Apps Most Used
4	55	Fibromyalgia, asthma, neurological condition, pain	Smart phone, desktop PC	<i>Educreations Evernote Audionote Notability</i>
5	44	Learning disability	Desktop PC, iPhone	<i>Pages Flashcards Deluxe AnkiApp Voice Dream iStudiez Pro</i>
6	40	Psychiatric disability	Desktop PC, laptop	<i>YouTube Safari Anxiety Free Dictionary.com Voice Dream iStudiez Pro Pages</i>
7	56	PTSD	Laptop, iPhone 5	<i>Voice Dream Inspiration iStudiez Pro Dictionary.com Dropbox</i>
8	48	Head Injury, pain	Laptop, iPhone 4	<i>ClaroPDF ClaroSpeak Voice Dream iAnnotate PDF Dropbox EasyBib iStudiez Pro</i>

Motivation for Participation

The students participating in this research all volunteered to participate for a number of reasons. One student reported that she felt a technology change was coming at the post-secondary level and felt that participation in the study might help her to be prepared. Several of the students indicated that they were either thinking of buying an iPad or had already bought one. They had a desire to learn how to use the device for learning, or in the case of Student 2, wanted

to make more efficient and better use of the device. Another student was looking forward to the portability of the device, and still another was looking for anything that would accommodate her learning needs and make it “easier.”

Apps Used

As indicated in Table 1, each student in the study reported app usage that was quite individual. Students initially chose apps for the iPad that would meet their specific learning needs. Additional apps were added by students or “pushed” to the student, based on their specific learning needs and the types of tasks they were required to complete in the course. For example, Student 1 added the use of *Flashcards Deluxe* to study for multiple choice questions part way through the course. Several students also added the use of the *Dropbox* as they progressed through the course, discovering its utility in sharing documents between devices. Conversely, students also stopped using specific apps when they were not long useful to them. Student 6 indicated that she stopped using the app *Anxiety Free* as she no longer needed to use the app due to reduced anxiety while using the iPad. Students used the apps for a range of learning activities including: reading, planning, organization, writing, note taking, studying, focusing attention, reducing anxiety, and comprehension of course content.

Several apps were consistently used by a number of students. These apps typically provided functionally for the students, were quick and easy to figure out how to use, and supported each student in a specific way to meet their needs. Table 1 identifies the apps most commonly used by each student. There is some overlap in app use and it is noted that the apps like *iStudiez Pro*, *Voice Dream*, *Dropbox*, and *Flashcards Deluxe* were used by several students. However, there is considerable variability from student to student. In fact, on several instances an app really liked by one or more students, was really disliked by another. For example a

number of students indicated that they really liked the *Voice Dream* app, one student did not like the *Voice Dream* app at all, preferring *GoodReader* instead.

Apps Not Used

A number of apps were not used by the participants primarily because they did not have need of those apps in the course assignments, or the app did not support a specific individual learning need. For example, students in courses that had no writing tasks did not try apps that supported writing. Other apps were not used because the students identified them as taking too much time and energy to learn. If a student could not figure out how to use the app right away, or had to go through a complicated process to set up an account, they typically did not progress further with its use. Another feature that several students did not like, was having to create an account or password to use the app. Finally, some students were looking for apps that could help them accomplish what they currently do on paper. If the app did not provide them with access to strategies they typically use, they were not interested in trying it further.

Training Required

A range of training needs were demonstrated by the participants. Some students were familiar with the iOS operating system and adjusted a little more quickly to the use of the iPad and the apps. Several students with no previous experience needed considerably more support to get started on the iPad. Several students needed instructions on how to get started with the iPad. One student indicated that she needed basic instructions on how to access and use the basic functions in specific apps. The learning needs changed as time progressed to needing information on more sophisticated tasks such as how to save work completed in several different apps and how to share or print the work that they had created.

Overall Impressions of the iPad

Overall, the majority of the students had very strong opinions about the use of the iPad. They liked the portability of the device, and reported using the device at the hospital, at hockey games, at work, and listening in the car. Several students also talked about the comfort they experienced in using this device compared to working at a computer or laptop. This was particularly important for students who experienced pain, who needed to sit in comfortable settings or change their position frequently. Two students indicated that using the iPad reduced their anxiety about working on a computer. Student 2 reported that using the iOS system is intuitive. “I don’t need to struggle to read instructions on how to use stuff.”

Very few negative comments regarding use of the iPad emerged in the interview and team meetings. Two of the students felt that working on the iPad was not good for long essays or papers, however these students had not worked with apps at that time that could support writing. One student indicated that the small screen size was an issue when working on some types of tasks. Several students experienced app specific difficulties in that they were not certain how to “save” their work on the iPad. Several students also struggled with the idea that the iPad could share documents with other devices or send to print. One student tried a number of apps, but did not integrate use of the iPad into her study routines. She felt that she was more comfortable with using pencil and paper and that using the iPad was considerably more work.

Discussion and Conclusions

All of the students in this research study volunteered, and all indicated an interest in looking at the iPad as a learning tool. All but one of the students found apps that met their learning needs and integrated the use of the iPad into their course learning. Involving students in the process identifying their specific learning needs and matching these needs with specific apps

lead to significant engagement with the iPad right from the beginning of the study. This cut down on wasted time and discouragement for the student as they did not have to try apps that would not work for them or meet their learning needs.

There is a need to offer post-secondary students with disabilities access to a number of different apps that are designed to meet their learning needs. Each student has very individual preferences and learning needs differ. Assignment and reading demands also differed substantially from course to course. This access to app information needs to be offered on a continuous basis, as students evolve to needing and using different types of apps over time. A one-size-fits-all approach is not appropriate for matching apps to student needs.

The majority of students needed support and training to use the iPad and apps effectively for learning. Some needed basic training on how to use the iPad, several just needed directions on how to use specific apps, and several students required more advanced support in terms of how to use *Dropbox* to share documents. If iPads are to be successfully deployed and used by students with disabilities to support their learning, it is essential that a range of training and support be provided.

So, can the iPad be considered as an assistive technology tool for post-secondary students with disabilities? As previously indicated, the students used apps on the iPad to support their learning in a number of areas including: reading, planning, organization, writing, note taking, studying, focusing attention, reducing anxiety, and comprehension of course content. Here is what some of the students had to say. Student 1 said, “The difference it makes in my abilities is surprising.” This student felt that her capacity to work had increased so much that she felt that she had limited herself without one. Student 2 reported that “some of the apps, I would say, have been life-changing.” Student 4 commented “the more I can do on the iPad, the happier I am.”

Student 8 said, “It’s helped me psychologically. It gave me confidence. Much more confidence than I had before.”

The results of this study were very positive and indicate the possibilities that this device might have for post-secondary students with disabilities. However a limitation of this study is the small number of participants in the study. Nonetheless, it was evident, that for the majority of the students in this study, the iPad was an excellent assistive technology tool.

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