

An Introduction to Mobile Apps for K-12 Students with Special Needs: An Instructional Website for Educational Technology Students

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Abstract: Mobile learning is a huge trend in delivering educational content. K-12 institutions are seeing the affordances that mobile learning provides, such as increased engagement and enhanced communication. This is especially important for delivery of education to students with special needs, who directly benefit from the enhanced communication. Many Educational Technology (ETEC) students are teachers, or going to be teachers, at K-12 institutions. Therefore, the purpose of this Instructional Design (ID) project is to develop and evaluate a website introducing University of Hawaii at Manoa ETEC graduate students to selected mobile applications for K-12 students with special needs. This ID project used demographic and attitudinal surveys to test student perceptions of the use of mobile technologies in the K-12 classroom. Selected mobile apps for the hearing and speech impaired were reviewed. After participating in the learning module, most felt comfortable using these apps for students with special needs. Survey results were favorable to the use of mobile technology for K-12 instruction. Among ETEC students, the use of mobile technologies in K-12 education is highly regarded. This study indicates that the use of mobile technologies in K-12 education is no longer a trend, but is vastly becoming a common educational practice.

Introduction

Using technology for instructional purposes is nothing new. For years now we have used personal computers and laptops in the classroom. We now find ourselves in the age of mobile devices, such as portable media players, tablets, and smart phones. One cannot imagine leaving home without our favorite tablet or smartphone in hand. Educators are now starting to see the educational affordances of such devices. In the area of teaching students with special needs, educators are applying the use of these technologies as well. Many graduate level Educational Technology (ETEC) students are teachers themselves, or are going to be Technology Integrators in K-12 institutions. Special education and students with special needs is an important part of any primary or secondary school's curriculum. Therefore, the purpose of this Instructional Design (ID) project is to develop and evaluate a website introducing University of Hawaii at Manoa ETEC graduate students to selected mobile applications for K12 students with special needs.

During the Fall-2012 Semester Dr. Min-Feng Lin taught an ETEC graduate level course called ETEC-647 Emerging Technologies – Mobile Applications. It was from this course that the inspiration for this project came from. The use of mobile technology in education just seemed to be fascinating. Dr. Lin also taught ETEC-442 – Computers in Education, which also incorporated lessons on mobile learning, and provided examples of using this technology for students with special needs. In an ETEC-647 project, my partner Grant Chartrand and I designed a prototype for this ID project in the form of an iBook that contained the mobile application reviews included in this learning module. A small literature review was conducted, various mobile applications were researched, and a rubric was designed to evaluate these applications. At the end of the semester we presented the iBook in a class presentation. The concept of this project started out as a simple resource website for ETEC students wanting to learn more about mobile apps for students with special needs. With much discussion throughout the development of the prototype, the project transformed into the Instructional Design module we have today.

Review of Literature

Ubiquitous computing, computing embedded in everyday life, is becoming the vehicle to integrating mobile technologies into the standard K-12 curriculum. Mobile technologies are ubiquitous amongst K-12 students. It seems like every student has a cell phone, and access to tablets such as iPads is on the rise as well. In the past schools banned the use of electronic devices such as MP3 players, and cell phones as distractive and detrimental to learning (Barrimentos, 2010). Now many educators are excited to implement the usage of such technologies as they provide many affordances such as the ubiquity of such devices and the increased mobility of educational content (Lin, Fulford, Ho, Iyoda & Akerman, 2012). According to Lin et al. (2012), benefits to students also include “increased engagement, motivation, achievement, and enthusiasm for learning, and enhanced student understanding” (p. 132).

Devices such as the iPod Touch and the iPhone are robust in the kinds of Mobile Applications (Apps) they can provide, including education apps. As compared to personal computers and laptops, these devices are portable, inexpensive, and durable (Banister, 2010). According to Banister (2010), these devices provide a valuable learning tool that can be used at home, at the bus stop, and at school (p. 122). This technology affords the student the benefit of taking learning where ever they go. Tablets, for instance, “allow for individualized learning, facilitate enhanced communication and make learning mobile” (Udell).

Beyond Mobile Learning (ML) there exists a need to address ML for students with special needs. Educators should not randomly pick mobile applications that might benefit students with special needs; there exists a need to develop a mobile learning initiative for special education (Purpas, 2011). School districts need to plan out a strategy for implementing ML for students with special needs (Purpas, 2011).

Methods

Target Audience of the Instructional Module

The intended audience of this Instructional Design (ID) website were ETEC students at the University of Hawaii at Manoa's Department of Educational Technology. Test subjects included students in the three sections of ETEC-687/690, as well ETEC-442, an undergraduate Computers in Education course. Many of the students both in the ETEC graduate program as well as ETEC-442 course are or will be teachers or Technology Integrators at K-12 institutions.

Module Development and Design

The ID learning module was implemented online via a Weebly.com website, and designed using the ARCS Model of Motivation (Keller). The content included an educational theory section covering Bloom's Taxonomy and Gagne's Nine Events of Instruction. These educational theories were covered to give the participants a frame of reference, or lens, in which to view the applicability of the mobile apps being reviewed. The apps were categorized by hearing impaired, and speech and communicative impaired disabilities. The learning module was designed take a learner about an hour to complete, and provided resources and links so they could further investigate the subject matter on their own.

Data Collection

Data was collected from participants using a demographic survey at the start of the learning module and an attitudinal survey at the end of the learning module. These surveys assessed the affective domain, that is, the learner's perceptions about the use of mobile technologies for teaching students with special needs in the K-12 classroom. Question formats included Likert scale and open-ended questions. The data was summarized in a report of findings that include quantitative and qualitative analysis, listed in the results section below. This project took place in ETEC-687 (Fall 2012) and ETEC-690 (Spring 2013). Results of this project will be presented at the annual on-line TCC conference on April 16, 2013.

Results

There were a total of twelve participants in this study. All twelve participants completed both the demographic and attitudinal surveys. And, all twelve participants left substantive and relevant comments in the open-ended text based questions. Seven participants were female and five were male. Their ages ranged anywhere from the 18-21 age range all the way to 61 or over, with the ages evenly distributed among all age groups. Most participants had either a 4-year college degree or a Master's degree. One participant had PhD and one had a MD/JD professional degree.

When asked what type of Mobile Technology they used (Cell Phone, Smartphone, Laptop, Tablet) most participants said they used three or all four of the devices listed.

When asked what was their comfort level when using mobile technology in the classroom or instruction, eleven out of the twelve answered comfortable or very comfortable. Most participants thought the learning module was easy to understand, that the level of difficulty was easy to understand, and the length of the learning module was just about right for them. All three of these categories earned high marks in the Likert scale, see Figure 1 – Module Usability Data below.

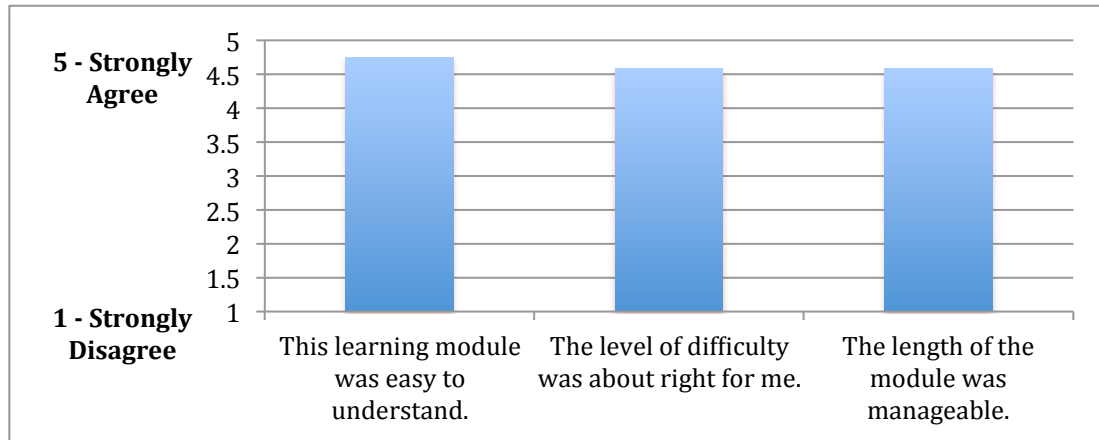


Figure 1 - Module Usability Data

The next section of the attitudinal survey dealt with aspects of the mobile apps themselves. Were the mobile apps reviews helpful with respect to teaching students with special needs? How much was the perceived learning by the participant about these apps? Did the learning module make it easier for participants to integrate these mobile apps in a classroom setting? And, after completing the learning module did participants feel more confident in their knowledge of mobile applications for student with special needs? Overall these questions earned high marks from participants, see Figure 2 – Perception of Mobile Apps reviewed below.

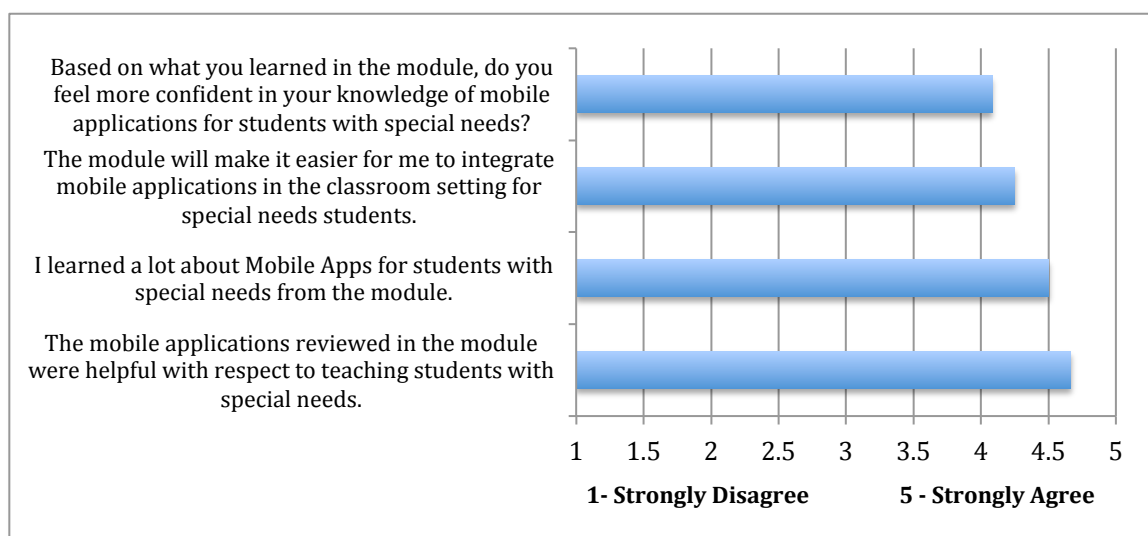


Figure 2 - Perception of Mobile Apps Reviewed

Implications

This learning module proved to be highly relevant to Educational Technology (ETEC) students. In the demographic survey taken prior to the start of the learning module, *only* two participants reported being familiar with Mobile Apps for students with special needs. Four participants reported being somewhat familiar, but five participants reported they were not at all familiar with these apps. Many of these ETEC students work, or will work, in K-12 institutions as teachers or Technology Coordinators. The next generation of K-12 faculty and staff need to be well versed in the use of these mobile applications and mobile learning in general.

It is clear from the data that the participants had a favorable attitude towards the use of mobile applications in their instruction or classrooms. Nine out of the twelve participants were somewhat likely or very likely to use mobile apps for instruction in the classroom. After completing the learning module, participants reported being more confident in the use of mobile apps for students with special needs in their classrooms as well.

As suggested in the literature review, past resistance to allowing the use of mobile technology in the classroom exists. Over time, the trend is now more accepting of using mobile technology for K-12 instruction. One study participant said “I am an administrator in a K-12 public school system and I encourage the use of mobile devices in the classroom.” Another participant said “I think it’ll be the norm in a few years and the use of their familiar mobile devices will be motivational.” And another participant said “I really enjoyed this module. It provided me as an educator with the knowledge of the ways we can use these tools positively to assist students with special needs. It also more importantly inspired me to want to learn more.”

Most participant comments were favorable to the use of mobile technology in the classroom; however, some of the comments were also cautionary in nature. One participant said “All for it, as long as you have a way to keep them (the students) on track.” Another comment suggested that the use of “these devices be monitored to ensure they are being used for academic purposes.”

The development of this learning module proved to be a valuable learning experience. The apps themselves were so numerous that it was impossible to review and evaluate all the applications available. Instead, a few relevant applications in each area were selected. One criterion was the platform. Due to limitations of available mobile devices it was decided to evaluate Mac based OS X applications for the iPad and iPhone. Another criterion was the cost of the applications themselves. Free or inexpensive applications were chosen because they would be easy for K-12 teachers, and their students to acquire. Also, as graduate student researchers, there was not the funding purchase multiple higher end applications. However, a special thank you needs to be given to Mr. Ted Conley, the author of TapSpeak Choice. Mr. Conley developed the app so he could help his son who had autism. The app looked interesting but the cost was \$149.00. Mr. Conley was gracious enough to give us a copy of his entire suite of applications at no cost for this project.

Conclusion

This study only scratches the surface of mobile apps for students with special needs. Enhancements could include evaluating apps for autistic students and apps for other Windows based mobile devices. This project could also develop into a comprehensive web based resource that evaluates additional categories of mobile apps for students with special needs.

While stakeholders in K-12 education are not one hundred percent sold on the efficacy of using mobile devices in the classroom, one cannot deny the overwhelming trend towards its widespread use in education. As the next generation of K-12 teachers, support staff and Instructional Designers, ETEC students are a bellwether for the future of technology in education. In this regard, the use of mobile technologies in K-12 education is no longer a trend, but is vastly becoming a common educational practice.

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