

***iPads and Autism:
Using iPads for Autism and the Effects of that on Learning Methods***

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Abstract

The purpose of this study is to grasp the opportunity of utilizing technology like iPads for autistic students. This is a study to prove that technology is not an optional tool in learning but that it becomes an essential tool to teach and provide information and enhance academic skills for students. In 2012, the research at the Centers for Disease Control and Prevention (CDC) estimated that 1 in 88 children in the United States has been identified with Autism Spectrum Disorder (ASD). In 2014, the number of diagnosed children increased by 30 percent to 1 in 68 children. So, because of the increasing number we have to find new learning methods. Technology has allowed us to have different ways of learning for people with disabilities. Also, it is a gateway to improve their skills, especially in academic, social and communication skills. The study applied to 33 students at the Jeddah Autism Center to enhance academic skills. The first phase of this study started by distributing a survey for the families of autistic people to know if they use technology at home with their children or not. Next, teachers made a technical file for each student and started using iPads in a computer lab by giving them tasks according to the educational plan for each student. The results were divided into two groups: 27 students accepted iPads, they performed given tasks, and six students were not interested and refused to use it.

Keywords: Autism, Technology, Learning methods, Disabilities.

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Introduction

Autism spectrum disorder (ASD) is defined as a complex developmental disability. This disorder is characterized in varying degrees of difficulties in social skills, linguistics, behavior and sensory impairment, including difficulties with social and emotional responsiveness. In 2012, the research at the Centers for Disease Control and Prevention (CDC) estimated that 1 in 88 children in the United States has been identified with Autism Spectrum Disorder (ASD). In 2014, the number of diagnosed children increased by 30 percent to 1 in 68 children. So, because of the increasing number we have to find new learning methods. Technology has allowed us to have different ways of learning for people with disabilities. Also, it is a gateway to improve their skills, especially in academic, social and communication skills. Interactive technology such as iPads are considered to be assistive technology for students with ASD. Autistic people can use technology to enhance many aspects like academic, communication, and transitioning skills. Only a few researchers are talking about technology and autism. Autistic children like any other healthy students need to use technology to improve the educational process (Brown, 2016). Interactive technology such as iPads play a role in increasing participation of students with disabilities (Rodríguez et al, 2013). Malley et al. (2014) found that iPads improved math skills for six students to 100 percent in performance. Also, a systematic review illustrated positive results with an iPad for teaching two students to use a spell checker in a word processor (Kagohara et al., 2012). Moreover, the study showed the effects of using an iPad were not only to increase academic skills but also to decrease behaviors such as aggression or screaming (Neely et al., 2012). iPads can be a helpful tool to enhance many areas like communication, leisure time and social skills. This study expands on current research. Most of the current studies had small case studies. Also, technical issues that faced teachers and students during class were one of the most challenging in using any technology with a student (Malley et al., 2014). The anxiety of using an iPad is one of the biggest problems that teachers found (Hennessy, Ruthven & Brindly, 2005). Lack of appropriate experience or training for teachers could be the reasons for not using iPads (Clark et al., 2014).

This study had enough samples with 33 students from both genders with different ages and educational levels. Also, to cover technical issues, there were two qualified teachers who had enough experience to deal with technology such as iPads. This study illustrates how interactive technologies like iPads are going to affect learning methods.

Methods

Participants

Participants included 33 students from both genders with different ages and educational levels. The students ages were between 5 and 16 years old. Moreover, 27 healthy students and six with health issues like epilepsy and hearing impairment. All were assigned to a different task according to their educational plan. Two qualified employees participated in the study. They were involved as computer teachers to give tasks to students. Both of them had a Bachelor degree either in information technology or information system management. Also, they had training courses in how to deal with ASD.

Materials

In 2014 & 2015, two surveys were distributed to collect technical information for students either at home or the center. The first survey distributed to 33 families to gather technical information about pupils at home. The technical information included questions such as: does he or she have an electronic device, types of device, any required tasks, daily hours spent and who is with the student when the device is used. The survey was completed by parents or the person responsible for the student. The total number of participants were 24 families. There were nine families who did not give feedback. The second survey was filled in by computer teachers to illustrate how students interacted with iPads in the educational environment. The total number of participants were 33 students.

Apparatus

In the study, we used a desktop to put a device on it and visual timer to calculate time. There are many tablet devices available but for this study we used iPad minis with the following specifications:

- 1024 x 768 Native Resolution
- Dual-Core Apple A5 Processor
- Up to 10 hours of battery life
- Mobile connectivity: WiFi
- Storage:16 GB

Additionally, various applications were used with different languages and purposes, for instance: matching colors, matching shapes, puzzles, learning numbers or the alphabet.

Procedure

In order to apply using iPads for autistic students, we started sessions in the computer lab. The reasons behind using computer classes are: both computer teachers had a technical background so they could deal with any technical issues in a session and the duration of the session was short enough to find results. Duration for the computer class is 25 minutes, divided according to the educational plan and requirements for each student. In the computer lab, each student had one to two computer sessions a week. At the beginning of the term, computer teachers followed an assessment to measure student skills. The evaluation covered different aspects of ability to hold and interact with the device, matching, classification, learning letters or numbers. It measured how much time was needed to achieve tasks or goals. As mentioned before, 33 students participated in the study. Participants were given many tasks according to their educational plans. Table 1 shows five students with their information, tasks, and progress during sessions.

Student name	Age	Gender	Does he or she have an iPad	Health issues	Tasks	Progress
AB	6 years	M	Yes	No	Classify according to color or shapes like: <ul style="list-style-type: none"> • choose the red color with the same shape color • match rectangle shapes with multiple forms on board. 	4/10 6/10 8/10
WQ	10 years	F	Yes	hearing impairment	Classify according to color or shapes like: <ul style="list-style-type: none"> • choose a red color with the same shape color • match rectangle shapes with multiple forms on board. 	4/10 6/10 8/10
AK	11 years	M	N/A	No	1- Classify according to shape sizes like small, medium or large. 2- Match between letters and words that start with the same letter.	4/10 6/10 8/10
AH	13 years	M	No	No	Conceptually matching: match between animals and their living area such as: where a lion lives: <ul style="list-style-type: none"> • sea • jungle 	4/10 6/10 8/10
KA	13 years	M	N/A	Epilepsy	Match numbers with the shapes	4/10 6/10 8/10

Table 1. Five students with their information, tasks, and progress during sessions.

Results

The results found that 20 of the students had electronic devices at home (See Figure 1). Electronic devices including computers (9), iPads (17), iPods (0), Xboxes (1), PlayStations (2) and mobile phones (4). In using iPads at home, eight of the students spend 1-2 hours a day, six of them spend 3-5 hours, and two students who spend 6-8 hours and two for more than nine hours. Children who used iPads at home either with their mother (7), father (1), sister (8), nanny (2) or alone (10). In using iPads at the Center, there were two groups. The first group included 27 students who responded

and they performed tasks successfully (See Figure 2). All participants achieved four out of ten on their first attempt of the given task. Then the percentage increased to a score of six out of ten. Finally, all participants were successful with a result of eight out of ten. (See Figure 3). Eight of them had a high academic level, so it was used as a reinforcer when he or she completed the work. The second group which included six students, did not use it for many reasons: lack of interest, exhibited panic related to the device and one of the students has Symbrachydactyly (Short or Missing Fingers).



Figure 1. Does the student have an electronic device at home.



Figure 2. Does the student interact with iPads during sessions.

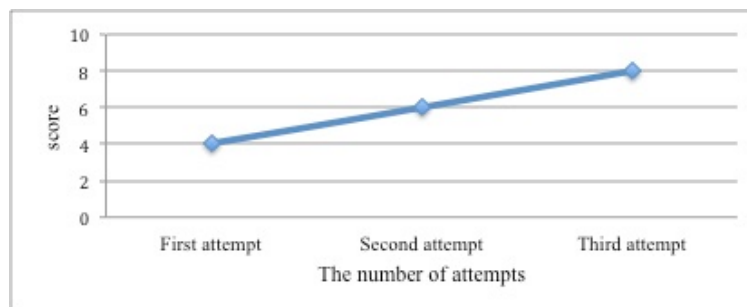


Figure 3. Students' progress during sessions.

Conclusion

In conclusion, technology has a positive impact on learning methods for students with ASD. Students accepted using iPads; they performed given tasks according to their educational plans. Some of them had a high academic level, so it was used as a reinforcer when he or she completed an activity. However, around 18 percent of students were not interested and, refused to use iPads. Also, the study showed that the well-trained teachers could have an effect on the learning experience. They solved any technical issues immediately without stopping the session. Teachers mentioned that using iPads helped them to have a variety of effective strategies for students. Moreover, families already had sophisticated technology at home with their children, but not all of them were used for educational purposes.

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