

Children with High Functioning Autism Acceptance in Using Tablet

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Abstract—This paper presents the preliminary study of the tablet acceptance among children with high functioning autism. Children who were diagnosed with high functioning autism have an IQ score of 80 or above. Generally, their autism characteristics are not obvious and often they are mistakenly underserved as having a low profile characteristic. The discussion is generally based on observation of three sample high functioning autism children, feedback from distributed questionnaire to all of 20 caregivers at National Autism Society of Malaysia (main center at Titiwangsa, Kuala Lumpur) and interview with autism specialist from the same organization. This preliminary study will help to see on the tablets potential of becoming a new assistive technology device as a pacing technology for autism children.

Key words: autism; assistive technology; special education; tablet;

I. INTRODUCTION

For most of the cases, there are chances for children who are diagnosed to have autism to live close like a normal life. Based on Dr. Temple Grandin own experience as an autism child, she manages to go through her life and healed from autism symptoms [1]. Dr. Temple Grandin used to be diagnosed to have autism. She has been trained and taught by her dedicated teacher everyday with constant exercise.

Technology is a route to empowerment and improvement especially for disabilities people. There are so much of assistive technology can do and to be part in education system for special kids especially autism children. Educating these special children can be challenging as they need special method and different approach of teaching them. The need of exploring this latest assistive technology is to help ends the struggles among autism children in their education phase.

Figure 1 is graph that summarizes the results from questionnaire survey that shows which autism group is able to use computer best. The evaluation of which group is best to use computer is based on the following factors:

A. Time required in mastering how to control and use computer peripheral devices, such as mouse and keyboard.

- B. Master skills of operating basic computer features such as controlling mouse, able to navigate arrow (either using mouse or keys from keyboard), close the window, and so on.
- C. Able to use application software and understand its instructions.

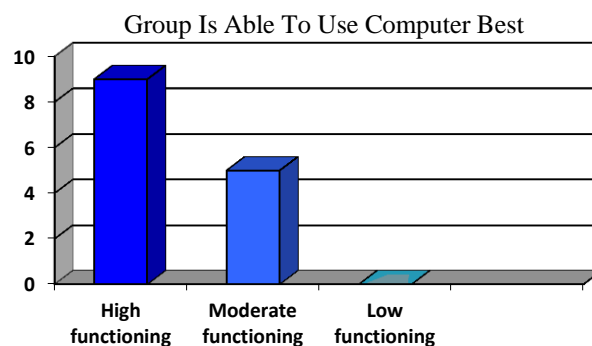


Figure 1. Computer usability

Data from figure 1 above was taken from the questionnaire distributed among 20 caregivers in NASOM. Majority of them agreed that the high functioning autism is the best group that can use computer with without supervision from adults. Even they might face some challenge at the beginning, after some times, they started enjoy using the computer. None of them agree that autism with low level functioning will successfully use computer without getting help from the adults.

II. TABLET COMPUTER AS ASSISTIVE TECHNOLOGY

A child who is diagnosed with autism is always encouraged by rewards in order to motivate them in completing their task. As mentioned by most of the caregivers, computer is the most powerful rewards that never fail to be as a successful motivator for these children. The children were encouraged and will be very eager to finish the task just to get to play with the computer game.

Children with autism especially high functioning group somehow really can adapt well in no time when handling computer even as the matter of fact, they do not own one in their family.

Tablets are bringing a new computer category for today's users. The pros and cons of the tablets were debated everywhere. The evolution of a computer is not reach to its end yet. Even though people are only aware of the tablet after popularized by iPad, tablets are actually has been around since late 1987 [2]. Despite of its drastic evolution of tablets design, features and functions, the tablets are nowadays designed with similar look design with similar functions. A tablet allows user to interact with the computer program with using finger touch, tapping on the screen or even by using a stylus. It is a wireless device and portable enough to be used by anyone at anywhere.

Several of functionalities were installed in latest tablet so that it can be used in many different levels of people.

Some of the tablets were designed to work with attachable keyboard dock so that it can be used whenever necessary. Some of the tablets also offers stylus pen for those who are not comfortable using finger tips or need more precise pin-point.

The tablet is no longer only a pacing technology; it is now a key technology in the computer world. The tablets affect many of disciplines and industries. The acceptance of tablet has changing the world of web development, games, education, nerves therapy, and many others.

The tablet technology has becoming more popular among parents who have special children when more and more cases reported that tablet is a miracle device for their autism child. Tablet can be an answer for parents who cannot afford to bear with the long term autism therapy cost. In some cases, tablet can lessen the autism symptoms and gradually heals the autism children.

III. FINDINGS

Two high functioning autism children and one moderate functioning autism child from NASOM were randomly selected to be part of the tablet usage survey.

They were given a tablet to play on. First student – high functioning autism children, age 7-year-old have no problem at all in handling the tablet. It was his first time using the tablet. When asked whether or not he familiar with the tablet, he spontaneously answer, "I know. It's the iPad." Even the tablet used at that time was Samsung Galaxy Tab, but he recognized the tablet as iPad. According to him, he have seen the "iPad" before but his family did not own one. When the tablet is turned on, he seems to be interested and eager to explore the tablet. He waited patiently until the game application is opened but not for long time. If the waiting time is longer than he expected, he will easily shows his boredom and sigh. Perhaps by observing how to navigate the screen, he straight away started to know to swipe and tap on the screen. He shows his excitement using the tablet and play

the game without struggling. Same goes with the other two students. They straight away understand on how to navigate the touchscreen tablet. This might be cause of a much simpler device that can easily be controled by them. All the three students do not have problem in swiping and tapping the tablet screen. So this shows, sensory issue might not a main constraint in using tablet. Even if there might have some cases with the sensory issue, they can use tablet stylus pen as an alternative.

However, despite that they are quite fast in mastering the tablet, one of the threestudents prefer to explore the tablet by his own. He is 10-year-old and diagnosed to have moderate functioning autism. He refuse to accept any assistant from adults and keep on exploring tablet apps such as calendar, taking picture using tablet's camera, slide through the tablet screen, and so on. He is exploring all the attracted application as if he is in his own world. The only thing that made him scared was the sudden sound from tablet game application. This student covers his ears with his hands immediately after he heard the sudden music and tries to get away.

According to his teacher, this student is afraid of sudden and extreme sounds. In many study, researchers found that for few cases, autism children have noise or sound sensitivity. Theywill easily be frightened when they heard of sudden changed sounds. Some of them claim that the sound hurt their ears. Teachers at NASOM take the solution by teaching them to turn off the computer volume when using computer in case the students do not want to hear the sounds.

As mentioned earlier the observation is using the Samsung Galaxy Tab with its refresh rate is 68Hz. The refresh rate does not seem to bothering much for all the three students. The flicker rate is not that obvious can be seen on the small screen compared to personal computer monitor screen.

A. *Advantages of tablets to the autism children*

As discussed, computer is a powerful tool that helps autism children in many ways especially in education and learning.

Rapid development technology nowadays has transformed the traditional education system. The education no longer restricted to the blackboard and whiteboard, but also to the "pixel-board" that is – computer. And today's learning experience is expended and more interactive as people are offered with more portable computer that is tablets. This new technology wave is transforming teaching and learning system across the board.

Among of the advantages of using tablets is its portability. The autism children have a need to feel that they can control the environment. The feeling of unsafe can make them uncomfortable and distract them in many ways. Tablets can offer flexibility to the autism children where these

children can use the tablets at any of his comfort environment and not restricted on the table.

Another advantage is the refresh rate of the tablets. Many of the latest tablets offer minimum refresh rate at 60-68 Hz. The higher refresh rate is the better as this will reduce the headache and fuzzy vision to the autistic children. Autistic children have an optical sensitivity. As being told by caregivers at NASOM, some autism students complaint of getting drowsiness and headaches when using computers for quite sometimes. The fluorescent lighting commonly causes drowsiness, headaches, migraines, and difficulty in concentration. So starring to a large monitor screen at a long time with low refresh rate could be stressful for an autism child.

The feedbacks from the distributed questionnaire shows most of the students are able to use computer with minor supervision from the adults. Most of the time, children with autism always get frustrated when using computers. As much as they love to use computers, gripping and grasping mouse and finding keys on keyboard are pretty challenging for them. On the average, questionnaire respondents (caregivers) give moderate rate on the students' computer skill.

As being told by one of the autism teacher in National Autism Society of Malaysia (NASOM), they have difficulties in manipulating and controlling computer peripheral devices. At the beginning the students need to be assisted by the caregivers. Some students require weeks or month to master the computer skills or at least able to use computer with minor supervision and some of them only take 10 minutes.

Based on the observation done with few high functioning autism children at National Autism Society of Malaysia NASOM, they are easily captivated with the tablets. Even though it was their first time using the tablet, they enjoy tapping, touching and see the responsive effects while using the tablets applications in no time.

Touchscreen on a tablet is a blessing for the autism children as this features eliminates the use of peripheral devices such as mouse and keyboard. With the use of either their finger tips or stylus pen – for those who have sensory issues, they can navigate and control the computer programs a lot easier.

B. Disadvantages of tablets to the autism children

As more and more of families taking advantage of using the tablets, there are few issues arise when using tablets among autism children.

As stated earlier, during the observation, there is one autism student immediately covering his ears with hands when a tablet application started with music and sounds. Normally, according to his teacher, students who are sensitive to sudden sound will just run away from computer or will close the power off button on the computer speaker. They tend to be frightened with the sudden and extreme sounds. For tablets, since it is a new device for the autism

student, he just ran off and covers his ears because he did not know how to turn off the sound.

The fact that few disadvantages of tablets are arise, the pros however has outweigh its cons.

So far, there are no sensory issues arise during the observation. The high functioning autism children seem has no difficulties swiping the touchscreen. In case for autism children with sensory issues, they can always try using the stylus pen for browsing the tablet.

The fact that the tablet brings numerous advantages in autism education learning process, with its excessive use, an autism child might have more difficulties in socializing with others. It is important for all parents of any child, not only the autism child, to monitor their children on how long they use the tablet.

IV. CONCLUSION

Tablets are potential tools to be powerful assistive technology in helping special children especially autism children. Hopefully tablet computer aided teaching system will improve and open a new pathway in autism education so that they can live close to normal life as anyone else.

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REFERENCES

- [1] Dr. Temple G., 2002. *Teaching Tips For Children & Adults With Autism*. [online]
Available at:
<http://www.autism-help.org/communication-teaching-tips-autism.htm>
[Accessed on 12 October 2011].
- [2] Vincant A., 2011. *Evolution of Tablets [infographic]*. [online]
Available at:
<http://www.vincentabry.com/en/evolution-of-tablets-infographic-808>
[Accessed on 14 October 2011].
- [3] *About autism*. [online]
Available at:
http://www.nasom.com.my/index.php?option=com_content&view=article&id=52&Itemid=53&lang=en
- [4] Wayne J. K., 2000. The Sound Connection, *First Annual Congress of International Association of Berard Practitioners*, Antwerp, Belgium.
- [5] Glem O. S., Tamlynn D. G., 2005. Intensive Behavioral Treatment for Autism. *American Journal on Mental Retardation*, 110 (6), pp.417-438.
- [6] William. V.III, William R.P., John D. E., 2000. The Learning Aide: A Device Developed for Autistic Children who are Computer Literate. William. V.III.,. *Proceedings of the IEEE 26th Annual Northeast Bioengineering Conference*, 08 – 09 April 2000. IEEE Publisher.
- [7] Lewis C., 2007. Simplicity in Cognitive Assistive Technology: a Framework and Agenda for Research. *Universal Access Information Society*, 5(4), pp. 351-361.