

# Measuring the Engagement of Modules in Educating Social Interaction Skill for Children with Autism

I. N. N. Ahmad Azahari<sup>\*1</sup>, W. F. Wan Ahmad<sup>1,a</sup>, Z. Jamaludin<sup>2,b</sup>, A. S. Hashim<sup>1,c</sup>, and N. S. Abdul Aziz<sup>1,d</sup>

<sup>1</sup>Universiti Teknologi Petronas, Bandar Seri Iskandar, 32610 Perak, Malaysia.

<sup>2</sup>Universiti Utara Malaysia, 06010 Sintok Kedah, Malaysia.

<sup>\*</sup>nabilaazahari@gmail.com, <sup>a</sup>fatimhd@petronas.com.my, <sup>b</sup>zulie@uum.edu.my, <sup>c</sup>sobri.hashim@petronas.com.my, <sup>d</sup>nsaa71@yahoo.com

**Abstract** – Autism is a neurological disorder that affects the growth of mind, causing problematic measure in communicating, interacting, and social behaviour. Outstanding educational practices and rapid intermediation leads to vast improvement, as there is no remedy for autism. The main impairment of children with autism is their difficulty in social interaction. The main research is to recognize the effective learning approach in educating social interaction skills to children with autism using mobile technology. This paper presents the result of a engagement session of video modules to support social interaction training for children with autism. The modules are designed to be a part of a mobile application that will be developed based on the three basic interaction skills; Introducing Yourself, Emotions and Gestures. Engagement session was conducted where students with medium functioning Autism Spectrum Disorder (ASD), aged 7-18 years watched the modules for social competence training during a single session. Outcome measures included an observation study of the student's reactions towards the modules by two observers. The observers graded each student's reactions using a 'Social Skill Rubric' that has five specific criteria to be scored. Results showed excellent acceptance of modules as well as strong preferences amongst them. The students revealed a range of different reactions towards the modules. However, mainly the modules do appeared to be effective in educating social interaction to children with autism as they are able to focus and enjoy in the learning process. **Copyright © 2015 Penerbit Akademia Baru - All rights reserved.**

**Keywords:** Autism Children, Social Interaction Skill, Mobile Technology, Video Modules

## 1.0 INTRODUCTION

Understanding the behaviours of children with autism can be a trouble, as each of them are unique and diverse in their own qualities [1]. Autism Spectrum Disorders (ASD) is common childhood neuron developmental disorder [2]. Core characters comprise social and verbal impairments, sensory restriction and monotonous stereotype behaviour. Although auditory skills are their flaw, visual learning skills are generally their strong quality [3].

This paper has identified two main problems which are the core setback of children with autism is their impairments in social interaction skills, and the current teaching materials have lack of therapeutic effect on the students. Children with autism's capacity to participate behavioural

and emotional skills to familiarize in a varied social context are impaired. Therefore, this reduces their capability to study and interact properly with other children [4].

There are many learning theories being applied to help these children in their daily skills improvement. However, it is still unknown on which learning theory that is most effective in teaching social interaction skills.

Visual approach is a latest technique in educating children with autism, which uses pictures, videos or other visual items to educate [5]. It is proven that using visual approach is the best method, as these children are known for their visual oriented characteristic. They commonly show potencies in concrete thinking, memorization, and understanding of visual relationships, and battles in abstract thinking, social perceptive, communication, and attention [6].

Mobile technologies are a well-known trend today. Education is able to transform to more enjoyable medium with the help of technology. For a child with autism, it is vital to sustain their interest in learning, as they are easily side tracked with other things. Therefore, with the help of mobile devices like iPad or tablets, their learning concentration and motivation could be enhance. Most of the autistic children respond well with the visual display that iPad offers. Even though occasionally technology is problematic, but with iPad is definitely easier for kids with autism than without [7]. Thus the objective of this paper presents the engagement session results of the children interaction towards the modules.

## **2.0 LITERATURE REVIEW**

ASD is identified as a neurological disorder that effects the growing of the brain, causing in struggles with learning, communication, and social interaction [8]. ASD is not an unusual sickness; it affects approximately 1 in every 165 persons [9]. It happens naturally and discovered in the child by age 3. Around 35 million people all around the world are affected by autism. While in Malaysia, one out of every 600 children is born with autism. Recent statistics show that some 47,000 of the people in this country are autistic [10]. Nevertheless, in a survey in US found that one in every 150 children is autistic. In other words, there would be more than 3,000 new cases each year nationwide.

It is a challenge to develop the skill of children with autism, as each of them is unique in their own ways. However, the continuous practices and supports done by parents, teachers and even specialist are crucial to improve each child's behaviours and strength.

People with autism daily struggle to overcome, balance for and manage many of autism's greatest bewildering features [11]. This proves that autism in all ages are trying their best to have an ordinary daily lives like other normal people. Autism's characteristics can be classified into three major areas: unusual/challenging behaviours, speech/language interruptions and impairments, and the indescribable social interaction skills [12]. Even though these three fundamentals may be usual to many autism, but not large number of autistic children have the exact similar characteristics with one and another. Every autistic child may show different types of symptoms [13].

Communication is the main medium for humans to interact with each other and to understand their surroundings. Thus it is vital for children to develop their communication skill at a young age. Nonetheless, another setback of autistic children is their impairment in communication skills. They are having trouble understanding other people as well as conveying their thoughts and feeling to others [14]. Besides that, they also have problem in non-verbal communication

like hand gestures and facial expression. Thus, parents and teachers could not perfectly speak with autistic child as understanding the children's expression is difficult as well as the children themselves could not express what they want. Plus, they have a delay in the capability to initiate or sustain a conversation with the people around them [15].

Socializing is a skill needed for humans to run their everyday lives by understanding other people's needs and desires, exchanging information, and reliance with one and another. Autistic children face countless obstacles daily, however their complications in socializing with people around them are most challenging. Social interaction difficulties include trouble in peer interaction, drawback in using and understanding nonverbal communication, and restricted imitation of other's actions and sounds [16]. As they have difficulty in peer interaction, they have hard time in making friends and might not seem attracted to doing so. On top of that, they are unable to recognize people's feelings and actions, besides may express little or no facial expressions in response to others [15]. Thus, the disabilities to socialize with others can be upsetting, to the autistic children along with the people around them. This also result in decrease of their independence performance, whereby restricted social interest may decrease the whole impulsiveness in skill demonstration, thus increasing the need of adult provision. Impairment in social and communication field, contribute to the obstacles around independent performance [17]. In addition, they have poor concentration, constant questioning or repetitive inquiring, and difficulties in understanding body languages like emotions, gestures and eye contact [18]. As a result, autistic children are not able to have social bonding and getting what they want and need.

Visual approach is a new and effective technique in educating autistic children, which apply pictures, vieos or other visual items to communicate [19]. Other researchers are investigating different strategies to support the development and learning of young ASD. According to [20], the visual approach has been very applicable in enhancing skills for young students with autism. The step-by-step, sequential process is clear and easy to implement and track the students' progress. The procedures, progressive development is well defined and simple for teachers and parents to apply and keep record of the child's improvement. A rising understanding of the visual learning practice of autistic children was becoming popular in the academic society [21]. Autistic children go thru their daily routine by visual supports. It eases them from the pressure to recall what happens afterward, give a clear path between actions, and aid them to manage time.

Therefore, with the help of visual approach, autistic children are more motivated and are able to develop more as their key strengths are being applied daily. Most applicable pictures or visual items used to assist these children are by using real pictures. Studies shows that by using real pictures, children able to better understand and apply those visual items as it is related to their surroundings. Animated pictures or symbols might be confusing to them, as those are not similar and not actual to what they see in the real world.

### **3.0 METHOD**

#### **3.1 Participants**

Two special needs classes were involved in the engagement session from two different schools, which are a primary school, SK Sultan Yussuf Perak, and a secondary school, SMK Wakaf Baru Kelantan. A total of 18 students with medium functioning ASD, aged 7-18 years were involved; 10 students from SMK Wakaf Baru and 8 students from SK Sultan Yussuf. They were low to moderate users of mobile devices.

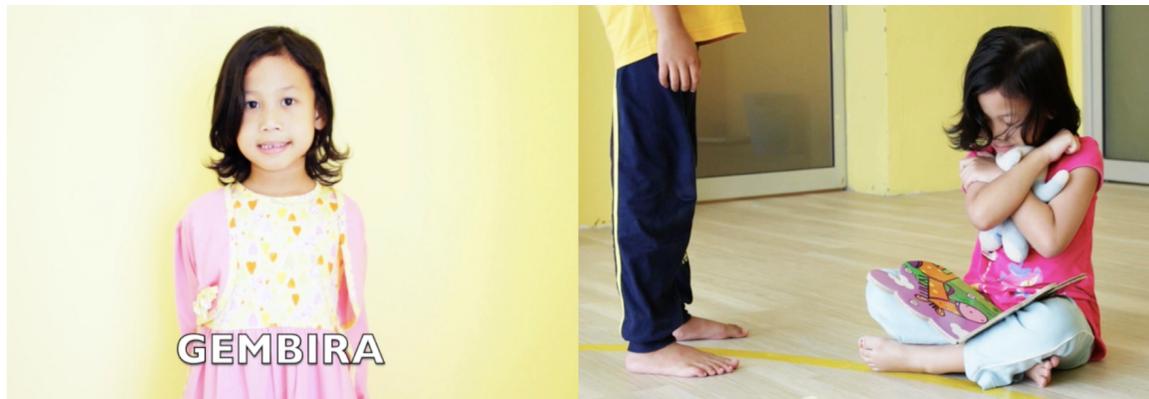
### 3.2 Instruments

The modules consist of a video display of the social interaction skills activities intended to educate the children with basic social interactions. It adapted the visual approach method whereby the modules uses actual or real-life people to act in the video. There are three modules included; introducing Yourself, Emotions and Gestures. Each module has three to five videos with duration between 30 seconds to a minute. Children could pause, stop and repeat the video based on their needs. It is essential for the children could repeat the video in order to enhance their understanding, learn, recall and imitate the modules shown.



**Figure 1:** Introducing Yourself Module

Based on Fig. 1, Introducing Yourself module displays a two-way interaction between an adult and a child. A series of simple basic questions were being asked to the children regarding on themselves. Example; ‘What is your name?’, ‘How old are you?’ and ‘Where do you live?’. Since these children are having problem even in basic conversation, therefore it is crucial to ask simple understandable questions for them to answer.



**Figure 2:** Emotion Module

According to Figure 2, Emotions module displays different children expressing three different emotions, which are happy, sad and anger. In the module, the children acted out different conditions on why those emotions could happen. This would give a clear view to the children on how and when those emotions should be used and occur. Most children with autism does not understand emotions and have trouble showing emotions as well [22]. Hence it is fundamental for children to learn those emotions and apply them accordingly.



**Figure 3:** Gesture Module

Figure 3 shows a sample of the Gesture Module. Gesture Module exhibits diverse children expressing different body gestures to ease their communication with other people. In the module, the children also acted out different conditions on when and how the gestures should be used. Most children with autism are able to acquire speech skills. However it is not as the similar rate as a normal child, and their progress is typically slow and uneven [14]. Children with autism are more likely to convey request and communicate using body gestures as it ease their visual stimuli [23]. Thus providing another solution in communicating with their surrounding using body gestures, could possibly enhance their social interaction skill.

For the engagement session, children will be given the opportunity to watch the modules and being evaluated based on their reactions towards the videos. In the next progress of the research, the modules will be embedded in a mobile application for further development. Before application is being developed, the modules are evaluated for its effectiveness.

### 3.3 Rubric

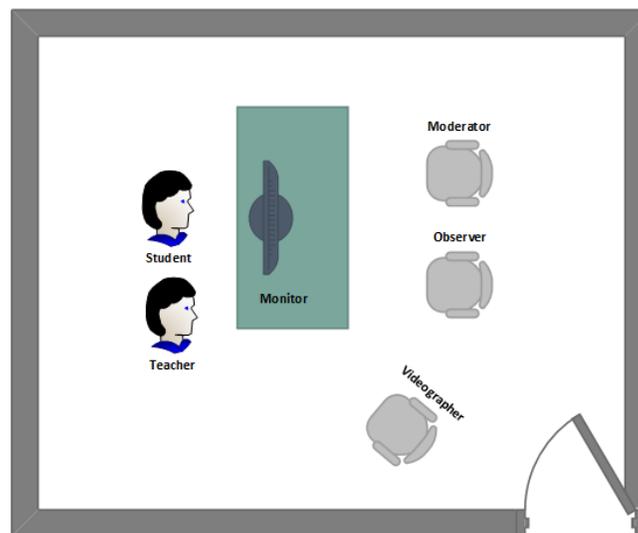
A rubric progress chart is used as a tool to measure the student's reaction towards the module displayed. During engagement phase, two observers will rely on the rubric chart as they observe and provide the scores for each of the students. The rubric chart has four points rating from 0 to 4; 0 for Poor, 1 for Fair, 2 for Good and 3 for Mastery. Moreover, the rubric chart has 5 criteria to be scored which are Looking, Listening, Following Directions, Answering Question and Asking Question. Table 1 displays the sample of the rubric progress chart that is being scored by the observers on the children's reactions.

**Table 1:** Rubric Progress Chart

<b>Progress Chart</b>	<b>Poor 0 pts</b>	<b>Fair 1 pts</b>	<b>Good 2 pts</b>	<b>Mastery 3 pts</b>
<b>Looking</b>	Does not look at video when prompted.	Looks at video when prompted, and then looks away.	Looks at video when prompted, and continues to hold gaze appropriately.	Looks at video without being prompted and holds gaze appropriately.
<b>Listening</b>	Does not show signs of listening when watching the video.	Shows signs of listening when watching the video, but not for half of the lesson.	Shows signs of listening when watching the video for at least half of the lesson.	Listens when watching the video, and for duration of lesson.
<b>Following Directions</b>	Does not follow directions: verbal or picture format.	Follows directions when given verbally and/or in picture format, but only when redirected constantly.	Follows directions when given verbally and/or in picture format with 3 or less re-directions.	Follows directions in either verbal or picture format with 1 or less re-direction.
<b>Answering a Question</b>	Does not answer questions.	Gives a verbal response, when given a full prompt.	Gives a verbal response, when prompted.	Answer a question independently, or verbally responds.
<b>Asking a Question</b>	Does not ask questions.	Verbally questions, when given a full prompt.	Verbally questions, when prompted.	Ask a question independently, or verbally questions.

### 3.4 Procedure

Figure 4 displays the set-up of the observation room for engagement session. During this phase, the child was assisted by a teacher to make them feel ease in the observation room. They were seated in front of a monitor that displays the modules. A videographer records them during the whole process.



**Figure 4:** Observation Room Set-up for Engagement Session.

The moderator and observer seated in front of the child to get a clear view of the child’s reactions. Moderator also acts as an observer during this phase. The whole interaction is being recorded and scored using the Rubrics Progress Chart. The modules are displayed in a monitor to get a better concentration of child’s reaction only towards the module. In the future evaluation, the modules will be embedded in a mobile application, and will be tested to the children and teachers.

#### 4.0 RESULTS AND DISCUSSION

Three results comparisons were made from this engagement phase that are students’ comparisons, module comparisons, and primary and secondary school comparisons.

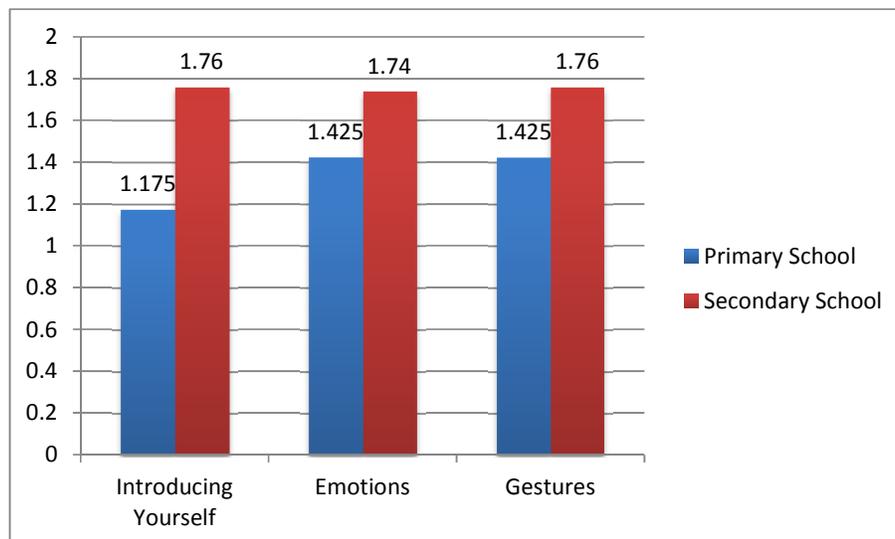
##### 4.1 Student Comparison

Each students shows different reaction towards the modules. Some were captivated to watch, and some were very passive and avoiding eye contact. Majority of them were fascinated to watch the modules displayed. They were curious with the medium used. Only a few students are unable to concentrate with the video, as there are many other things that catch their attention.

##### 4.2 Video Module Comparison

The results show that Most of the students are more likely to be interested with the Emotion Module. The Emotion module is more interactive and suited with their environment. They hold their gaze until the end of the video. However the least like is Introducing Yourself module, whereby most students’ looks at the video when prompted, but then looks away. This shows that they are not intrigued and less interested with the module.

##### 4.3 Primary and Secondary School Comparison



**Figure 6:** Bar Chart of the Average Results Modules

Age different between these two schools is quite vast, therefore the reactions between these two schools is very diverse. Based on figure 6, results shows that children from secondary school scores higher compared to primary school. Students from secondary school are able to provide more feedbacks, when questions are being asked. They seem to understand and able to adapt with the new modules being displayed to them. Even though two of them couldn't convey verbally, but others do able to react with modules. On the other hand, students from primary school are very new with the video displayed technology. They are very interested to watch the modules but unable to provide any feedback when asked. They seem to be inexperienced with the technology but eager to learn and watch more modules.

## 5.0 CONCLUSION

In conclusion, the results of the existing study have assisted to guarantee that module is suitable to achieve its therapeutic aims, namely using visual approach to train social interaction skills in children with autism. Most students do show their eagerness and passion to learn more from the medium. Nonetheless, minor of the modules need to amend in order to spike the children interest and continue using the video as their daily preferences. Future work of this research includes the amendments of modules and embedded the modules in a mobile application for further enhancement.

## REFERENCES

- [1] E. Zander, An introduction to autism Original title : Introduktion om autism, Stock. Ians sjukvardsomrade, pp. 1-4, 2004.
- [2] D.H. Geschwind, P. Levitt, Autism spectrum disorders: developmental disconnection syndromes, *Current Opinion Neurobiology* 17 (2007) 103-111.
- [3] C. Schmidt, B. Heybyrne, Expanding Behavioral Strategies and Promoting Success, in *Autism in the School-Aged Child*, Autism Family Press (2004) pp. 71-78.
- [4] N. Bauminger, Brief Report: Group Social-Multimodal Intervention for HFASD, *Journal of Autism and Developmental Disorders*. 37 (2007) 1605-1615.
- [5] W. Loring and M. Hamilton, *Visual Supports and Autism Spectrum Disorders*, Tennessee, pp. 1-3, 2011.
- [6] Ministry Of Education Special Programs Branch, *Teaching Students with Autism: A Resource Guide for Schools*. Victoria BC: British Columbia, 2000.
- [7] Family Center on Technology and Disability, *Autism and the iPad : Finding the Therapy in Consumer Tech*, *Technol. Voices*, no. 130, 2011.
- [8] Virginia Department of Education, Foundational Competencies, in *Guidelines for Educating Students with Autism Spectrum Disorders*, no. October, Commonwealth of Virginia Department of Education, 2010, pp. 6-12.
- [9] E. Fombonne, R. Zakarian, A. Bennett, L. Meng, Pervasive Developmental Disorders in Montreal, Quebec, Canada: Prevalence and Links With Immunizations, *Pediatrics* 118 (2006) 139-150.

- [10] Bernama, With Support, Autistic Children Can Move On, *The Malaysian Times*, pp. 8–10, 2015.
- [11] E. Notbohm, Ten Things, in *Ten Things Every Child with Autism Wishes You Knew*, Future Horizons, Inc., 2012, pp. 52–55.
- [12] R.P. Goin-Kochel, B.J. Myers, Parental report of early autistic symptoms: Differences in ages of detection and frequencies of characteristics among three autism spectrum disorders, *Journal on Developmental Disabilities* 11 (2004) 21–39.
- [13] Agency for Health Care Research and Quality (AHRQ), Therapies for children with autism spectrum disorders, *American Family Physician* 85 (2011) 1-4.
- [14] National Institute of Deafness and Other Communication Disorders “NIDCD,” Communication Problems in Children with Autism Spectrum Disorder, in *NIDCD Fact Sheet*, 2012.
- [15] A. Brereton, CORE FEATURES OF AUTISM : SOCIAL SKILLS, *Act Now*, pp. 1–3, 2011.
- [16] N. Poliakova, A. Palkhivala, J. Johnson, Social Impairment in Children with Autism Spectrum Disorder, *Abilities, Canada*, pp. 50–51, 2008.
- [17] K. Hume, R. Loftin, J. Lantz, Increasing independence in autism spectrum disorders: A review of three focused interventions, *J. Autism Dev. Disord.* 39 (2009) 1329–1338, 2009.
- [18] A. English, B. Jones, *Autism Spectrum Disorders Training Policy and Framework*. West Midlands Regional Partnership, 2006.
- [19] L.W. Anderson, Objectives, evaluation, and the improvement of education, *Stud. Educ. Eval.* 31 (2005) 102–113.
- [20] C. Gray, *The New Social Story Book : Illustrated Edition*. Future Horizons, Inc., 2000.
- [21] L.A. Hodgdon, *Visual Strategies for Improving Communication (Revised & Updated Edition): Practical Supports for Autism Spectrum Disorders*. Quirk Roberts, 2011.
- [22] M. Losh and L. Capps, Understanding of emotional experience in autism: Insights from the personal accounts of high-functioning children with autism., *Dev. Psychol.*, 42 (2006) 809–818.
- [23] K. Medeiros, A. Winsler, Parent-child gesture use during problem solving in autistic spectrum disorder., *J. Autism Dev. Disord.*, 44 (2014) 1946–58.