

## THE ROLE OF THE SMART ABA METHOD IN TEACHING AND TRAINING SPEECH IN AUTISTIC CHILDREN

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### ABSTRACT

*Deficits in speech are one of the core characteristics commonly found in children with Autism Spectrum Disorder (ASD). Such difficulties often create barriers in communication, social interaction, and daily functioning. This study aims to examine the role of the Smart ABA method in teaching and training speech in children with ASD, particularly through the use of imitation techniques. The research employed an experimental procedure with a single subject design. The participants were two children with ASD aged three and five years. During the initial assessment, both children showed significant developmental challenges, including the inability to speak or sit independently, minimal eye contact, high levels of hyperactivity, frequent tantrums, sleep disturbances at night, and repetitive behaviors. The intervention was conducted by therapists who had already been certified as Smart ABA therapists through formal training and supervised internships. The results demonstrated that both children successfully developed the ability to speak by imitating five words each, achieved within 89.6 and 136 days respectively. These findings suggest that the Smart ABA method can effectively facilitate the acquisition of speech skills in children with ASD. Furthermore, the method not only addresses speech deficits but also contributes to improving broader developmental challenges. The systematic application of Smart ABA highlights its potential as a structured and evidence-based intervention for speech development in children with ASD.*

**Keywords:** smart ABA, autism spectrum disorder, smart ABA therapist, speech, imitating

### 1. PREFACE

Speaking is an important skill every child must have because this ability plays a crucial role in communication and social and academic interaction. Several studies discuss the importance of speaking skills in children (Al Huneety et al., 2024; Bailey & Arciuli, 2018; Banerjee et al., 2024; Baxter & Kilderry, 2024; Hamodat et al., 2024; Parker & Slattery, 2020; Yasmin et al., 2022). Through speaking skills, children can express their thoughts, feelings, and needs clearly, which helps them build relationships with others. Good speaking skills also support academic development because many learning processes involve verbal communication, such as reading and counting. But for children with Autism Spectrum Disorder (ASD), the ability to speak is a difficult skill. This follows the characteristics of autism, including difficulties/deficits in the ability to speak (Arneliza et al., 2024; Hodges et al., 2020; Jones et al., 2014; Sivayokan et al., 2023). Deficits in speaking skills make it difficult for children with ASD to understand and use verbal language effectively (Cui et al., 2023; Lee et al., 2024; Maemonah et al., 2021; McCleery et al., 2013; Mody et al., 2016; Sankar & Monisha, 2020; Sturrock et al., 2021). They may have difficulty pronouncing vowels, syllables, words, and sentences, even though speaking skills are needed to adapt to their environment. Difficulty speaking in children with ASD begins with their difficulty in imitation.

Therefore, appropriate support and intervention methods are needed to help them overcome speaking challenges so that they have verbal communication skills. The ability to imitate is

essential in the learning process. By observing and replicating the actions and behaviors of others, individuals can gain new skills and knowledge. This process allows them to learn efficiently and accelerate mastering various abilities necessary in daily life (Tewari & Pant, 2020). However, children with ASD have problems with this ability to imitate. They have difficulty imitating the actions and behaviors of others, even in a simple form. This causes them to struggle with various complex things, such as speaking. Difficulties in the ability to imitate significantly impact the ability of individuals with ASD to learn and develop new skills (De Matos et al., 2018).

Speaking skills include producing sounds, correctly pronouncing words, and arranging words into meaningful sentences (Kjellmer et al., 2018). Some children or individuals with ASD may be able to pronounce words or phrases but have difficulty combining words into meaningful sentences or understanding spoken language. Meanwhile, others may be unable to make a sound at all or can only make a limited amount of sound. In some cases, it happens that children/individuals with ASD repeat certain words or phrases continuously (Andrés-Roqueta & Katsos, 2020).

Autism is a severe neurobiological disorder in a child's development, resulting in difficulties in communicating and interacting with the environment from an early age, and will continue throughout life if left untreated. Some researchers define autism as a developmental disorder in children's nerves, causing various disorders, such as speech, repetitive behavior, limited interest, and various other characteristics (Christensen et al., 2016; Hodges et al., 2020; Lord et al., 2020; Sivayokan et al., 2023; Tan et al., 2021). Speech delays are the most common disorder in children with ASD (Du et al., 2024; Hsu & Tseng, 2024; Samango-Sprouse et al., 2014). Because of this delay in speaking, many parents finally take their children to the doctor to discover the cause and how to overcome it.

One method that systematically, structured, and measurably teaches children with ASD to speak is Smart ABA (Smart Applied Behavior Analysis). This method is a development of ABA/Applied Behavior Analysis (Anwar et al., 2022). The effectiveness of the Smart ABA method for practicing and teaching speech has been researched by Savitri et al. (2020), Soedita (2019) and Sutadi et al. (2022). This research is very important because the results can provide deeper insights for training and teaching speech to children with ASD using the Smart ABA method.

This study aims to determine the impact of the Smart ABA method in teaching and training speech in children with ASD through imitation. With a systematic, structured, and measurable approach, this method focuses on developing speaking skills and considers each child's needs. Through this research, it is hoped that the Smart ABA method can contribute to the development of therapy for children with ASD. In addition, this research will also help develop best practices that therapists and parents can apply to children with ASD. The results of this study are expected to be the basis for developing better and more adaptive intervention programs to improve their speaking skills and help them interact more effectively with the surrounding environment verbally.

## **2. RESEARCH METHOD**

### **Samples**

This study uses an experimental research method with a single-subject design or Single Subject Research (SSR). SSR is generally used to determine whether or not there is an outcome of an intervention (25). The SSR design used in this study is A-B-A: Baseline (A-1)/Pre-treatment, Treatment (B), Post-treatment/Non-treatment (A-2). The subjects in this study are two children with ASD, a 5-year-old boy and a 3-year-old girl. Both have received a diagnosis of autism from a doctor. The subjects were treated with the Smart ABA Method on a two-on-one basis at the KID ABA Autism & Developmental Disorders Center Indonesia and the subject's home. All subjects in the initial assessment have been unable to respond to the programs in the initial curriculum, including being unable to speak.

### **Measurement**

To obtain a clear picture of the assessment of the subject's responses, it is done through a table then described. The graduation criteria are if the subject scores above or above 80% in three consecutive sessions.

### **Data collection and analysis**

In this study, data was collected through observation, which included observing and recording each subject's response. Observations were carried out to assess the subject's ability. To obtain a clear picture of the assessment of the subject's responses, it is done through a table then described. Next, data analysis techniques were carried out using visual graphs. According to Richard (26). Charts and tables are major in the analysis process of SRS research.

### **Ethical considerations**

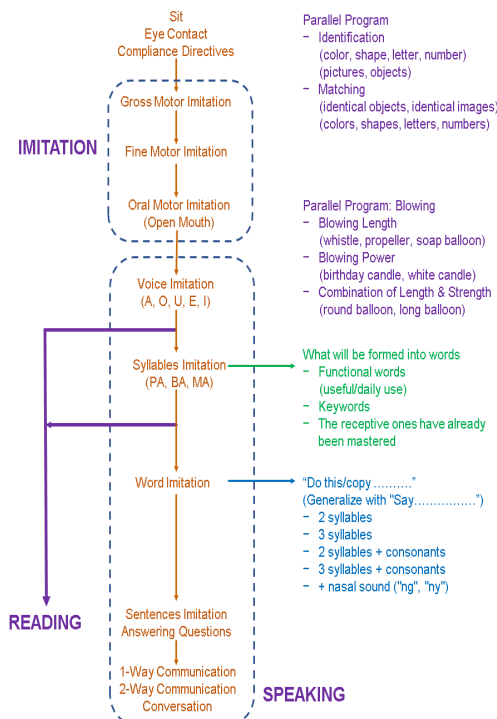
The Muslim University of Indonesia obtained ethical clearance for this research (No: 589/A.1). Both parents of the subjects gave written consent to participate in the study.

### **General Procedure**

Smart ABA therapy is conducted using a two-on-one method (one child with two therapists). The therapy takes place in a room that is free from distractions/soundproof, air-conditioned, and has adequate lighting. The room is equipped with tables, chairs for the child, two therapists, and teaching materials according to the planned program. Parents/caregivers can view the therapy sessions directly on a screen. There is a CCTV monitor in each room (one CCTV monitor for one parent/caregiver). Therapy sessions are conducted by competent therapists who undergo training and internships for approximately three months. The passing criteria are if the subject's score is at or above 80% in three consecutive sessions. One therapy session lasts 120 minutes/two hours, consisting of 90 minutes of learning and 30 minutes of breaks, while the therapists prepare a session report to be shared in each child's WhatsApp group. The therapist assistant records all of the child's responses and, after the therapy session is completed, scores the recorded responses, which are then plotted on a graph. The following is a system for teaching and training speech for children/individuals with ASD using Smart ABA, as shown in Figure 1. The systematics of speech training and teaching using the Smart ABA method for children/individuals with ASD.

**Figure 1**

*Systematic teaching and practicing speech in children/individuals with ASD using Smart ABA*



### 3. RESULT AND DISCUSSION

#### Subject A

In subject A, Smart ABA therapy is carried out in five sessions daily from Monday to Friday and Sunday. The initial assessment results to start the Smart ABA therapy session show that the subject could not speak and displayed various other abilities in the initial curriculum. The programs in the initial curriculum that are carried out are: sitting, eye contact, verbal obedience instructions, imitating gross motor, carrying out simple commands, identifying body parts, imitating actions on objects, imitating block patterns, identification of uppercase cards, identification of color cards, identification of shape cards, identification of images, identification of objects, matching various cards and identical objects including uppercase letters, numbers, colors, shapes, and objects. The intervention results using the Smart ABA method are presented in Table 1 below:

**Table 1**

*Results of Subject A intervention*

<b>Program</b>	<b>Session</b>	<b>Day</b>
<b>Gross Motor Imitation</b>	82	16,4
1. Hand up		
2. Extend your arms		
3. Pat the table		
4. Waving		
5. Applause		
6. Clap your head		
7. Pat your stomach		
<b>Fine Motor Imitation</b>	42	8,4
1. Rub your hands		
2. Open your fists		
3. Duel of both index fingers		
4. Straighten the index finger		
5. Pointing to body parts		
6. Point the index finger to the palm of the hand		
7. Summarize the hand		
<b>Imitation of Opening Mouth</b>	4	0,8
<b>Sound Imitation</b>	190	38
1. A		
2. O		
3. I		
4. E		
5. U		
<b>Syllable Imitation</b>	41	8,2
1. Am		
2. Cu		
3. Pa		
4. Ba		
5. Ma		
<b>Word Imitation</b>	89	17,8
1. Ama		
2. Iya		
3. Mama		
4. Papa		
5. Cucu		
<b>Total</b>	<b>448</b>	<b>89,6</b>

## Subject B

In subject B, Smart ABA therapy was initially carried out in one session daily, Monday to Friday. In the fourth month, the subject underwent therapy twice daily. The program starts with the initial curriculum, as in subject A's. The results of the intervention using the Smart ABA method are presented in Table 2 below:

**Table 2**

*Results of Subject B intervention*

<b>Program</b>	<b>Session</b>	<b>Day</b>
<b>Gross Motor Imitation</b>	49	49
therapy sessions, one session per day		
1. Hand up		
2. Applause		
3. Pat the table		
4. Stomp both feet		
5. Pat your thighs		
6. Extend your arms		
7. Clap your head		
<b>Fine Motor Imitation</b>	36	36
1. Rub your hands		
2. Open your fists		
3. Duel of both index fingers		
4. Straighten the index finger		
5. Pointing to body parts		
6. Point the index finger to the palm of the hand		
7. Summarize the hand		
<b>Imitation of Opening Mouth</b>	4	4
<b>Sound Imitation</b>	31	19,5
1. A	The fourth month of therapy sessions becomes two sessions per day	
2. U		
3. O		
4. E		
5. I		
<b>Syllable Imitation</b>	15	7,5
1. Am		
2. Cu		
3. Pa		
4. Ba		
5. Ma		
<b>Word Imitation</b>	40	20
1. Ama		
2. Iya		
3. Mama		
4. Papa		
5. Cucu		
<b>Total</b>	<b>175</b>	<b>136</b>

## Discussions

Teaching and training speaking in children with ASD using the Smart ABA method can be briefly explained as follows: the term teaching is used to introduce new skills or concepts. In contrast, coaching is used to help children or individuals with ASD retain and generalize the skills they have learned. Teaching with daily programs using Smart DTT and Smart DT and

various related items. Train by doing Smart DT techniques and maintenance programs mastered by Autism in the daily program. Before teaching and training individuals with ASD to imitate vowel sounds, they need first to master pre-speaking skills consisting of attending skills, imitating gross motor movements, imitating fine motor movements, and imitating mouth motor movements in the form of opening the mouth.

After mastering pre-speaking ability, the ability to speak imitating vowel sounds begins, followed by syllables, words, two-word and three-word sentences. The ability to speak imitating the standard vowel sounds starts with A, then O, U, E, I, or vowel sounds spoken by ASD children inside and outside the teaching session, which then, when run Smart Incidental Teaching succeeds until Switchback. The ability to speak imitating standard syllables starts with PA, BA, MA, or syllables spoken spontaneously by ASD children inside and outside the teaching session, which then, Smart Incidental Teaching succeeds until with Switchback. Syllables are taught and trained syllables consisting of consonants + vowels + consonants, as well as those containing nasal sounds (NG at the beginning/middle/end and NY at the beginning/middle). After they can speak, imitating vowel sounds and syllables, they continue by teaching and practicing the ability to imitate words consisting of a combination of vowel sounds + syllables and syllables + syllables. Next, imitate a two-word sentence, then a three-word, four-word, five-word sentence, and so on.

Various abilities to mimic verbal programs are used to label various cards, such as colors, shapes, photos, images, numbers, etc. The ones used include Smart Immediate Prompt, Smart Prompt/Split Prompt, Smart Escalation Prompt, and Smart Establishing Operation.

Training and teaching speaking to children with ASD is very important. Some previous studies using the ABA method for autism for speech and imitation skills (Lovaas et al., 1965) increase in nonverbal behavior that immediately follows the sending of verbal responses is still Lovaas et al. (1966) links reward giving to increased imitation. Hirata (1977) found that verbal formation in children with ASD takes a long time; it took about two months for subjects to clearly say "marital" (meaning: "wanna do"). Botha et al. (2021) emphasized the significance of research on speaking abilities in children or individuals with ASD. McDowell et al. (2015) study identified a significant difference between two types of interventions, Video Modelling (VM) and Live Modelling (LM), with the LM intervention being more effective than the VM intervention. Next, Sutadi et al. (2022) reported that a 12-year-old girl and a 9-year-old boy with ASD, who were previously non-verbal, were able to speak after intervention using the Smart ABA Method. Intensive individual therapy is very effective in improving various abilities of children with ASD, including socialization and cognitive development (Wakabayashi, 1973). Hampton et al. (2020) study indicates that after four months of implementing a multi-component communication intervention, there was a significant improvement in joint attention and social-communicative utterances (SCU) among children with ASD. About 30% of children with ASD struggle to develop speaking skills despite undergoing speech, language, and educational interventions for many years (Williams et al., 2021).

Based on the explanation above, the Smart ABA method plays a role in the speaking abilities of children with ASD, as evidenced by both subjects who initially could not speak but gradually became able to speak after the implementation of the Smart ABA method. However, Smart ABA techniques must be implemented according to their principles. Therapists conducting therapy sessions must be competent Smart ABA therapists, having undergone training and internships for

approximately three months. Furthermore, refresher training and additional debriefings are necessary to update and enhance the therapists' skills.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

The most important finding of this study indicates that the Smart ABA method plays a role in teaching and training children with ASD in their speaking abilities. Both subjects, who initially could not speak during the initial assessment, gradually became able to speak within a range of 89.6 to 136 days after the application of the Smart ABA method. This ability is to imitate the word in as many as five activities. These findings contribute to therapy for children with ASD. The daily dose of therapy is also very important in speeding up children with ASD to be able to speak. Subject A ran five sessions per day from Monday to Friday and Sunday, successfully mastering speaking skills (imitating five words) within 89.6 days. Subject B runs therapy one session daily, Monday to Friday; the fourth month became two sessions per day; her success in speaking (imitating five words) was longer than subject A's, which was 136 days.

The teaching and training techniques for speech for children with ASD using Smart ABA are applied to children with ASD in Indonesia. Further research could be conducted on children with ASD in other countries.

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