



Android-Based Learning Application Media for The Little One "SECIL" in Improving Communication of Children With Autism Spectrum

Muhammad Pahrurrozi*, Siti Masitoh, Sujarwanto

Universitas Negeri Surabaya, Surabaya, Indonesia
**corresponding author email: ditanastasia@gmail.com*

Article history:

Received: 27 December 2022

Revised: 25 August 2023

Accepted: 16 September 2024

Abstract: This study aims to determine the effectiveness of the use of the Little One's Learning Cereal Application (SECIL) media on the verbal communication skills of autistic children in Labschool Unesa inclusion elementary schools. This research is a single subject experimental research (Single Subject Research). The subjects in this study were several samples of autistic students in the inclusion elementary school Labschool Unesa. The design of this study was A-B-A'. Data collection using performance tests. The data analysis used is descriptive statistical analysis with analysis under conditions and between conditions. The results showed that the Little One's Learning Cereal (SECIL) media was effectively used in learning in improving communication skills for autistic students of Labschool Unesa Inclusion Elementary School. This is evidenced by the increase in communication skills scores before and after the intervention using the test, namely the average achievement score of 57.14% in baseline phase one to 79.76% in baseline phase two. In addition, the results of inter-condition analysis showed changes in stability from stable to stable, changes in data levels that increased, changes in direction and effects, and an overlapping percentage of data of 22.62%.

Keywords: *Little One's Learning Cereal (SECIL), Communication Skills, Autistic Children of Primary School Age*

I. Introduction

Autism is with special needs who have syndromes such as impaired social development, language skills and effective behavior in the environment. Hasdianah (2013) suggests that autism is a neurobiological development disorder that is very complex / severe in a long life, which includes disorders in aspects of social behavior, communication and language. As well as emotional disturbances and sensory perception even in the motor aspect. This symptom appears at the age before 3 years. Aziz et al (2015) suggests that autism is a condition of a person characterized by severe disorders caused by abnormal brain development or nerve disorders that affect the normal functioning of the brain so that it is weak in social interaction, behavior, and unable to communicate properly. Increasingly, the number of autistic people is increasing and very worrying. This is based on a study conducted in 2013. From the results of the study it is estimated that as many as 21.7 million autistic people in the world. (cnnindonesia.com). Data from the Center of Disease Control (CDC) in America in March 2014, the prevalence (incidence rate) of autism is 1 in 68 children. More specifically, 1 in 42 boys and 1 in 189 girls.

Based on data from the Statistics Research Agency (BPS) since 2010 with until 2016, there are around 140 thousand children under the age of 17 years with autism. Research and consulting agency, SPIRE until 2016 from mapping data of children with special needs in Indonesia, it is estimated that there are 139,000 people with autism from 400,000 children with special needs (ABK).

The problem of disorders that occur in autistic children according to Sunardi (2007) covers almost all aspects of their lives, so that the characteristics can easily be recognized, including having: speech disorders from birth, behavioral disorders, impaired social skills, difficulty empathizing, unbalanced development (intelligence). Autism is one group of disorders in children characterized by the emergence of disorders and delays in the fields of cognitive, communication, related to social interaction and behavior. Autism can be seen from the age of children reaching the age of 3 years (Ngatini, 2011). This can be seen in the limitations of autistic people in activities such

as repeating the same movements, communication disorders with others, children become very sensitive or even unresponsive to existing stimuli.

Communication is an important aspect of human life including autistic children. Some autistic children are completely unable to speak, autistic children communicate nonverbally by pointing or grabbing other people's hands autistic children who are able to speak have problems in tone and find it difficult to understand other people's speech (Block, 2006). Autistic children have difficulty in communicating because they experience obstacles in their language development, while language is the main medium in communication. If language development is impaired, communication skills will be hampered. The possibility of these obstacles arises because autistic children experience obstacles in the development of their behavior such as the ability to speak (communication).

The results of observations in December 2022, autistic children who were the subjects of the study aged 8-9 years showed that expressive and receptive communication (language) skills were not well developed. It can be seen that children are not yet able to speak verbally so that if they want something they tend to pull the hands of people around them while crying. The inability of children to communicate orally is due to several reasons, one of these reasons is the child's limitation in communicating.

According to the observations of researchers, in the results of observations at Unesa Labschool Inclusion Elementary School, Autism has used card media to imitate teacher speech. An example of using the card media is when the teacher shows a picture card and pronounces it then students are asked to imitate the teacher's speech. Not yet seen well the ability of children in verbal communication when using card media. The learning media is still conventional and not technology-based. According to Uno and Lamatenggo (2010) technology can improve the quality of education if used wisely. Danim (2013) stated that one of the low quality of student education is caused by the limited educational technology media used in the classroom.

Communication problems with autistic children can be solved, one of which is by starting to use the application of the little one's learning cereal "SECIL" containing a very interesting visual display that can move if touched. In addition, the application is able to emit a sound if the user touches the reading or image displayed. This SECIL application feature is also able to provide a type of reward with a voice system when users are able to answer or vote

the right answer. This Android-based cereal application media was used in this study. The presence of the little one's learning cereal application "SECIL" as a learning media that can be downloaded on smart phones can be used as one of the learning media in the world of education for autistic children because it still has nuances of games and movements that attract autistic children. This application can be obtained through Playstore or Appstore on smartphones.

The selection of this media is adjusted to the characteristics of autistic children, namely preferring visual media learners, auditory learners, and often imitating sounds. Learning with game, animation, and audio media can make autistic children interested. Sudjana & Rivai (2013) stated that with learning media, the teaching process will attract more students' attention so as to foster learning motivation media.

II. Method

This study used Single Subject Research (SSR) research method. According to Arifin et al (2011) single-subject experiment is an experiment using a single subject or participant, it can be one person, two people or more. This study uses the Single Subject Research (SSR) research method is a research design with a single subject dependent variable or target behavior carried out repeatedly with a certain period of time (Sunanto et al, 2006). The most important thing that is fundamental in subject research is to examine the subject under two conditions, namely before and after the intervention. The use of the Single Subject Research (SSR) method in this study was to test the effectiveness of the application of the little one's learning cereal "SECIL" on the verbal communication skills of autistic children. This can be seen in the child's verbal communication skills before the intervention and changes in the child's verbal communication skills during and after the intervention.

Verbal communication of autistic children. This can be seen in the child's verbal communication skills before the intervention and changes in the child's verbal communication skills during and after the intervention. The fundamental thing in subject research is to examine the subject under two conditions, namely before and after the intervention. The use of the Single Subject Research (SSR) method in this study was to test the effectiveness of the application of the little one's learning cereal "SECIL" on the verbal communication skills of autistic children. This can be seen in the child's verbal communication skills before the intervention and changes in the child's verbal communication skills during and after the intervention.

III. Results

A. Baseline 1

The baseline-1 phase is carried out as many as 4 sessions. In this phase the subject has not been given an intervention. In this phase, data on the subject's initial ability in verbal communication skills are obtained. Baseline-1 phase data were obtained from tests performed on subjects. Tests of the subjects' verbal communication skills in each session had different results. Here are the details of the scores presented in the table 1.

Table 1. Baseline Test

Sub Variables	Sound	Sound	Tone	Voice
	1	2	3	4
Hearing Ability	2	1	2	2
Word Understanding Ability	0	0	0	2
Ability to Answer How to Communicate	0	0	0	0
	1	1	1	1
Number of Scores	3	2	3	5
Value	10,71	7,14	10,71	17,85

B. Intervention

The implementation of the intervention in this study was carried out as 5 sessions. Each session is conducted with a duration of 25 minutes with a 5-minute break in the middle of the intervention. In the implementation of this intervention, the researcher acts directly as a classroom teacher. The medium used in the intervention is the application of the little one's cereal (SECIL).

The provision of intervention is done by face to face between the researcher and the subject so that the subject is more focused. The intervention measures given to the subject of AD are:

- Introduction, a) Preparing the place of intervention; b) The researcher conditioned the subject by taking him out of the classroom in his class; c) Direct the subject to focus on the intervention material so that the results achieved during the intervention process can be maximized
- Core, a) Initiate interventions with listening materials; b) Continue with word comprehension skills; c) Practice using the Little One's Cereal application media (SECIL).
- Researchers first exemplify how to use the Little One's Cereal application media (SECIL)
- The subject is directed to answer several word icons that correspond to their pronunciation
- The Little One's Cereal application media (SECIL) will automatically give a reward response when correct and the pronunciation of the voice is wrong accompanied by a red X icon when wrong in answering.
- Let the subject speak according to the direction of the researcher. Continue with the ability to answer, Proceed with the way of communicating in conclusion of the core activities of the intervention
- Cover, The researcher provides motivation to the subject, Close the activity with prayer.

The table 2 is a breakdown of intervention phase scores presented in tabular form.

Table 2. Baseline test result score 2

Target Behavior	Voice	Number of scores	Value
Communication skills	1	7	25
	2	13	46,42
	3	19	67,85
	4	20	71,42
	5	21	75

C. Baseline 2

In this baseline-2 phase, research was carried out as many as 3 sessions. The baseline-2 phase was carried out to determine the subject's verbal communication skills after being given an intervention using the small one's cereal application media (SECIL). Data were obtained through tests of the subject's verbal communication skills. Here's a breakdown of baseline phase 2 scores presented in the table 3.

Table 3. Baseline test result score 2

Target behavior	Voice	Shoes	Value
Communication skills	1	21	75
	2	23	82,14
	3	23	82,14

Based on the results in the implementation of baseline-1, intervention and baseline-2 phases, the following are presented the accumulated scores obtained by the subjects:

Table 4. Baseline test result score 2

Phase	Voice	Shoes	Value
Baseline 1	1	3	10,71
	2	2	7,14
	3	3	10,71
	4	5	17,85
Intervention	1	7	25
	2	13	46,42
	3	19	67,85
	4	20	71,42
	5	21	75
Baseline 2	1	21	75
	2	23	82,14
	3	23	82,14

IV. Data analysis

Data analysis in this study used descriptive statistics. Descriptive statistics in this study are presented through tables and graphs. The research data obtained were analyzed using analysis under conditions and analysis between conditions.

A. Analysis under conditions

1) Baseline 1

The components analyzed in the analysis under baseline phase one conditions are condition length, direction tendency, stability level, rate of change, stability level and range, and data footprint. In the baseline phase, one condition length is 3 with a tendency to horizontal direction. If the stability criterion is 15%, it can be known that the level of data stability in this phase is stable. The rate of change in this phase is 7.14 with stability and range levels increasing and data footprint increasing. Table 5 is a summary of the results of data analysis under conditions in baseline phase one:

Table 5. Results of data analysis under conditions

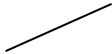
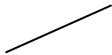
No	Condition	Baseline 1
1	Length of conditions	4
2	Directional Tendency	Increase
3	Stability Tendency	Stable 100%
4	Data Footprint	Increase
5	Stability Level and Range	Stable
6	Level Changes	7,14

2) Intervention

The components analyzed in the analysis under the conditions of the intervention phase are the length of the condition, the tendency of direction, the degree of stability, the rate of change, the level of stability and range, and the data trail. In the intervention phase, the length of the condition is 5 with an increased directional tendency (+). If you use the 15% stability criterion, it can be known that the level of data stability in this phase is stable (detailed calculations can be seen in appendix 3). The rate of change in this phase is +50 with a stable level of stability and range (75 - 25) and an increased data footprint.

Table 6 is a summary of the results of data analysis under conditions in the intervention phase:

Table 6. Results of data analysis under intervention conditions

No	Condition	Intervention
1	Condition Length	5
2	Directional Tendency	Increase
3	Stability Tendency	Stable 100%
4	Data Footprint	(+) 
5	Stability and Range levels	Stable (75 - 25) 
6	Level changes	+50

3) Baseline 2

In the baseline-2 phase the length of the condition is 3 with an increasing directional tendency (+). By using the 15% stability criterion, it can be known that the level of data stability in this phase is Stable. The rate of change in this phase is 7.14 with a stable level of stability and range (82.14 - 75) and an increased data footprint. Table 7 is a summary of the results of data analysis in conditions in the baseline-2 phase.

Table 7. Results of data analysis under conditions

No	Condition	Baseline 2
1	Length of conditions	3
2	Directional inclination	Increase
3	Stability tendencies	Increase
4	Data trail	Increase
5	Stability level and range	Increase (82.14 – 75)
6	Level changes	+7,14

4) Inter-condition analysis

Number of changed variables. The number of variables analyzed between conditions is focused on a single dependent variable or a single behavior. In this study, the number of variables changed in baseline phase 1 (A) to the intervention was 1. This is the same as in the intervention phase (B) to baseline 2 (A"), the number of variables changed and done. Table 8 is the data on the number of changed variables presented in tabular form:

Table 8. Changed variables

Condition	A/B	B/A"
Number of changed variables	1	1

Changes in Directional Tendencies and Their Effects. Analysis of changes in the trend of graphic direction between baseline and intervention phase conditions shows the meaning of changes in target behavior caused by the provision of interventions. To analyze the change in directional tendency and its effects can be seen in table 9.

Table 9. Changes in directional inclination and their effects

Inter-condition analysis	A/B	B/A"
Changes in directional inclination and their effects	/ / (+) (+)	/ / (+) (+)

5) Changes in stability and their effects

Data stability indicates the degree of stability of changes from a series of data. Data is declared stable when it shows direction (up, flat, and down) consistently. The following is a table of stability changes and their effects.

Table 10. Changes in data levels and their effects

Inter-condition analysis	A/B	B/A"
Changes in stability and their effects	Stable to stable	Stable to stable

6) Data level changes

Changes in data levels can be known by calculating the difference between the last data in the first condition and the first data in the next condition. In this study, the first data in the baseline phase one was 10.71% and the first data in the intervention phase was 25%. Once calculated, the change in data levels in baseline phase one and intervention was +7.15. Furthermore, the data level

changes in the intervention phase with baseline phase two. The first data in the intervention phase was 25% and the last data in baseline two was 82.14%. After calculation, the change in data level in that phase is + 57.14. Changes in data levels can be seen in the table 11.

Table 11. Perubahan data level

Data analysis between conditions	A/B	B/A”
Data level changes	(10,71%-25%) (+7,15)	(25%-82,14%) (+57,14)

7) *Overlapping data*

Data is declared to overlap if the same data occurs in both conditions. The more overlapping data, the more it strengthens the suspicion that there is no change in both conditions. The following is a summary of the results of the analysis between conditions in the form of a table 12.

Table 12. Results of analysis between conditions

No	Conditions compared	A/B	B/A”
1	Number of changed variables	1	1
2	Changes in Tendencies and Their Effects	Horizontal (+) to Increase (+)	Horizontal (+) to Increase (+)
3	Changes in Stability Tendencies and Their Effects	Stable to stable	Stable to stable
4	Level Changes	(10,71%- 25%) (+7,15)	(25%- 82,14%) (+57,14)
5	Percentage Overlap	(0:5) x 100% 0%	(1:3) x 100% 22,62%

Based on the results above, it shows that the provision of interventions has a positive impact on the ability to know family members. This can be seen from the level change between conditions that increase and the calculation of the percentage of overlap of 22.62%.

V. Discussion

An increase occurs at the mean level of each phase, then the small cereal application media (SECIL) is declared effective by looking at overlapping data. In this study, the data overlapped by 22.62%. In Sunanto's opinion (2006), that the smaller the percentage of overlap means the better the influence of the intervention on the target communication ability.

This media selection is adjusted to the characteristics of autistic children who prefer visual media learners, auditory learners, and often imitate sounds. Learning with game, animation, and audio media can make autistic children interested. Student communication gradually began to form and began to appear and began to run smoothly, so that students were able to be invited to communicate both ways.

Use of media The application of the little one's cereal (SECIL) with students is directly involved so as to cause a sense of pleasure. This is in line with the statement from Riyanto (2012) that one of the advantages of learning is that students are involved in the learning process so that learning becomes interesting, fun, and tends not to be boring. This is in line with Kustandi & Sutjipto (2013) which states that learning media can improve and direct children's attention.

VI. Conclusion

Based on the results of research and data analysis that has been carried out, it can be seen that the media Application of Little One's Cereal (SECIL) is effectively used in learning in improving communication skills for autistic students at Labschool Unesa Inclusion School. This is evidenced by the increase in communication skills scores before and after the intervention using the test, namely the average achievement score of 57.14% in baseline phase one to 79.76% in baseline phase two. In addition, the results of inter-condition analysis showed changes in stability from stable to

stable, changes in data levels that increased, changes in direction and effects, and an overlapping percentage of data of 22.62%.

Based on the findings and conclusions of the research above, several suggestions were submitted, especially to related parties as follows:

For teacher, The Little One's Cereal Application (SECIL) is expected to be one of the alternatives used in the learning process in order to make students want to let out their voices (communicate) actively in the learning process so as to encourage students to be able to communicate both ways.

For the elderly, Parents can support children to improve verbal communication skills by stimulating children at home using the Little One's Cereal Application (SECIL).

References

- Abdul Aziz, N. S., Ahmad, W. F. W., & Zulkifli, N. J. B. (2015). User experience on numerical application between children with down syndrome and autism. In Proceedings of the International HCI and UX Conference in Indonesia (pp. 26-31).
- Arifin, W. N., Nadiyah, W. A., Irfan, M., Wee, C. X., Draman, N., & Naing, N. N. (2011). Intraclass correlation in practice: Assessment of reliability of manual blood pressure measurement among assessors in a clinical trial. *Education in Medicine Journal*, 3(2).
- Block, D. (2006). Identity in applied linguistics. *The sociolinguistics of identity*, 34, 49.
- Danim, S. (2013). *Educational Communication Media: Professional Learning Services and Quality of Learning Outcomes*. Jakarta: PT Bumi Aksara.
- Endro, P. (2016). Indonesia is still 'dark' about autism. <https://www.cnnindonesia.com>. Retrieved December 18, 2022.
- Hasdianah. (2013). *Autism in children, prevention, treatment, and treatment*. Yogyakarta: Nuha Medika.
- Kurniawan Rahadian, Kurniasari Febriana, Rakhmawati Restu (2021). National Journal of Electrical Engineering and Information Technology Vol. 10, No. 1 Development of Virtual Animation of Children with Autism Characters with ADDIE Models. Retrieved from <https://jurnal.ugm.ac.id/v3/JNTETI/article/view/894> on December 19, 2022.
- Kustandi, C. & Sutjipto, B. (2013). *Learning Media: Manual & Digital*. Bogor: Ghalia Indonesia.
- Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia (KPPA) (2018). <https://www.kemenpppa.go.id/index.php/page/read/31/1682/hari-peduli-autisme-sedunia-kenali-gejalanya-pahami-keadaannya> . Accession December 17, 2022.
- Ngatini. (2011). *Autism at a Glance and Its Treatment*. Banten: Special Education Service Center
- Riyanto, Y. (2012). *Pradigma Baru Pembelajaran*. Jakarta :Kencana.
- Sudjana, N. & Rivai, A. (2013). *Teaching Media (Use and Manufacture)*. Bandung: Sinar Baru Algensindo.
- Sunardi, S. (2007). *Intervensi dini anak berkebutuhan khusus*. Jakarta: Departemen Pendidikan Nasional.
- Sunanto, J., Takeuchi, K., & Nakata, H. (2006). *Penelitian dengan subjek tunggal*. Bandung: UPI Pres.
- Uno, H. B. & Lamatenggo, N. (2010). *Communication Technology and Information Learning*. Jakarta: PT Bumi Aksara.