



Optimizing Expressive Language Skills of Children with Autism Through Interactive Learning Assistance Strategies

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Keywords:	Abstract
Keyword 1; Strategies Keyword 2; Learning Assistance Keyword 3; Autism	<i>This study aims to analyze the effectiveness of an interactive learning assistance strategy in optimizing expressive language skills in three children with autism (Azam, Rafa, and Alib). The research employed a Single Subject Research (SSR) method with a multiple baseline across subjects design. Data were collected through structured observations and repeated assessments during the baseline (A1), intervention (B), and second baseline (A2) phases. The indicators assessed included the ability to answer open-ended questions, construct simple subject–predicate–object sentences, express needs independently, and initiate and maintain conversations. Visual analysis revealed positive changes in level and trend across all subjects following the intervention. The coefficient of determination (R^2) values were 0.8697 for Subject 1, 0.8365 for Subject 2, and 0.8176 for Subject 3, with an average of 0.8532, indicating a large effect size based on Cohen's (1988) criteria. In addition to quantitative improvement, qualitative observations showed increased communication initiative, more complete sentence structures, and improved conversational endurance. The findings confirm that interactive learning assistance significantly enhances expressive language skills in children with autism and is recommended for inclusive educational settings.</i>

INTRODUCTION

Background of the Study

Children with Autism Spectrum Disorder (ASD) generally demonstrate significant impairments in social communication, particularly in their ability to express thoughts, feelings, needs, and ideas both verbally and nonverbally. Expressive language is not merely related to the ability to speak; it also encompasses the skills required to construct meaningful sentences, respond to questions appropriately, initiate conversations, and use intonation and gestures that align with contextual demands. Systematic and structured interventions are therefore essential to enable children with autism to optimally develop their communicative potential (Seprina et al., 2024). The school

environment plays a highly significant role in supporting the communication development of children with autism. Research indicates that principals, teachers, and peers contribute to shaping a learning climate that influences autistic children's communication skills. Findings show that intensive interaction between teachers and peers can enhance students' dialogic skills, reduce echolalic behaviors, and foster self-confidence (Esther et al., 2024).

These findings are relevant to the empirical conditions underlying the present study, which are based on expressive language assessment data from three children with autism at SLB Negeri Branjangan Jember. Based on pretest results, all three students demonstrated relatively low scores in responding to open-ended questions, independently expressing needs, and constructing simple, coherent sentences. These low initial outcomes indicate that expressive language skills in children with autism do not develop optimally without targeted intervention (Maharani & Widajati, 2025). Theoretically, children with autism experience impairments in theory of mind and executive functioning, which affect their ability to understand others' perspectives and organize language systematically. This condition necessitates learning assistance strategies that focus not only on academic aspects but also on interactive, contextual, and repetitive communication stimulation (Khoiriyah & Amilia, 2016).

Interactive learning assistance strategies represent a relevant approach in this context. Such assistance emphasizes the active involvement of children with autism in two-way communication processes, the use of prompting questions, positive reinforcement, and accurate language modeling by teachers or facilitators. This study specifically examines the optimization of expressive language skills through a structured and measurable assistance design grounded in quantitative data. The analysis was conducted by comparing pretest and posttest expressive language scores after the implementation of interactive learning assistance over a designated period. Quantitative data revealed an upward trend in scores for all participants. On average, the three students demonstrated meaningful score improvements, reflecting the effectiveness of the interactive strategy compared to previous one-directional instructional approaches.

Qualitatively, observable changes in communication behavior were also evident in classroom observations. The children became more responsive to verbal instructions, maintained eye contact more frequently during speech, and showed an increased frequency of spontaneous communication initiatives. These changes suggest that consistent and dialogic stimulation strengthens the connection between receptive language comprehension (Arifin et al., 2023) and expressive language production. This aligns with the principle that language develops optimally in socially rich environments that provide opportunities for children to attempt communication, make mistakes, and refine their skills through constructive feedback.

The ability to express oneself clearly assists children in building positive peer relationships, reducing frustration caused by communication misunderstandings, and increasing active participation in learning activities. In the long term, improvements in expressive language also contribute to the development of independence and self-confidence in children with autism. Therefore, the study entitled "Optimizing Expressive Language Skills of Children with Autism Through Interactive Learning Assistance Strategies" is highly relevant to addressing practical needs within inclusive educational settings. This research is expected to serve as a reference for teachers, special education assistants, and inclusive school administrators in designing more effective interventions oriented toward the holistic communication development of children with autism.

Problem of The Study

The research problem in this study arises from the gap between the developmental needs of expressive language in children with autism and the learning assistance practices currently implemented in inclusive schools (Williams et al., 2021). Children with Autism Spectrum Disorder characteristically experience impairments in social communication, particularly in their ability to express thoughts, feelings, and needs verbally in meaningful ways. Limited expressive language skills often result in low participation in classroom activities, the emergence of frustration-related behaviors, and difficulties in establishing adaptive social interactions.

The first identified problem concerns the low achievement of expressive language skills, as reflected in the language assessment data of three students with autism. Pretest results revealed inconsistencies in responding to open-ended questions, constructing complete sentences, and initiating as well as maintaining conversations. Some responses consisted of single words, repeated questions (echolalia), or disorganized sentence structures. These conditions indicate that the language stimulation provided has not been fully effective in fostering optimal expressive language development (Maljaars et al., 2012).

The second problem relates to learning assistance approaches that remain general in nature and insufficiently structured at the individual level. Although the school environment plays a positive role in supporting communication among students with autism—particularly through teacher and peer interaction (Frost et al., 2024)—research also highlights that individualized learning programs have not been effectively designed to address specific cognitive and language limitations. This suggests a gap between the presence of a supportive environment and the implementation of intervention strategies that are truly focused on optimizing expressive language skills.

Furthermore, inconsistencies in student engagement during the learning process were observed. Children with autism often assume a passive role as recipients of instruction, while opportunities for two-way interaction that stimulate language production remain limited. Theoretically, expressive language develops most effectively

through active participation, positive reinforcement, and language modeling within meaningful social contexts. Therefore, the limited implementation of interactive learning assistance strategies constitutes a critical issue that requires practical solutions.

Research's State of the Art

Expressive language refers to the use of words and verbal language to communicate concepts or thoughts. According to Frost et al. (2024), expressive language is defined as a child's ability to use language in various forms, including verbal speech, writing, symbols, signs, or gestures. Language impairments may involve neurological differences, such as reduced activation in Broca's area and increased activation in Wernicke's area compared to typical development. Reduced activation in Broca's area can result in speech difficulties, impaired planning, and disrupted verbal expression, often characterized by fragmented sentences and unclear articulation. Conversely, increased activation in Wernicke's area is associated with difficulties in comprehending spoken messages. Peripheral impairments may also occur due to underdeveloped pulmonary function, oral-motor dysfunction (involving the tongue, cheeks, and jaw), or sensory system disorders (Maljaars et al., 2012).

Language disorders, whether receptive or expressive, can be understood through five primary dimensions of oral language: phonology, morphology, syntax, semantics, and pragmatics. Phonology relates to distinguishing and producing speech sounds. Morphology concerns word structure, form, and classification, while syntax involves understanding and producing sentences, including the correct use of grammatical rules. Semantics refers to understanding and defining word meanings, whereas pragmatics concerns the appropriate use of language in communication contexts (Esther et al., 2024).

In general, children with autism are considered to experience expressive language disorders when there is a discrepancy between what they understand (receptive language) and what they are able to express (expressive language). According to Samsiah (2012, p. 12), expressive language involves the expression of feelings and thoughts through sentences. Expressive sentences typically contain verbs that convey internal or emotional meaning. The term "expressive," as defined in the Indonesian Dictionary, refers to the ability to clearly convey or articulate ideas, intentions, and feelings. A child is legally and socially defined as an individual born to a woman, regardless of marital status (Mues et al., 2023).

To monitor and support a child's development, the role of the family is essential. The family serves as the primary environment in which a child grows and develops, making it a crucial foundation for shaping the child's overall personality, which will influence their life trajectory. Developmental psychologists observe that child development appears to follow certain patterns or principles, which are often regarded as developmental laws guiding growth and behavior.

Gap Study & Objective

The research gap in this study lies in the limited number of investigations that specifically integrate interactive learning assistance strategies with quantitative analysis of expressive language skills in children with autism. Furthermore, most studies on children with autism in inclusive schools are still dominated by descriptive qualitative approaches. As a result, relatively few studies combine quantitative data on language development with systematic observations of communication behavior.

Research on optimizing expressive language skills is frequently conducted in clinical therapy settings or specialized institutions, whereas studies carried out within inclusive school environments—particularly those involving a limited number of participants with diverse individual characteristics—remain relatively scarce.

Therefore, this study seeks to address this gap by analyzing the development of expressive language skills in three students with autism through a structured interactive learning assistance strategy grounded in assessment-based data. This approach is expected to update and enrich the existing literature on effective assistance practices in inclusive educational settings.

METHOD

Type and Design

The research method employed in this study was Single Subject Research (SSR) using a multiple baseline across subject design involving three children with autism. This design was selected because it enables researchers to observe behavioral changes individually and systematically following the implementation of an intervention, while ensuring that observed changes are attributable to the treatment rather than to external factors.

In the multiple baseline across subjects design, initial measurements (baseline/A) were conducted simultaneously for all three participants to determine their level of expressive language skills prior to the intervention. During this phase, data were collected through structured observations and expressive language assessment sheets, which included the following indicators: (1) the ability to answer open-ended questions, (2) the ability to construct simple subject–predicate–object sentences, (3) the ability to express needs independently, and

(4) the ability to initiate and maintain conversations. Baseline data were collected repeatedly until a stable pattern of performance was established.

The intervention (Phase B), consisting of an interactive learning assistance strategy, was then introduced sequentially and not simultaneously across participants. For example, the intervention was first implemented with Azam, while Rafa and Alib remained in the baseline phase. After consistent improvements were observed in Azam, the intervention was subsequently introduced to Rafa, and later to Alib. This staggered pattern was intended to demonstrate a functional relationship between the intervention and improvements in expressive language skills.

Data were collected continuously during each session by recording the frequency, duration, and quality of the children's verbal responses. Data analysis was conducted using SSR visual graph analysis techniques, which included evaluation of level changes, trend direction, data stability, and phase comparisons (baseline versus intervention) (Sofa et al., 2024).

Data and Data Sources

The data in this study consisted of both quantitative and qualitative data obtained from three children with autism who served as research participants. The quantitative data comprised expressive language skill scores collected through repeated measurements during the baseline and intervention phases within the multiple baseline SSR design. The assessed indicators included the ability to respond to open-ended questions, construct simple sentences, express needs independently, and initiate as well as maintain conversation.

Data collection technique

Data were collected through structured observation, recording the frequency of verbal responses, and assessing expressive language performance using evaluation sheets during each baseline and intervention session. The data were gathered repeatedly through continuous recording within the multiple baseline SSR design to examine changes in level, trend, and stability of communication behavior. Data analysis was conducted using visual analysis techniques characteristic of Single Subject Research (SSR), focusing on level changes, trend direction, data stability, and comparisons between baseline and intervention phases.

RESULTS

The effectiveness calculation was conducted using a Single Subject Research (SSR) multiple baseline approach to demonstrate changes in both expressive and receptive language skills through the implementation of the RDTT instructional model. The study employed an A–B–A design and utilized visual graph analysis techniques. The analysis aimed to identify and evaluate changes in expressive and receptive language skills among children with autism spectrum disabilities following the intervention.

Tabel 4.9 Expressive skill data

Week	Subject 1	Subject 2	Subject 3
1	13	18	19
2	18	19	21
3	21	20	22
4	17	18	23
5	19	22	25
6	19	20	24
7	20	20	25
8	21	21	22
9	22	21	25
10	23	22	26
11	24	24	27

Week	Subject 1	Subject 2	Subject 3
12	26	25	28
13	25	26	27
14	26	28	27
15	27	30	28

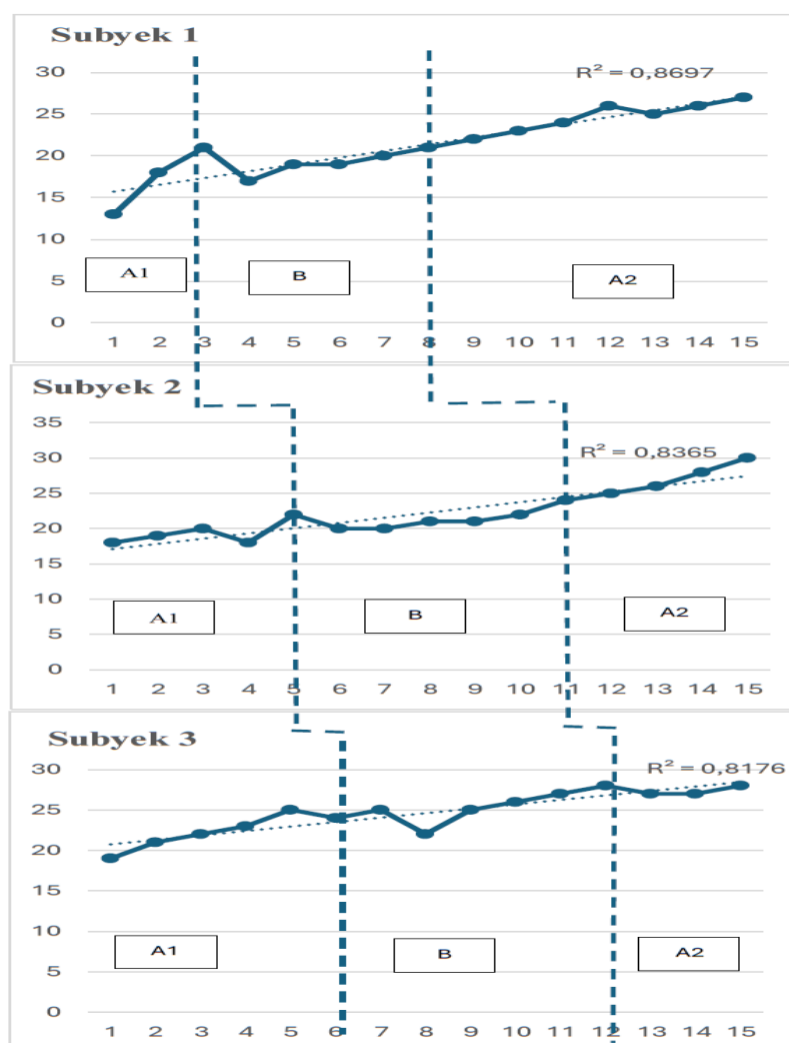


Figure 1. Tren expressive skill language

The participants in this study consisted of three children with autism enrolled at SD Labschool Universitas Negeri Malang. Each participant demonstrated different baseline characteristics, particularly in relation to expressive and receptive language skills. The following section presents the findings for each participant to measure the degree of change in expressive and receptive language skills after the implementation of the treatment.

For Subject 1, the baseline phase (A1) showed a slope estimate of +4, indicating a stable increase in expressive and receptive language skills prior to the intervention, with an average gain of approximately one point

per week. During the intervention phase (B), the slope was +0.90, suggesting no substantial increase or decrease, as scores tended to stabilize following an initial level jump. The average scores during this phase were relatively stagnant. In the second baseline phase (A2), Subject 1 demonstrated a positive slope of +0.79, reflecting gradual improvement despite minor fluctuations. The highest score (27) was achieved during this phase. This finding suggests that the expressive and receptive language skills taught were likely internalized and continued to develop independently. The R^2 value of 0.8697 indicates that 86.97% of the variance in expressive language improvement can be attributed to the intervention, representing a large effect size according to Cohen (1988).

For Subject 2, the baseline (A1) slope was +0.1. During the intervention phase, the slope increased to +0.39, indicating continued improvement, although at a slightly moderated rate compared to earlier growth. In the A2 phase, the slope reached +1.70, demonstrating strong maintenance and consistent high performance. The R^2 value of 0.8365 indicates an 83.65% contribution of the intervention effect, categorized as large.

For Subject 3, the baseline (A1) slope was +1.4. During the intervention phase, the slope was +0.71, indicating a strong upward trend similar to the baseline rate. Despite temporary fluctuations, Subject 3 achieved the highest score (28) during this phase. In the A2 phase, the slope was +0.5, showing sustained maintenance of high-level performance (scores ranging from 25–28) after the intervention was withdrawn. The R^2 value of 0.8176 reflects an 81.76% intervention effect, also classified as large.

Overall, the average R^2 value across participants was 0.8532, indicating a strong and substantial effect. Based on Cohen's (1988) criteria ($r^2 = 0.25$ large; 0.09 medium; 0.01 small), it can be concluded that the optimization of interactive learning assistance strategies had a significant and large impact on improving expressive language skills in children with autism.

DISCUSSIONS

This study involved three participants, and the effect size for each individual was calculated using R^2 analysis. The R^2 values were 0.8471 for Subject 1, 0.8606 for Subject 2, and 0.8521 for Subject 3. These results indicate a consistent upward trend in expressive language skills across all participants, with an average R^2 value of 0.8532. Referring to Cohen's (1988) interpretation of effect size—where $r^2 = 0.25$ is categorized as "large," $r^2 = 0.09$ as "medium," and $r^2 = 0.01$ as "small"—it can be concluded that the implementation of the RDTT instructional model exerted a large effect on improving the expressive language skills of children with autism spectrum disabilities.

Expressive language in children with autism refers to the verbal use of words and language to communicate concepts or thoughts. According to Frost et al. (2024), as cited in Samsiah (2012, p. 12), expressive language in individuals with autism involves the expression of feelings and sentences through structured language. Language consists of words used within a community and the rules governing their variation and combination.

In general, humans rely on language to communicate with others, including speaking, listening, reading, and writing (Santrock, 2011). Receptive language in individuals with autism refers to the ability to understand messages conveyed by others (Demchak, Elquist, & Rickard, 2002; Expressive Communication Help Organization [ECHO], 2003). Language impairments may result from peripheral or structural disturbances, including underdeveloped pulmonary function, oral-motor dysfunction (involving the tongue, cheeks, and jaw), and sensory system impairments (Maljaars et al., 2012).

CONCLUSION

Based on the findings obtained through the Single Subject Research (SSR) multiple baseline design involving three children with autism, it can be concluded that the interactive learning assistance strategy proved effective in improving expressive language skills. The improvement was evidenced by positive level changes, upward trends, increased data stability during the intervention phase, and minimal overlap between the baseline and intervention phases.

The changes occurred consistently following the implementation of the intervention for each participant, indicating a strong functional relationship between the treatment and the observed behavioral improvements. Qualitatively, the children demonstrated enhanced ability to construct sentences, respond to open-ended questions, and initiate as well as maintain conversations. Therefore, the interactive approach is highly recommended for application in inclusive educational settings to optimize the communication skills of children with autism.

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