Evaluating an ABA-Based Early Stimulation Program for Children with Speech Delay in a Resource-Limited Indonesian Kindergarten: A CIPP Model Approach

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Abstract

Speech delay among preschool children increased significantly at TK St. Fransiskus Assisi Sangatta, from 2 cases (2021-2022) to 9 cases (2023-2024). This study evaluated the implementation of an Applied Behavior Analysis (ABA)-based early stimulation program for children with speech delay using the CIPP (Context, Input, Process, Product) model. A qualitative evaluative research was conducted on five children aged 4-5 years who participated in the program for at least one year. Data were collected through structured observations, questionnaires distributed to parents, teachers, and stimulation providers, semi-structured interviews, and analysis of children's developmental documentation. Context evaluation revealed the program aligned with the institution's inclusive needs. Input evaluation exposed resource limitations with only two ABA-trained staff and limited facilities. Process evaluation demonstrated systematic implementation of Discrete Trial Training 3-4 times weekly, despite challenges in attendance consistency and parental involvement. Product evaluation showed all participants achieved significant progress, particularly in receptive language skills, with optimal outcomes in children receiving consistent parental support. The ABA program effectively improved language development in children with speech delay in resource-limited educational settings, but requires enhanced professional training, material support, and structured parental involvement for optimal outcomes.

INTRODUCTION

Language development represents a fundamental aspect of early childhood growth, serving as the primary medium through which children communicate their needs, interact with their environment, and construct knowledge. Delays in speech development can significantly impair a child's ability to form social connections, participate in academic activities, and regulate emotional responses, potentially leading to long-term developmental consequences if left unaddressed (McLaughlin, 2011; Schoon et al., 2010). McCormack et al. (2011) demonstrated that communication impairments in early childhood are significantly associated with reduced participation in life activities during later developmental stages. The prevalence of speech delay among preschool-aged children has emerged as a growing concern in educational settings worldwide, with estimates suggesting that approximately 5-10% of children aged 2-3 years experience some form of language delay (Law et al., 2000; Shriberg et al., 1999). Campbell et al. (2003) identified multiple risk factors for speech delay of unknown origin, emphasizing the complexity of early identification and intervention.

At TK St. Fransiskus Assisi Sangatta in East Kalimantan, Indonesia, a marked increase in speech delay cases has been documented over recent years. Enrollment data reveals a troubling trajectory: from 2 identified cases among 101 students in the 2021-2022 academic year to 9 cases among 125 students by 2023-2024. This threefold increase within three years signals an urgent need for systematic intervention strategies tailored to address developmental speech delays in early childhood educational contexts. The situation is further complicated by limited access to professional therapeutic

services in the region and the rejection of these children by other educational institutions, positioning TK St. Fransiskus Assisi as a critical provider of inclusive educational support.

Speech delay, particularly when associated with broader developmental disorders, extends beyond simple articulation difficulties to encompass challenges in language comprehension, sentence construction, and functional communication. Children with developmental speech delays often exhibit concurrent difficulties in cognitive, motor, and social-emotional domains, necessitating comprehensive, evidence-based intervention approaches. Early detection and intervention during the critical period of early childhood development can substantially mitigate both immediate and long-term impacts, facilitating improved language acquisition and overall developmental outcomes (Wallace et al., 2015; Dawson, 2008). Law et al. (2004) conducted a meta-analysis demonstrating the efficacy of treatment for children with developmental speech and language delay, while Roberts and Kaiser (2011) highlighted the effectiveness of parent-implemented language interventions.

Applied Behavior Analysis has established itself as a scientifically validated methodology for addressing communication disorders in children with developmental delays. Multiple meta-analytic studies have confirmed the effectiveness of ABA-based interventions in early childhood, demonstrating significant improvements in language development, adaptive behavior, and social communication (Virués-Ortega, 2010; Makrygianni & Reed, 2010; Peters-Scheffer et al., 2011). Reichow and Wolery (2009) provided comprehensive synthesis supporting early intensive behavioral interventions, while Eldevik et al. (2009) confirmed moderate to large positive effects across multiple developmental domains. The systematic, individualized, and measurable nature of ABA interventions makes them particularly suitable for early childhood settings. Recognizing this potential, TK St. Fransiskus Assisi initiated formal ABA training through EDUFA Bandung and implemented a structured early stimulation program targeting children with speech delays.

Despite growing implementation of ABA-based interventions in early childhood settings, significant gaps remain in understanding how such programs function within resource-constrained educational environments, particularly in non-Western contexts. Most existing research focuses on clinical settings in developed countries (Alnemary et al., 2017; Samadi & McConkey, 2011), leaving questions about feasibility, adaptation, and outcomes in regular kindergarten environments underexplored. Sun et al. (2013) and Bello-Mojeed et al. (2014) highlighted the need for more research in diverse cultural and economic contexts, particularly in developing regions where access to specialized services remains limited.

This study addresses these gaps by conducting a comprehensive evaluation of the early stimulation program for children with speech delay at TK St. Fransiskus Assisi Sangatta, employing the CIPP evaluation model. The CIPP framework provides a holistic approach by examining Context, Input, Process, and Product dimensions, thereby enabling systematic assessment of program relevance, resource adequacy, implementation quality, and achieved outcomes (Zhang et al., 2011; Stufflebeam & Coryn, 2014). This evaluation model is particularly appropriate for educational programs as it facilitates both summative assessment and formative improvement, supporting evidence-based decision-making and continuous program development (Aziz et al., 2018).

This research aims to evaluate program implementation, assess human resources and facility support, examine the execution of ABA methods by parents, teachers, and stimulation providers, and determine program outcomes on language development among children with speech delay. The findings are expected to contribute practical insights for early childhood educators implementing similar interventions, provide evidence for program refinement, and inform policy discussions regarding inclusive education and early intervention services in resource-limited settings.

METHODS

This study employed an evaluative research design utilizing qualitative approaches to assess the effectiveness of an early stimulation program based on Applied Behavior Analysis for children with speech delay. The evaluation framework adopted the CIPP model, which systematically examined four

dimensions: Context, evaluating program relevance and needs assessment; Input, analyzing available resources and program design; Process, investigating implementation procedures and adherence to planned activities; and Product, measuring outcomes and impacts on children's language development. This comprehensive framework was selected to provide holistic insights into both program implementation and effectiveness, enabling identification of strengths and areas requiring improvement.

The research was conducted at TK St. Fransiskus Assisi Sangatta, East Kalimantan, Indonesia, from March to May 2025. Participants comprised five children aged 4-5 years diagnosed with speech delay who had been enrolled in the ABA-based stimulation program for a minimum of one year. These children represented the cohort showing developmental language delays identified through initial screening during new student enrollment. Additionally, the study involved three primary respondent groups: parents of participating children, who provided insights into home-based implementation and observed developmental changes; classroom teachers, who offered perspectives on program integration within regular educational activities; and stimulation providers, who directly delivered ABA interventions and monitored child progress.

Data collection employed multiple instruments to ensure comprehensive evaluation and triangulation. Direct observation utilized structured observation sheets to systematically document ABA technique implementation during stimulation sessions and classroom activities, focusing on instructional delivery, child responses, and reinforcement strategies. Questionnaires were distributed to parents, teachers, and stimulation providers to measure satisfaction levels and perceived effectiveness across the four CIPP dimensions, particularly emphasizing process and product aspects. Semi-structured interviews were conducted following questionnaire administration to explore deeper contextual understanding, with teachers interviewed regarding context and input dimensions, stimulation providers addressing contextual factors, and parents elaborating on product outcomes. Documentation analysis examined children's developmental records, weekly and monthly progress reports, and frequency data on verbal behaviors and stimulus responses.

Instrument validity was established through data triangulation, combining observations, interviews, and documentation to cross-verify findings and ensure consistency across multiple data sources. Reliability was enhanced through peer debriefing, wherein colleagues independently reviewed collected data from observations and interviews to confirm interpretations and minimize researcher bias. The instruments employed had been previously tested and validated in similar educational research contexts.

Data analysis followed a mixed-method approach, integrating quantitative analysis of questionnaire responses with qualitative analysis of interview transcripts and observational notes. Qualitative data underwent thematic coding to identify recurring patterns, challenges, and facilitating factors across the four CIPP dimensions. Quantitative data from questionnaires and developmental assessments were analyzed descriptively to establish progress indicators and satisfaction levels. Triangulation of findings from multiple sources strengthened the validity of conclusions, ensuring that interpretations were grounded in converging evidence from diverse stakeholder perspectives and data collection methods.

RESULTS AND DISCUSSION

Results

The evaluation of the early stimulation program using the CIPP model revealed comprehensive insights across four dimensions: Context, Input, Process, and Product. Each dimension provided critical information regarding program design, implementation, and outcomes for children with speech delay at TK St. Fransiskus Assisi Sangatta.

Context Evaluation

Context evaluation examined the program's relevance to identified needs and institutional readiness. Data from initial assessments and interviews with school leadership indicated that the

program emerged as a direct response to escalating speech delay cases, increasing from 2 children (2021-2022) to 9 children (2023-2024). Systematic identification procedures included Denver Developmental Screening Test administration during new student enrollment, informal classroom observations, and referrals to relevant professional services. Children exhibited characteristics including difficulty expressing basic needs, limited vocabulary development, and challenges comprehending simple instructions, significantly impacting daily interactions.

Interview data with the school principal revealed that program urgency stemmed from both internal concerns regarding speech delay's impact on academic and social development, and external factors including rejection by other schools and minimal access to professional intervention services in Sangatta. Program objectives were collaboratively formulated among school leadership, teachers, and parents, focusing on developing basic communication skills (attending skills, imitation, receptive and expressive language), enhancing pre-academic competencies, and strengthening teacher capacity in ABA techniques. The program aligned with the school's inclusive mission to prioritize vulnerable populations, manifesting its commitment to serve children with special needs provided good cooperation with parents existed. However, institutional support remained largely internal, with limited government involvement in providing systematic training or resources.

Input Evaluation

Input evaluation assessed resource readiness supporting program implementation. Human resource analysis revealed that two core staff members—one classroom teacher and the school principal—completed ABA training at EDUFA Bandung, a private therapy institution. Knowledge acquired through this training was subsequently shared informally with eight other classroom teachers through internal sessions. The principal actively coordinated program activities, facilitated implementation monitoring, and conducted program evaluations. Despite these initiatives, most teachers lacked formal professional certification in ABA implementation, highlighting the need for more systematic capacity building.

Infrastructure comprised two simple stimulation rooms utilized for intervention sessions conducted 3-4 times weekly. Supporting materials included picture boards, various learning tools, reward media, and daily, weekly, and monthly journals documenting verbal behavior frequency and child responses to stimuli. However, resource limitations were evident in insufficient learning media tailored to individual child profiles, such as the absence of simple audio aids that could support children with speech motor difficulties.

Program structure followed systematic ABA principles: systematic and structured early intervention, individualized program adjustment according to each child's needs, skill target development following developmental stages, and collaboration with parents and teachers in program design and implementation. The primary intervention technique employed was Discrete Trial Training, comprising three components: clear instruction delivery, child response observation, and immediate appropriate feedback provision. Parent involvement was generally positive, with families willing to apply basic ABA principles at home and participating in simple orientation sessions. Communication between parents and teachers remained active, particularly regarding challenges faced and child progress reporting. Nevertheless, home-based implementation encountered significant constraints related to consistency and parental time limitations, with variations in practice influenced by educational background differences, training material comprehension, and daily responsibilities restricting active involvement.

Process Evaluation

Process evaluation examined actual program implementation, adherence to planning, and challenges encountered. The ABA program followed structured procedures beginning with initial identification through Denver Test screening to determine delayed developmental aspects and calculate developmental age gaps. For instance, a child demonstrating 10-month language ability at

24 months chronologically required program enrollment. Target determination occurred gradually, focusing on single words until mastery before advancing to subsequent targets.

Implementation followed a systematic DTT structure across 3-4 weekly sessions lasting 45 minutes each, flexibly adjusted to child conditions. Table 1 presents the implementation schedule and assessment system employed throughout the program.

Table 1. DTT Implementation Schedule and Assessment System

Component	Description
Session Frequency	3-4 times per week
Session Duration	45 minutes
Assessment Symbols	+ (correct), x (incorrect), P (prompt provided), - (no response)
Mastery Criterion	Three consecutive days of correct responses (+++)
Target Progression	Single word mastery before advancing to next target

DTT sessions followed systematic steps: instruction delivery (e.g., "What is this?" while showing image/bathing equipment), child response observation, and reinforcement provision (correct responses received praise plus rewards such as brief block play; incorrect responses received prompt assistance and repetition). For example, targeting the word "bath," the teacher would ask "What is this?" while showing soap images. If the child remained silent, prompt "ba...th" was provided. Upon correct response "bath," immediate praise "Excellent!" was given with permission to touch the soap. Documentation recorded daily scores (e.g., xp+++ indicating one error, one prompt, followed by three consecutive correct responses).

Observational data and teacher reflections revealed several implementation challenges. Child attendance inconsistency due to health conditions or insufficient parental understanding of session consistency importance affected program continuity. Teacher fatigue from balancing regular teaching duties with individual ABA program delivery posed additional difficulties. Some children resisted structural approaches, particularly those with sensory disorders, while teachers struggled developing reinforcement variations when child motivation fluctuated. To address these challenges, several adjustments were implemented: session timing modifications to avoid conflicts with regular activities, moral support provision to teachers through peer task sharing, parent involvement in home-based skill generalization through simple homework sheets, and functional communication training application as variation for children not responding well to DTT.

Product Evaluation

Product evaluation measured program outcomes on children's language development. Table 2 presents comprehensive developmental progress data for the five participating children, documenting stimulation duration, receptive and expressive language achievements, and overall developmental conclusions.

All five children demonstrated significant progress, particularly in receptive language skills. Children successfully followed simple instructions, recognized concrete objects, fruit pictures, transportation modes, and various other categories. In expressive language, most children began demonstrating word imitation abilities, expressing simple requests, and naming objects or categories, although not all could express desires completely or spontaneously. More optimal development was observed in children receiving consistent parental support at home, while children with limited accompaniment showed slower progress, especially in expressive skills.

Complementing developmental data, interview responses from parents provided nuanced perspectives on program effectiveness and implementation challenges. Parents of Child A expressed high satisfaction with program guidance provided by stimulation providers, consistently and patiently continuing school activities into home routines. Concerned that inconsistency might cause drastic developmental regression, parents committed to maintaining positive reinforcement whenever appropriate child responses occurred. Parents of Child B acknowledged significant child progress but

recognized home accompaniment constraints due to differing parenting patterns between mother and father. The working mother could not directly accompany the child, while the stay-at-home father was perceived as less consistent in following guidance and stimulus routines.

**Table 2.** Language Development Progress of Children with Speech Delay

Child	Duration	Receptive Language	Expressive Language	Development Summary
Child A	8 months	Follows one-step instructions (throw trash, get tissue, stomp feet); identifies concrete objects (plate, spoon, doll, toy car), fruit pictures (apple, orange, papaya), transportation (car, motorcycle, airplane), clothing (shirt, shoes, bag); objects & environmental sounds	Requests objects with simple words: "that...cake"; calls "Mama," "Papa"; imitates 1-2 syllables: "want eat"; imitates song lyrics	Positive development; child demonstrates understanding and basic language expression. Consistent parental support evident
Child B	1 year	Follows one-step instructions (throw trash, put in closet, sit); identifies body parts (head, foot, ear), picture objects (plate, doll, phone), concrete objects, fruits (apple, watermelon), transportation (car, bus); follows verb commands	Imitates two syllables: "want drink"; names & points body parts: "eyes," "cheeks"; labels verbs and categories (fruits, animals, clothing, family members)	Significant development, though expressive abilities not yet optimal. Parents fairly consistent, but attendance limited
Child C	8 months	Follows one-step instructions (throw trash, turn on light, get tissue); identifies body parts (chin, thigh), concrete objects, fruits (durian, melon), transportation (horse cart, helicopter), clothing; verb pictures, environmental objects, possession	Imitates 2-3 syllables; requests objects with incomplete speech: "wan...to...tha"; names body parts by function; labels various categories (musical instruments, family); says & returns greetings	Highly significant development in receptive & expressive domains. Parents demonstrate strong understanding and program support
Child D	3 years	Follows one-step instructions (throw trash, put in closet, get tissue); identifies concrete objects, fruits (apple, papaya), transportation (car, motorcycle), clothing (jacket, pants), environmental objects	Spontaneously requests with simple words; calls parents from distance; imitates 1-2 syllables	Significant development; expressive abilities not yet optimal. Parental consistency emerged only in final year
Child E	1 year	Follows one-step instructions (throw trash, turn on light, stomp feet); identifies body parts, concrete objects (glass, pencil), vegetable pictures (chili, carrot), fruits (grapes, watermelon), transportation (train, ship), clothing, verbs, environmental objects & sounds	Imitates two syllables; calls parents; names body parts, fruit categories, animals, transportation; labels family members from photos	Significant development; expressive abilities not yet optimal. Parents inconsistent with limited attendance

Parents of Child C found the school program highly satisfactory despite incomplete activity participation due to time limitations from frequent out-of-town travel. Contrasting parenting principles—overly indulgent father versus overly strict mother—caused inconsistent home-based program implementation. Nevertheless, the child adapted easily with school stimulation providers, demonstrating high compliance and enthusiasm, ensuring positive school program impact. Parents of Child D expressed gratitude for the stimulation program, noting that before enrollment, the child showed no responses except tantrums. After routine program participation, significant developmental progress emerged. Relief came from finally finding a school matching child needs, though notable progress appeared only in the final year, coinciding with increased parental involvement in home-based program repetition and supporting book provision.

Parents of Child E considered the program excellent and helpful in demonstrating substantial child progress, though implementation remained suboptimal. Primary obstacles included frequently disrupted child health and irregular sleep patterns, causing often-missed scheduled stimulus sessions. Consequently, children frequently lacked focus or felt drowsy during school activities, preventing maximum progress despite existing development due to incomplete and inconsistent program participation.

Teacher perspectives across the four CIPP dimensions provided additional implementation insights. Regarding context, teachers generally perceived the ABA program as appropriate for children's needs, supporting communication enhancement, though involvement in program planning remained limited. Concerning input, teachers considered human resources and facilities adequate, with trained stimulation providers supporting child development, though information about ABA was often obtained through independent sources rather than systematic institutional training. In process evaluation, teachers reported good implementation with simple instructions, positive reinforcement, rewards, and parent coordination, though some children required further instruction simplification. Product assessment revealed varied outcomes: some children showed increased ability following instructions and developing communication, while others still faced challenges in active communication and social-emotional control, necessitating more intensive strategies and accompaniment.

Stimulation provider assessments quantified individual child progress using structured evaluation criteria. Figure 1 presents comparative scores across five participating children, with ratings spanning from 2.6 (lowest) to 3.6 (highest) on a four-point scale.
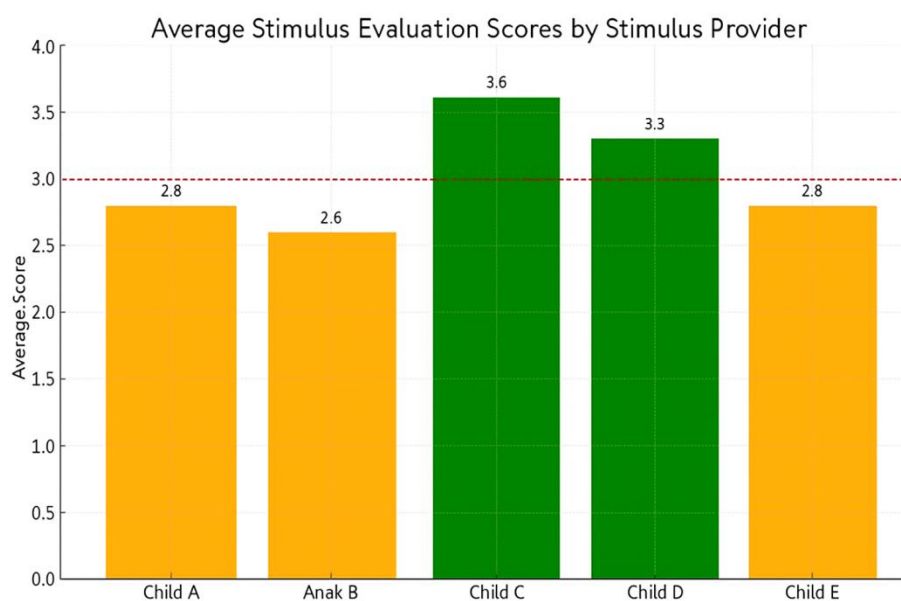
Figure 1. Stimulation Provider Evaluation Scores for Participating Children

Child C achieved the highest score (3.6), demonstrating ability to speak in simple sentences, play with peers, understand instructions well, and exhibit balanced fine and gross motor development. Excellent teacher-parent communication with consistent progress reporting contributed to this achievement. Child D showed stable, even improvement (3.3), demonstrating sentence articulation ability, peer interaction, good motor skills, and verbal command comprehension with emerging behavioral focus and consistency. Child B received the lowest score (2.6), still facing various stimulation challenges including insufficient focus, unstable motor and verbal abilities, incomplete command comprehension, and requiring extra accompaniment with room for improved teacher-parent communication. Children A and E both scored moderately (2.8), showing enthusiasm and some

progress but facing challenges in verbal communication and social interaction consistency, requiring additional strategies and routine motivation for more maximal development.

Discussion

The evaluation findings demonstrate that the ABA-based early stimulation program at TK St. Fransiskus Assisi Sangatta achieved significant positive outcomes in addressing speech delay among participating children, while simultaneously revealing critical implementation challenges requiring attention. These results align with existing literature emphasizing both the effectiveness of ABA interventions and the complexity of implementation in resource-limited settings.

The documented improvements in receptive and expressive language abilities among all five participating children corroborate the substantial body of evidence supporting ABA-based interventions for communication disorders. The meta-analytic findings of Virués-Ortega (2010) and Peters-Scheffer et al. (2011) demonstrated significant positive effects of ABA interventions on language development, consistent with the present study's outcomes showing children's enhanced ability to follow instructions, recognize objects and categories, and produce functional speech. The systematic application of Discrete Trial Training, the primary technique employed in this program, aligns with established ABA methodologies proven effective in breaking down complex skills into manageable components, facilitating skill acquisition through structured repetition and reinforcement (Reichow & Wolery, 2009).

Particularly noteworthy is the finding that receptive language skills developed more rapidly and comprehensively than expressive abilities across all participants. This pattern mirrors typical language development trajectories and supports Law et al.'s (2004) meta-analysis indicating that comprehension precedes production in speech and language interventions. The varied developmental rates observed among participants—with Child C demonstrating the most substantial progress and Child B showing more limited gains—reflect the individualized nature of developmental trajectories and underscore the importance of tailoring interventions to each child's unique profile, a core principle emphasized in contemporary ABA literature (Eldevik et al., 2009).

The study findings strongly emphasize parental involvement as a critical mediating factor in intervention effectiveness, directly supporting Roberts and Kaiser's (2011) meta-analysis demonstrating that parent-implemented language interventions yield significant positive effects. Children whose parents consistently applied ABA principles at home (notably Child C) showed markedly superior outcomes compared to those with limited or inconsistent parental engagement (Child B and Child E). This finding underscores the necessity of skill generalization beyond clinical or educational settings into natural environments where children spend most of their time.

However, the identified challenges in maintaining consistent home-based implementation—including time constraints, differing parenting approaches between caregivers, and varying levels of training comprehension—highlight a critical gap between research recommendations and practical feasibility in real-world contexts. While the literature extensively documents the importance of parental involvement (Wallace et al., 2015; Dawson, 2008), fewer studies adequately address the structural barriers families face in low-resource settings where parents may lack time, education, or support systems necessary for consistent implementation. This gap is particularly pronounced in non-Western contexts, as noted by Samadi and McConkey (2011) in their work on autism interventions in developing countries, where family structures, economic pressures, and cultural norms may differ substantially from settings where most ABA research has been conducted.

The input and process evaluations revealed significant resource limitations that potentially compromised implementation fidelity and program scalability. Only two staff members received formal ABA training, with knowledge transferred informally to colleagues—a practice that, while pragmatic, raises concerns about intervention consistency and quality. This finding resonates with the broader literature on ABA implementation challenges in educational versus clinical settings, where specialized expertise and supervision are typically more limited (Alnemary et al., 2017).

The absence of professional specialists such as speech-language pathologists, developmental pediatricians, or Board Certified Behavior Analysts represents a substantial deviation from ideal ABA implementation standards documented in Western clinical contexts. Makrygianni and Reed (2010) emphasized that intervention intensity and professional expertise significantly influence outcomes, suggesting that the modest progress observed for some children in this study may reflect not only individual differences but also limitations in program intensity and professional support available.

Infrastructure constraints, including limited therapeutic materials, inadequate stimulation spaces, and insufficient adaptive equipment for children with specific sensory or motor needs, further compromised optimal implementation. These material limitations contrast sharply with resource-rich settings where ABA interventions are typically studied and implemented, highlighting the contextual challenges identified by Sun et al. (2013) and Bello-Mojeed et al. (2014) regarding intervention implementation in diverse economic and cultural contexts.

Despite resource constraints, the program's sustained operation and documented impacts reflect strong institutional commitment to inclusive education principles. The school's refusal to reject children with developmental delays, alignment of the ABA program with its mission to prioritize vulnerable populations, and investment in teacher training despite limited funding demonstrate values-driven leadership that compensates partially for material and human resource limitations. This finding suggests that institutional culture and leadership commitment constitute critical enabling factors for intervention implementation in resource-limited settings, a dimension deserving greater attention in implementation science research.

The collaborative program development process involving school leadership, teachers, and parents exemplifies participatory approaches increasingly recognized as essential for sustainable intervention implementation, particularly in non-Western contexts where top-down models may be less culturally appropriate or practically feasible (Samadi & McConkey, 2011). However, the finding that teachers felt inadequately involved in planning stages indicates that participatory processes remained incomplete, potentially affecting teacher ownership and implementation fidelity—factors identified as crucial in educational intervention success.

The utilization of the CIPP evaluation model proved highly effective in providing comprehensive, multidimensional insights into program functioning. Consistent with Zhang et al. (2011) and Stufflebeam and Coryn (2014), the CIPP framework facilitated systematic examination of program context, resource inputs, implementation processes, and outcomes, enabling identification of specific strengths and weaknesses across the program lifecycle. This comprehensive approach contrasts with outcome-only evaluations that may overlook critical implementation factors affecting program effectiveness and sustainability.

The context evaluation revealed appropriate needs identification and program alignment with institutional mission, while input evaluation exposed significant resource gaps requiring attention. Process evaluation documented both adherence to planned procedures and necessary adaptations addressing emerging challenges, demonstrating program flexibility and responsiveness. Product evaluation confirmed positive outcomes while acknowledging variability across participants related to identified contextual and input factors. This multilevel analysis exemplifies the CIPP model's utility for formative evaluation supporting continuous program improvement, as advocated by Aziz et al. (2018) in educational settings.

Several practical implications emerge from this evaluation. First, while ABA-based interventions demonstrate effectiveness even in resource-limited settings, optimal outcomes require systematic attention to implementation fidelity, professional training, and adequate material resources. Institutions implementing similar programs should prioritize formal certification training for all staff involved, rather than relying on informal knowledge transfer, to ensure intervention quality and consistency.

Second, structured parent training and ongoing support systems are essential for maximizing intervention effectiveness. Programs should incorporate regular parent education sessions, provide

clear written guidance for home activities, establish accountability mechanisms encouraging consistency, and address structural barriers families face in implementing recommendations. Creating parent support groups may help address challenges and foster peer learning and mutual encouragement.

Third, advocacy for government support in providing systematic training, funding, and specialist access is crucial for program sustainability and scalability. The current reliance on internal school resources, while demonstrating impressive commitment, is ultimately unsustainable and inequitable. Policy initiatives should support inclusive education through funding allocations, specialist service provision, and teacher professional development opportunities in evidence-based interventions like ABA.

Several limitations warrant acknowledgment. The small sample size (five children) and single-site focus limit generalizability to other contexts, though they provide rich descriptive data valuable for understanding implementation processes. The absence of a control group precludes definitive causal claims about program effectiveness, as observed improvements might partially reflect natural developmental maturation. Future research should employ quasi-experimental designs comparing outcomes between children receiving ABA interventions and those receiving standard educational support.

The evaluation period (March-May 2025) captured a limited timeframe, preventing assessment of long-term intervention effects or sustainability of gains after program completion. Longitudinal studies tracking children's developmental trajectories over multiple years would provide crucial insights into intervention durability and identify factors predicting maintenance of treatment gains, addressing the concern raised by McLaughlin (2011) and Schoon et al. (2010) regarding long-term impacts of early speech delays.

Additionally, the study did not systematically measure implementation fidelity through structured observation protocols or independent assessment, relying instead on self-reports from teachers and stimulation providers. Future research should incorporate objective fidelity measures to better understand the relationship between implementation quality and child outcomes. Comparative studies across multiple sites varying in resource availability, geographic location, and cultural context would illuminate how contextual factors influence implementation and effectiveness, addressing the research gap identified by Alnemary et al. (2017) regarding intervention adaptation in diverse settings.

In conclusion, this evaluation demonstrates that ABA-based early stimulation programs can yield meaningful improvements in language development for children with speech delay even in resource-limited educational settings, provided strong institutional commitment exists. However, optimal outcomes require addressing critical gaps in professional training, material resources, and systematic parent support. The findings underscore the importance of comprehensive, multidimensional program evaluation for identifying implementation challenges and informing evidence-based improvements. As inclusive education initiatives expand globally, understanding how to effectively adapt and implement evidence-based interventions in diverse contexts becomes increasingly critical for ensuring equitable access to quality services for all children with developmental needs.

CONCLUSION

This comprehensive evaluation of the ABA-based early stimulation program at TK St. Fransiskus Assisi Sangatta demonstrates that evidence-based interventions can be successfully implemented in resource-limited educational settings, yielding significant improvements in language development for children with speech delay. The CIPP evaluation framework effectively revealed program strengths including strong institutional commitment, appropriate needs identification, systematic intervention procedures, and positive developmental outcomes across all participants, particularly in receptive language skills. However, critical challenges emerged including limited professional training, inadequate material resources, inconsistent parental involvement, and teacher capacity constraints that potentially compromised implementation fidelity and optimal outcomes.

This study contributes to the growing but still limited body of research examining ABA implementation in non-Western, resource-constrained contexts, addressing the gap identified in existing literature that predominantly focuses on clinical settings in developed countries. The findings demonstrate both the adaptability and limitations of evidence-based interventions when implemented in regular kindergarten environments without extensive specialist support, providing valuable insights for practitioners and policymakers in similar contexts.

Practical implications emphasize the necessity of formal certification training for all involved staff, structured parent education and support systems, adequate material resource provision, and government policy support for inclusive education initiatives. Future research should employ longitudinal designs tracking long-term developmental outcomes, include control groups enabling causal inferences, incorporate objective implementation fidelity measures, and conduct comparative studies across multiple sites with varying resource levels and cultural contexts. Additionally, investigation of cost-effective strategies for scaling evidence-based interventions in low-resource settings would provide crucial guidance for expanding access to quality early intervention services, ultimately promoting more equitable educational opportunities for children with developmental delays across diverse global contexts.

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