

The Application of Speech Therapy to Overcome Speech Delays in Early Childhood in Inclusive Education



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Abstract

This study aims to evaluate the effectiveness of speech therapy in overcoming speech delays in early childhood. This study uses an experimental design with a control group, consisting of two classes: an experimental class that receives speech therapy and a control class that follows conventional methods. This study uses a quantitative approach with an experimental method, using a quasi-experimental design, specifically a non-equivalent control group design. The research population consisted of all students from both institutions. Statistical analysis was performed using SPSS software, and the findings were interpreted in relation to the research hypothesis and theoretical framework. The results showed that at the pretest stage, there was no significant difference between the two groups, and similarly, at the posttest stage, there was no significant difference between the experimental class and the control class. These comparable results show that the effectiveness of the application depends on the implementation and involvement of the teacher. This study highlights the need for further research to explore additional factors that may influence the effectiveness of speech therapy in overcoming speech delays in early childhood.

Keywords: Early Childhood; Speech Delay; Speech Therapy

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Introduction

Development is one of the crucial aspects of early childhood education. Development is a continuous process that occurs throughout life. Therefore, development is not only about cognition, but also other aspects, especially communication ¹. Language and communication development is a crucial aspect of early childhood growth, playing a significant role in shaping a child's social, cognitive, and emotional abilities ². The ability to speak allows children to interact with their surrounding environment. However, not all children achieve language development that aligns with their age milestones. One of the common challenges encountered is speech delay, where a child's speech ability falls below the average level for their age ³. According to data from the American Speech-Language-Hearing Association (ASHA), about 5-10% of early childhood children experience speech delay, which can have an impact on their social, emotional, and cognitive aspects in the future ⁴. Speech delay can hinder a child's communication ability, which in turn can affect their social relationships and learning processes ⁵. Therefore, it is important to detect signs of speech delay early so that appropriate interventions can be applied. In this case, the role of parents and educators is vital, particularly in providing optimal verbal stimulation to support language development in children ⁶.

¹ Novia Istiqomah and Maemonah Maemonah, "Konsep Dasar Teori Perkembangan Kognitif Pada Anak Usia Dini Menurut Jean Piaget," *Khazanah Pendidikan* 15, no. 2 (2021): 151–58, <https://doi.org/https://doi.org/10.30595/jkp.v15i2.10974>.

² Siti Nurjanah et al., "The Effect of Social Skill Training of Early Childhood Education During COVID-19 Pandemic," *Open Access Macedonian Journal of Medical Sciences* 10, no. G (2022): 607–12, <https://doi.org/10.3889/oamjms.2022.9677>; Peng Peng, "The Developmental Mutualism of Language Skills and Behavioral Problems: The Time-Sensitive Mediating Role of Social Skills," *Journal of Educational Psychology* 116, no. 6 (2024): 889–902, <https://doi.org/10.1037/edu0000899>; Margarita A Ariyan, "Socio-Emotional Development of Young Learners in a Foreign Language Class," 2022, <https://doi.org/10.15405/epsbs.2022.03.71>; Kinanti R Hayati et al., "Improving English Learning for Kindergarten Students Through Commma Application in New Normal Era," *International Journal of Eco-Innovation in Science and Engineering* 3, no. 01 (2022): 7–11, <https://doi.org/10.33005/ijeise.v3i01.44>; Sabarno Dwirianto, "Implementation of Information Communication Technology in Enhancing Early Childhood Language Development," *CDS* 2, no. 1 (2023): 35–42, <https://doi.org/10.58794/cerdas.v2i1.142>.

³ Raudhatul Jannah, Heny Djoehaeni, and Nur Faizah Romadona, "Upaya Orang Tua Dalam Menangani Anak Usia Dini Dengan Speech Delay," *Aulad: Journal on Early Childhood* 7, no. 3 (2024): 723–33, <https://doi.org/10.31004/aulad.v7i3.770>.

⁴ Abd Rahim Israwati Amir, Irvan Mustafa, Nurindah Purnama Sari, Nurhikmah, "Vitalitas Dan Subordinasi Bahasa Daerah Di Maluku," *Jurnal Lingue Bahasa, Budaya, Dan Sastra* 4, no. 1 (2022): 60–68, <https://doi.org/https://doi.org/10.33477/lingue.v5i1.5391>.

⁵ Vina Dawamatussilmi, Ahmad Khoiri, and Bambang Sugiyanto, "Implementasi Metode Artikulasi Melalui Pengenalan Huruf Vocal Pada Anak Berkebutuhan Khusus Speech Delay Di Paud Universal Agape Kids Wonosobo Tahun Ajaran 2023/2024," *LITERASI: Jurnal Pendidikan Guru Indonesia*, 2024, 66–72.

⁶ Kim Bettens, "A Protocol for a Randomized-controlled Trial to Investigate the Effect of Infant Sign Training on the Speech–Language Development in Young Children Born With Cleft Palate," *International Journal of Language & Communication Disorders*, 2023, <https://doi.org/10.1111/1460-6984.12920>; Laura Bentley et al., "A Translational Application of Music for Preschool Cognitive Development: RCT Evidence for

The causes of speech delay are diverse, including neurological disorders, hearing problems, or certain conditions like autism. For example, hearing impairments can hinder a child's ability to hear and respond to sounds, ultimately affecting their language development⁷. In addition to biological factors, the environment plays a significant role in a child's language development. Lack of verbal stimulation and social interaction at home can slow down a child's speech abilities⁸. Children who are rarely spoken to or engaged with by adults are more likely to experience speech delay. Therefore, parents and caregivers must create an environment that supports language development through activities like talking, reading, and playing together. By understanding the causes and impacts, appropriate intervention steps can be taken to help children overcome speech delay⁹. Early intervention in speech delay is critical because speech ability significantly influences a child's social, academic, and emotional development. One of the widely used intervention methods is speech therapy¹⁰.

Research indicates that approximately 5-10% of children experience delayed speech in early childhood¹¹. Speech therapy is an intervention approach designed to help children improve their communication skills through specific techniques, such as exercising mouth

Improved Executive Function, Self-regulation, and School Readiness," *Developmental Science*, 2023, <https://doi.org/10.1111/desc.13358>; Rasa Braslauskienė, Erika T E Turauskienė, and Jolanta V J Vaičiulienė, "Active Learning Methods in Developing Children's Language Skills at Pre-School Age: Teachers' Attitudes," *Regional Formation and Development Studies*, 2022, 29–42, <https://doi.org/10.15181/rfds.v37i2.2419>; "Exploring How Teachers Help Kids Talk Understanding Early Childhood Language Development," *SJLL*, 2023, <https://doi.org/10.62681/sprypublishers.sjll/1/1/3>; Nani Ronsani Thamrin and Endang Darsih, "An Analysis of Non-Verbal Communication in Students' Speaking Performance," *Kne Social Sciences*, 2023, <https://doi.org/10.18502/kss.v8i4.12979>.

⁷ Michelle M Florentine et al., "Disparities in Speech and Language Delay Among Children With Aural Atresia," *Ear & Hearing* 43, no. 5 (2022): 1574–81, <https://doi.org/10.1097/aud.0000000000001218>; Anika Hussain et al., "Sociocultural Factors Associated With Detection of ASD Among Culturally and Linguistically Diverse Communities in Australia," 2022, <https://doi.org/10.21203/rs.3.rs-2136713/v1>; Marília B d. Matos, Tiago S Bara, and Mara L Cordeiro, "Autism Spectrum Disorder Diagnoses: A Comparison of Countries With Different Income Levels," *Clinical Epidemiology* Volume 14 (2022): 959–69, <https://doi.org/10.2147/lep.s373186>; Çiğdem G Sel et al., "Clinical Range and Outcomes of Cerebral Cavernous Malformations in Pediatric Patients: A Single Center Data Results," 2022, <https://doi.org/10.21203/rs.3.rs-2147491/v1>; Fatma Y Çımar, "A Follow-Up Study of Children Diagnosed With Delayed Speech and Language," *Clinical and Experimental Health Sciences* 14, no. 1 (2024): 163–68, <https://doi.org/10.33808/clinexphealthsci.1256920>.

⁸ Neng Lina Nurfiana, A. Asriyanik, and Winda Apriandari, "Konsultasi Gangguan Terlambat Bicara (Speech Delay) Pada Anak Balita Menggunakan Metode Forward Chaining," *Jurnal Khatulistiwa Informatika* 11, no. 2 (2024): 118–27, <https://doi.org/10.31294/jki.v11i2.15842>.

⁹ Jannah, Djoehaeni, and Romadona, "Upaya Orang Tua Dalam Menangani Anak Usia Dini Dengan Speech Delay."

¹⁰ Herpiyana Ika, Hasanah Nor Izzatil, and Rusdiah, "Interaksi Sosial Anak Yang Memiliki Speech Delay," *Jurnal Smart Paud* 4, no. 1 (2021): 11–22.

¹¹ Afrinar Pramitasari et al., "Karcis-Delay Sebagai Media Terapi Wicara Pada Anak Dengan Gangguan Keterlambatan Bicara," *Indonesian Language Education and Literature* 10, no. 2 (2025): 324–37, <https://doi.org/http://dx.doi.org/10.24235/ileal.v10i2.16888>.

muscles, expanding vocabulary, and improving pronunciation and intonation ¹². Research has shown that speech therapy applied early can result in significant improvements in addressing speech delay. Various studies have revealed that speech therapy is effective in helping children with speech delay ¹³. One study shows that a full-day school program can enhance children's speaking abilities through intensive social interactions in the school environment. These interactions allow children to enrich their vocabulary and build better sentence structures. However, this study has not explored how similar methods can be applied to children without access to such facilities, especially in rural areas. Research at the Izzati Therapy Center in Sumedang Regency ¹⁴, also demonstrates that speech therapy tailored to a child's needs can significantly improve their speaking abilities. However, this study lacks exploration of the role of parents in supporting the therapy process. Both studies yielded positive results but did not fully consider the social and cultural factors that affect the success of therapy. Therefore, further research is needed to develop more inclusive therapy methods accessible to all groups.

¹² Agalyasri. G S, "Enhancing Vocabulary Instruction for Children With Speech and Hearing Impairments: The Role of Multiple Sensory Modalities," *Theory and Practice in Language Studies* 13, no. 10 (2023): 2429–38, <https://doi.org/10.17507/tpls.1310.01>; Armand S Nugraha and Nurcahya Sinaga, "The Relationship Between Speech Delay With Cerebral Palsies in Children at Rs Haji Medan," *Journal of Social Research* 2, no. 7 (2023): 2426–32, <https://doi.org/10.55324/josr.v2i7.1129>; Yasmin S Frazão et al., "Utilization of Electromyographic Biofeedback in Speech Therapy to Attenuate the Signs of Facial Aging: A Case Report," *Codas* 35, no. 3 (2023), <https://doi.org/10.1590/2317-1782/20232021161en>; Kacie Dunham-Carr, "The Processing of Audiovisual Speech Is Linked With Vocabulary in Autistic and Nonautistic Children: An ERP Study," *Brain Sciences* 13, no. 7 (2023): 1043, <https://doi.org/10.3390/brainsci13071043>; Hope S Lancaster et al., "A Meta-Analysis of the Relationship Between Speech and Language Development in Children With Nonsyndromic Cleft Palate With or Without Cleft Lip," 2023, <https://doi.org/10.31219/osf.io/6fyd8>.

¹³ Fadila Rahmah et al., "Penanganan Speech Delay Pada Anak Usia Dini Melalui Terapi Wicara," *As-Sibyan: Jurnal Pendidikan Anak Usia Dini* 8, no. 1 (2023): 99–110, <https://doi.org/10.32678/assibyan.v8i1.8279>.

¹⁴ Felcilya Anggia Mirantisa et al., "Komunikasi Terapeutik Berbasis Kartu (Flash Card) Pada Anak Dengan Gangguan Bicara (Speech Delay) Di Eka Hospital Pekanbaru," *Jurnal Keperawatan Abdurrah* 5, no. 1 (2021): 53–62, <https://doi.org/10.36341/jka.v5i1.1691>.

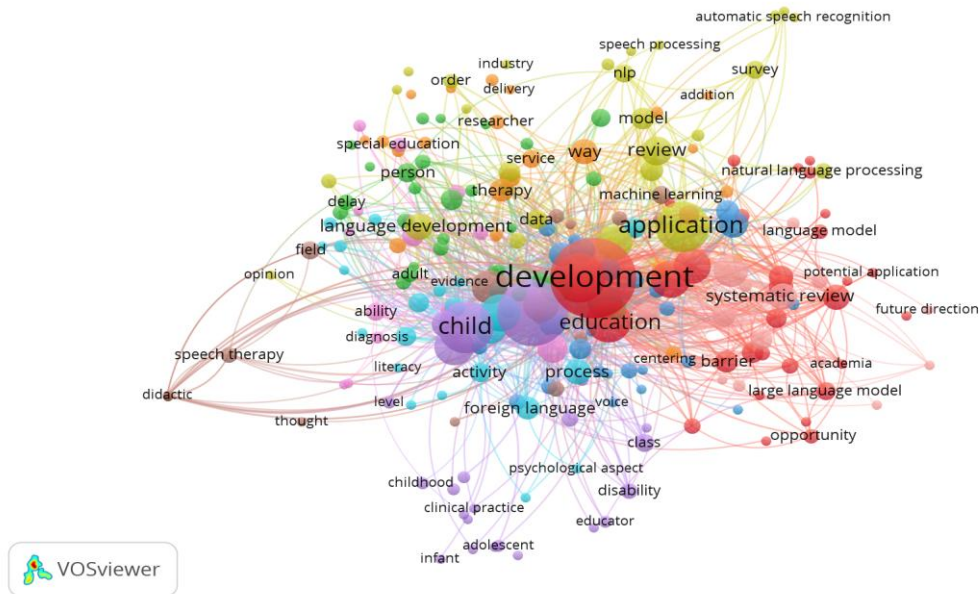


Figure 1. VOSviewer Results

The research gap in speech therapy for early childhood lies in the limited integration of technology in addressing speech delays, as indicated by the bibliometric analysis from VOSviewer. Most previous studies have relied on traditional therapeutic methods without incorporating advanced tools such as Natural Language Processing (NLP) and speech recognition. Furthermore, the weak correlation between "speech therapy" and "speech delay" in the bibliometric mapping suggests that targeted interventions for delayed speech development remain underexplored. Research in this field has also been predominantly theoretical or based on systematic reviews, with fewer studies focusing on practical applications. This highlights the need for innovative, technology-driven solutions that can be directly implemented in educational and clinical environments, providing accessible and effective support for parents, educators, and therapists.

The novelty of this study lies in the integration of Natural Language Processing (NLP) and speech recognition to develop an interactive and adaptive speech therapy approach specifically designed for young children. Unlike conventional interventions, this research leverages artificial intelligence to provide real-time feedback and personalized learning experiences. By integrating linguistic analysis with digital tools, it aims to enhance children's ability to recognize and articulate words more effectively. Additionally, this study prioritizes real-world implementation by developing a user-friendly application that can be seamlessly

incorporated into early childhood education and therapy sessions. The combination of language science, machine learning, and pedagogical strategies introduces a fresh perspective, bridging the gap between technology and speech development interventions in a way that has not been extensively explored.

Speech therapy has been widely recognized as an effective method for overcoming speech delay, but there are some gaps in its application ¹⁵. Most previous studies have focused on the effectiveness of speech therapy in formal settings, such as clinics or therapy centers. Meanwhile, approaches involving parents as part of the intervention have been less explored, even though parental involvement plays a crucial role in supporting the success of therapy. Additionally, there is still a lack of studies on modifying speech therapy based on local cultural contexts to provide a relevant and comfortable learning experience for children. This indicates the need for a more holistic and contextual approach to speech therapy, especially for early childhood children in family and school environments.

This study aims to explore the application of speech therapy in addressing speech delay in early childhood, focusing on the roles of education and family environment. The article highlights various therapeutic techniques that can be practically implemented by parents and educators, such as the use of educational games, phoneme repetition, and intensifying social interactions. Furthermore, this research seeks to identify the factors that support or hinder the implementation of speech therapy. With this approach, the study is expected to make a significant scientific contribution to improving the quality of speech therapy services, especially in the context of Indonesia.

Research Methods

This study employs a quantitative approach using an experimental method with a quasi-experimental design, specifically a non-equivalent control group design ¹⁶. The research involves two groups: an experimental group that receives speech therapy intervention and a control group that does not receive the intervention, serving as a comparison in addressing speech delay in early childhood. Since the quasi-experimental design does not include randomization, as seen in non-equivalent group designs, it is applied when research

¹⁵ Mujab Syaiful, "Jurnal Pendidikan Dan Konseling," *Jurnal Pendidikan Dan Konseling* 5, no. 1 (2023): 1349–58.

¹⁶ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D* (Bandung: Alfabeta, 2013).

conditions or circumstances do not permit full control over all variables. Characteristics of quasi-experimental designs include no full randomization, having comparison groups (i.e., experimental and control), using pretest and posttest measurements, and limited control. This research was conducted at RA Al-Huda and RA Al-Hasanah in West Bandung Regency, with the population being all students at RA Al-Huda and RA Al-Hasanah. The sample consists of 20 students from RA Al-Huda as the experimental class and 20 students from RA Al-Hasanah as the control class, with purposive sampling used for selection.

The data analysis technique in this study aims to process numerical data using statistical methods to test the hypothesis, with descriptive and inferential statistical analysis assisted by SPSS version 26. The data analysis process in the quantitative approach includes data preparation, assumption testing, selecting the appropriate analysis techniques, performing data analysis using SPSS software, and interpreting the research results in relation to the research hypothesis and theoretical context. Descriptive statistical analysis is used to describe data both graphically and numerically, with calculations of the mean, standard deviation, and frequency distribution to display the frequency of data occurrences in specific categories. The mean is a central tendency measure that represents the average value of a data set, while the standard deviation indicates the extent of data dispersion from the mean. A larger standard deviation signifies a greater spread of data, whereas a smaller standard deviation indicates that the data points are closer to the mean.

In this research, inferential statistical analysis includes the independent sample t-test, which is used to compare the means of two independent groups (experimental and control) before and after the intervention, ensuring validity and reliability. Additionally, the N-Gain test is applied to assess the effectiveness of the intervention by measuring the improvement between pretest and posttest scores. This test is particularly useful in quasi-experimental research, where pretest and posttest serve as key evaluation tools. The N-Gain test process involves collecting pretest and posttest data, calculating N-Gain scores, and categorizing them into low, moderate, or high levels. For the independent sample t-test, data processing requires that the variables be measured on an interval or ratio scale, with independent data groups. Normality testing is conducted using the Kolmogorov-Smirnov test, followed by a homogeneity test. If the data is normally distributed, parametric statistical analysis is performed using the t-test. However, if the data is not normally distributed, non-parametric statistical analysis is conducted using the Mann-Whitney U test.

Results and Discussion

This section presents the results of the research based on the activities conducted. The research results consist of quantitative data from the pretest and posttest scores in both the experimental and control groups. The quantitative data were processed using SPSS version 26 software. Based on the data processing, the results of the pretest using descriptive statistical tests are presented in the following table.

Table 1. Group Statistics Pretest

Class	Mean	Std. Deviasi	Std. Error Mean
Experimental	49.50	4.161	.930
Control	50.00	5.282	1.181

Based on the table above, it can be seen that the mean scores for the experimental and control classes are 49.50 and 50.00, with standard deviations of 4.161 and 5.282, respectively. The standard errors of the means for the experimental and control classes are 0.930 and 1.181. A normality test was then conducted on the pretest scores for both classes. To test the normality of the pretest scores, the Kolmogorov-Smirnov test was used with a significance level of $\alpha = 0,05$.

Table 2. Tests of Normality Data Pretest

Kelas	Statistic	Sig.
Experimental	.152	.200*
Control	.150	.200*

The table above shows that the significance value for both the experimental and control classes is 0.200. Since the significance value for both classes is greater than 0.05, H_0 is accepted according to the decision-making criteria. Therefore, it can be concluded that the pretest data for both the experimental and control classes are normally distributed.

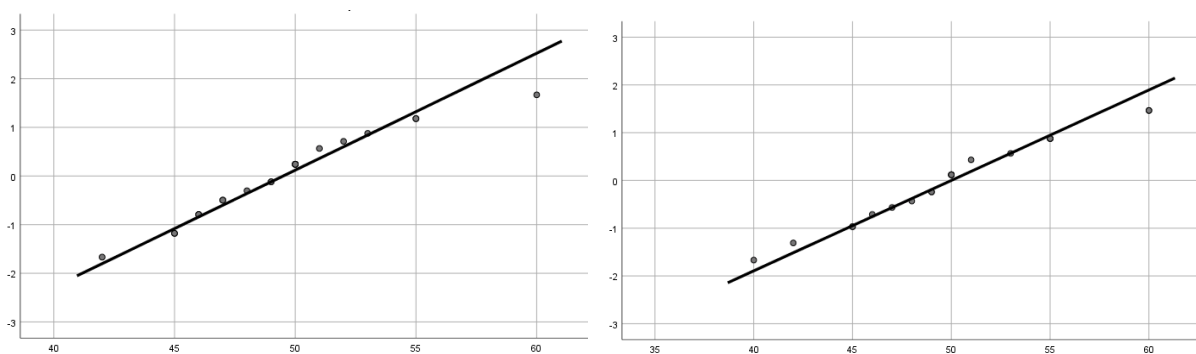


Figure 2. Normal Q-Q Plot of Pretest

Based on Figure 2 above, it can be seen that the data points for the pretest in both the experimental and control classes are spread around the diagonal line and are closely aligned with the line, indicating that the data are normally distributed. The next test conducted was the Levene's test.

Table 3. Tests of Homogeneity of Variance

	Levene Statistic	Sig.
Based on Mean	.671	.418
Based on Trimmed Mean	.670	.418

The table above shows that the significance value for "Based on Mean" is 0.418. Since the significance value is greater than 0.05, H_0 is accepted according to the decision-making criteria. Thus, it can be concluded that the variances of the two classes are homogeneous. A parametric statistical test was then performed using an independent samples t-test to determine the difference in pretest scores between the experimental and control classes.

Table 4. Independent Samples Test

	F	Sig. (2-tailed)
Equal Variances Assumed	.671	.741
Equal Variances Not Assumed		.741

Based on the table above, the significance value for "Equal Variances Assumed" is 0.741. Since the significance value is greater than 0.05, it indicates that there is no significant difference in the initial abilities of the experimental and control groups in addressing speech delay in early childhood. Next, data processing was performed on the posttest scores using descriptive statistical tests, presented in the table below.

Table 5. Group Statistics Posttest

Class	Mean	Std. Deviasi	Std. Error Mean
Experimental	77.70	4.105	.918
Control	78.25	4.822	1.078

Based on the table above, it can be seen that the mean scores for the experimental and control classes are 77.70 and 78.25, with standard deviations of 4.105 and 4.822, respectively. The standard errors of the means for the experimental and control classes are 0.918 and 1.078.

A normality test was then conducted on the posttest scores for both classes, using the Kolmogorov-Smirnov test with a significance level of $\alpha = 0,05$.

Table 6. Tests of Normality Data Posttest

Class	Statistic	Sig.
Experimental	.095	.200*
Controll	.108	.200*

The table above shows that the significance value for both the experimental and control classes is 0.200. Since the significance value for both classes is greater than 0.05, H_0 is accepted according to the decision-making criteria. Therefore, it can be concluded that the posttest data for both the experimental and control classes are normally distributed.

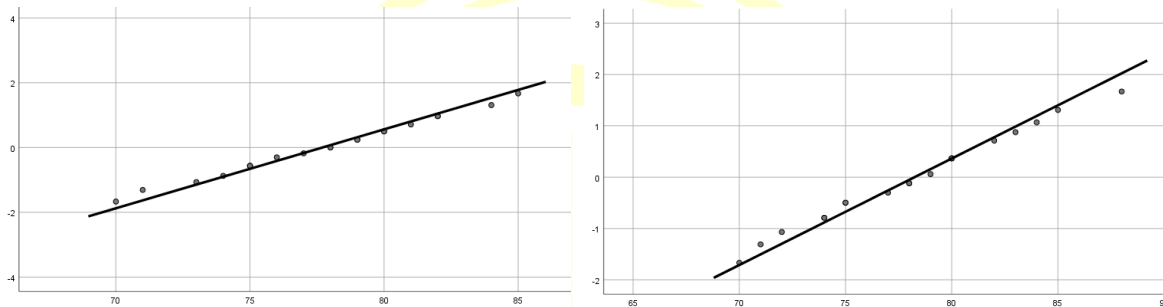


Figure 3. Normal Q-Q Plot of Pretest

Based on Figure 2 above, it can be seen that the data points for the posttest in both the experimental and control classes are spread around the diagonal line and are closely aligned with the line, indicating that the data are normally distributed. The next test conducted was the Levene's test.

Table 7. Tests of Homogeneity of Variance

	Levene Statistic	Sig.
Based on Mean	.422	.520
Based on Trimmed Mean	.424	.519

The table above shows that the significance value for "Based on Mean" is 0.520. Since the significance value is greater than 0.05, H_0 is accepted according to the decision-making criteria. Thus, it can be concluded that the variances of the two classes are homogeneous. A parametric statistical test was then performed using an independent samples t-test to determine the difference in posttest scores between the experimental and control classes.

Table 8. Independent Samples Test

	F	Sig. (2-tailed)
Equal Variances Assumed	.422	.700
Equal Variances Not Assumed		.700

Based on the table above, the significance value for "Equal Variances Assumed" is 0.700. Since the significance value is greater than 0.05, this indicates that the posttest mean score for speech therapy in the experimental class is not significantly better than the control class. Based on this, the N-Gain test was not conducted because the posttest data for both the experimental and control classes did not show a significant difference between speech therapy and conventional approaches in addressing speech delay in early childhood.

Based on the results outlined above, this study aims to evaluate the effectiveness of speech therapy in addressing speech delay in early childhood by comparing the experimental group, which received speech therapy, with the control group, which used a conventional method.

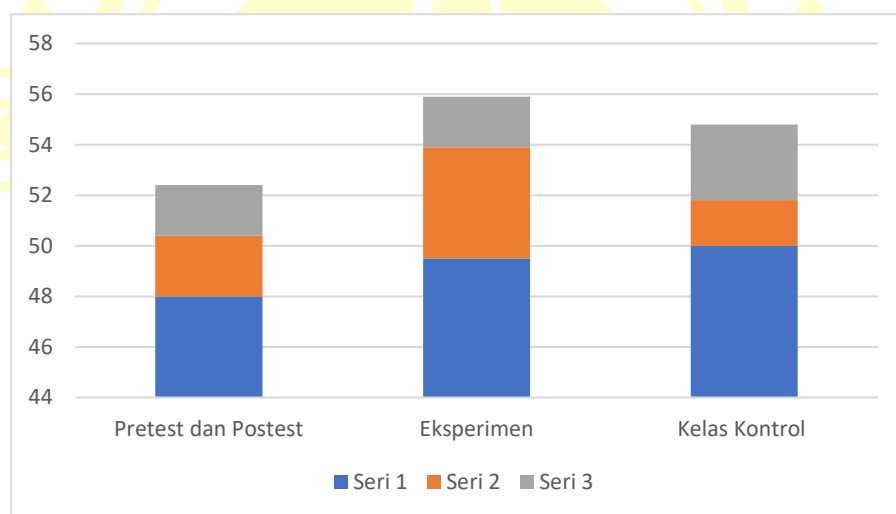


Figure 4. Comparison of Experimental and Control Class Scores

Based on the data analysis results from both the pretest and posttest, no significant differences were found between the two groups. At the beginning of the study (pretest), the average scores of the experimental and control groups were similar, with the experimental group scoring an average of 49.50 and the control group 50.00. The standard deviations were also relatively small (4.161 for the experimental group and 5.282 for the control group). The Kolmogorov-Smirnov normality test yielded a significance value of 0.200, which is greater than 0.05, indicating that both groups were normally distributed. Additionally, Levene's test

for homogeneity of variances showed a significance value of 0.418, also greater than 0.05, confirming that the variances of both groups were homogeneous.

These findings suggest that at the start of the study, there were no significant differences in the children's speaking abilities between the two groups, meaning that both the experimental and control classes had comparable initial language development conditions. At the posttest stage, the average scores in both groups increased significantly compared to the pretest results. The experimental group's average score rose to 77.70, while the control group reached 78.25, with standard deviations of 4.105 and 4.822, respectively. The Kolmogorov-Smirnov normality test for the posttest confirmed a normal distribution with a significance value of 0.200. Similarly, Levene's test for homogeneity of variances showed a significance value of 0.520, indicating that the variances of both groups remained homogeneous. Despite these improvements in posttest scores, the independent samples t-test revealed that the difference in mean posttest scores between the experimental and control groups was not statistically significant, with a significance value of 0.700. This suggests that speech therapy in the experimental class did not lead to significantly better outcomes compared to the conventional method used in the control class.

According to several experts, the success of speech therapy in addressing speech delay is heavily influenced by factors such as the duration of therapy, the frequency of therapy sessions, and the involvement of parents and the child's surrounding environment¹⁷. Speech therapy conducted in a limited time with low intensity may not yield optimal results.

¹⁷ "Effect of Music Therapy on Language Skills in Children With Specific Language Impairment: A Systematic Review," *Journal of Associated Medical Sciences*, 2024, <https://doi.org/10.12982/jams.2024.011>; Yee Yan Wong, "Parents Are the First Tutors of Their Child: Parents' Perception of Responsibility on Practicing Speech-Language Home Program During COVID-19 Lockdown," *Child Care Health and Development*, 2025, <https://doi.org/10.1111/cch.70038>; Zeinab Mohseni et al., "Voice Improvement Following Conventional Speech Therapy Combined With Singing Intervention in People With Parkinson's Disease: A Three-arm Randomised Controlled Trial," *International Journal of Language & Communication Disorders*, 2023, <https://doi.org/10.1111/1460-6984.12900>; Linda Perdana Wanti, "Utilization of Augmented Reality Technology in Independent Speech Therapy Applications," *Lontar Komputer Jurnal Ilmiah Teknologi Informasi*, 2024, <https://doi.org/10.24843/lkjiti.2024.v15.i01.p01>; Cassandra Alighieri et al., "The Retrospective Acceptability of High Intensity Versus Low Intensity Speech Intervention in Children With a Cleft Palate: A Qualitative Study From the Parents' Point of View Using the Theoretical Framework of Acceptability," *International Journal of Language & Communication Disorders*, 2022, <https://doi.org/10.1111/1460-6984.12788>; "The Development of Manual for Speech and Language Treatment for Parents of Children With Cleft Palate Ages 0-3 Years Old," *Journal of Associated Medical Sciences*, 2024, <https://doi.org/10.12982/jams.2024.007>; Ahmed Olaitan Lawal, "Parents' Knowledge, Perception, and Attitudes Towards Speech and Language Therapy Services of Individuals With Cerebral Palsy: A Quantitative Analysis," *Journal of Intellectual Disability - Diagnosis and Treatment*, 2024, <https://doi.org/10.6000/2292-2598.2023.11.05.4>; Lena D Alzahrani, "Prevalence and Risk Factors of Speech Delay in Children Less Than Seven Years Old in Saudi Arabia," *Cureus*, 2023, <https://doi.org/10.7759/cureus.48567>.

According to ¹⁸, structured speech therapy with a social communication-based approach is more effective in supporting language development in children with speech delays. On the other hand, the conventional method used in the control class also has certain approaches to improving children's language skills ¹⁹. While speech therapy is theoretically more focused on speaking skills, the conventional method, which involves play-based learning and social interaction, can indirectly help children improve their communication abilities ²⁰. Based on this theory, the lack of significant differences between the two groups can be explained by several factors, including the duration and intensity of therapy, as well as the type of method applied in the control class, which may also be effective in addressing speech delay, even without using a specialized approach like speech therapy.

Conclusion

Based on the research findings, it can be concluded that at the pretest stage, there were no significant differences between the experimental class, which received speech therapy, and the control class, which used a conventional approach, in addressing speech delay in early childhood. This is supported by statistical test results showing that the initial abilities of both classes were nearly identical, and the pretest data for both groups were normally distributed. Therefore, it can be inferred that both groups started with a similar level of ability in addressing speech delay. At the posttest stage, despite the implementation of speech therapy in the experimental class, statistical tests indicated no significant difference in the abilities of children in the experimental and control classes. The average posttest scores of both groups

¹⁸ Sainee Tamphu et al., "Building Bridges to the Future of Learning: Exploring Artificial Intelligence Research Using R-Studio Assisted Bibliometrics," *Cogent Education* 11, no. 1 (2024), <https://doi.org/10.1080/2331186X.2024.2417623>.

¹⁹ Rukanah Rukanah, Yuyun Farihatin, and Yunita D Fitriani, "Change of Language Development With Finger Puppets Stimulation in Children's Preschool," *Journal of Vocational Nursing* 3, no. 2 (2022): 116–19, <https://doi.org/10.20473/jovin.v3i2.39430>; Maggie Eising and Courtney Karasinski, "Developmental Kindergarten Classroom Intervention for Spatial Relational Terms," *Codas* 34, no. 6 (2022), <https://doi.org/10.1590/2317-1782/20212021176>; Annisa A Novara, "Dialogic Reading Strategy for Bilingual Child With Language Difficulties," *Jurnal Obsesi Jurnal Pendidikan Anak Usia Dini* 7, no. 6 (2023): 7041–52, <https://doi.org/10.31004/obsesi.v7i6.5451>; Elya marfu'atun, "Discrete Trial Teaching Method to Improve Receptive Language Skills in Children With Global Developmental Delay," *Special Special and Inclusive Education Journal* 4, no. 1 (2023): 19–26, <https://doi.org/10.36456/special.vol4.no1.a7106>; Deky Magay, "Improving Language Literacy Skills of 5 and 6-Year-Old Children Through Picture Story Method at School," *Qalamuna Jurnal Pendidikan Sosial Dan Agama* 14, no. 2 (2022): 617–30, <https://doi.org/10.37680/qalamuna.v14i2.3310>; Braslauskienė, Turauskienė, and Vaičiulienė, "Active Learning Methods in Developing Children's Language Skills at Pre-School Age: Teachers' Attitudes."

²⁰ S Perdina and B Prisuna, "Pelaksanaan Treatment Pada Anak Berkebutuhan Khusus: Speech Delay: Perlakuan," *Early Childhood: Jurnal Pendidikan* 8, no. 1 (2024): 58–72.

were also nearly identical, with the experimental class scoring an average of 77.70 and the control class 78.25. This suggests that, although speech therapy was applied in the experimental class, there was no significant improvement compared to the conventional approach in addressing speech delay in early childhood. Based on these results, it can be concluded that both speech therapy and the conventional approach produce comparable outcomes in addressing speech delay in early childhood. This study suggests that, while speech therapy is a widely used method to support children's speech development, in the context of this research, both approaches did not demonstrate significant differences in improving the speech abilities of children with speech delay. Therefore, further research is needed to explore other factors that may influence the effectiveness of these two methods.

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