

Received: August, 28 2026
Revised: September, 8 2026
Accepted: September, 24 2026
Published: September, 29 2026

Interactive Audiovisual Media Can Prevent Speech Delay in Preschool-Aged Children at Early Childhood Education Centers: A Case Study

Evania D Widyadhana^{1*}, Andi Hayyun Abiddin², Sri Mugianti³
^{1,2,3}Department of Nursing, Polytechnic of the Ministry Health Malang
Corresponding author: evaniadw30@gmail.com

ABSTRACT

Background: The development of children's speech skills is an important aspect that plays a role in growth and development, but speech delay is still a developmental problem that has an impact on communication, social, and psychological. There needs to be efforts to prevent speech delay through the provision of stimulation, one of which is using interactive audio-visual media. **Objective:** This study aims to determine the use of interactive audio-visual media as an effort to prevent speech delay in preschool-age children. **Methods:** Qualitative research with a case study design was carried out in March-April 2026 at the Early Childhood Laboratory of University of Malang in Blitar City. The research subjects consisted of 7 preschool children with dubious development categories based on KPSP. KPSP is the Pre-screening Questionnaire for Child Development developed by the Indonesian Ministry of Health., as well as supporting informants, namely parents/caregivers and teachers. Data collection was carried out through observation, in-depth interviews, and documentation studies. **Results:** The results of the study show that the use of interactive audio-visual media has a positive impact on children's speech development through the co-viewing method. There was an increase in KPSP scores in speech and language aspects from the range of 2-3 to 3-4, which was shown by improved vocabulary, clarity of articulation, question response, and communication. **Conclusion:** The use of interactive audio-visual media based on co-viewing is effectively used as an effort to prevent speech delay in preschool-age children.

Keywords: Speech delay; preschoolers; interactive audio-visual media; co-viewing; speech stimulation

Background

The development of speech skills in children is an important aspect that plays a role in children's growth and development [1]. Speech developmental delays have become a fairly common problem found in children [2]. Developmental problems remain an important public health concern among young children [3]. The prevalence of preschool-age children who experience symptoms of speech delay in Indonesia is 5-10% [4]. Based on the results of the implementation of Early Detection of Growth and Development of the Diploma III Nursing Study Program of the Ministry of Health of Malang at the Early Childhood Laboratory of University of Malang in Blitar City, it was found that 7 out of 180 children with doubtful categories were found. The causes of speech delay in children can be influenced by two factors, namely internal factors including gender, premature birth, hearing loss, and speech abnormalities [5]. While external factors include parenting, parental work, parental education, family history, number of languages, and exposure to gadgets [6]. The impact of children who experience speech delays is difficulty communicating effectively and difficulty interacting with others [7]. Speech delays have the potential to affect children's intellectual and psychological development, risk of experiencing stress and social pressure, such as bullying or poor treatment from the surrounding environment [8]. To prevent these impacts, efforts are needed to help overcome speech delays in children. Speech therapy is one of the solutions to overcome speech delays, but the high cost of therapy is an obstacle for some families [9]. The lack of information and education for parents about how to stimulate speech at home without having to go to a therapist also exacerbates this condition [10]. This encourages the need for innovation in helping speech stimulation, one of which is the use of audio-visual media.

Previous research has shown that audio-visual media is effective in improving children's speech skills, as they involve the senses of hearing and sight [11]. Previous research made audio-visual media with results showing an improvement in speech skills in children, the media has not focused on word production exercises, and sentence structure and there is no guidance for parents to help stimulate speech in children. The use of audio-visual media can help in the speech therapy process without always having

to come to a therapist. Although previous studies have proven the effectiveness of audio-visual media to help stimulate children's speech, there has been no research that has made interactive audio-visual media based on co-viewing prototypes as an effort to prevent speech delays in preschool-age children.

The co-viewing method is a method that involves a parent or caregiver as a companion when the child watches content [11]. This method has been proven to increase children's understanding of media content, strengthen the relationship between parents and children, and can protect children from age-inappropriate content [12]. Previous research has shown that co-viewing combined with content adjustment strategies is effective in lowering the risk of exposure to age-appropriate content. With this method, parents can guide, explain, and deepen the meaning of the content and message of interactive audio-visual media [13]. Based on these conditions, the researcher created an interactive audio-visual media based on a co-viewing prototype which aims to prevent speech delays in children. Interactive media with features include two-way interaction (stimulus and response), use with parents, stages of speech stimulation, and duration and frequency of use of interactive audio-visual media. With this interactive audio-visual media, it is hoped that it will find out how to use interactive audio-visual media as an effort to prevent speech delays in children.

Research Objectives

The study aims to determine effectiveness of using interactive audio-visual media for speech stimulation in preschool-age children, speech development responses with doubtful or unclear developmental categories, and the role of parents or caregivers in accompanying children during media use as an effort to prevent speech delays.

Methods

This type of research is qualitative and the research design used is a case study. A qualitative approach was used to determine the use of interactive audio-visual media as an effort to prevent speech delay in preschool-age children. The design of this study aims to describe the use of interactive audio-visual media, preschool speech development responses, and the role of parents or caregivers in accompanying children using interactive audio-visual media.

The subjects of this study are preschool children of 3-6 years old who are registered at the early childhood education programs Laboratory University of Malang in Blitar City with dubious development categories according to Developmental Pre-Screening Questionnaire. The Ministry of Health of the Republic of Indonesia has developed a questionnaire to detect the developmental level of children aged 0 to 72 months (6 years) at an early stage, known as KPSP. The main subjects of observation were 7 children, as well as supporting informants, namely parents or caregivers and teachers. Data collection was carried out in March-April 2026 at the Early Childhood Education Laboratory of University of Malang in Blitar City through observation methods, in-depth interviews, and documentation studies. The main instrument in qualitative research is the researcher himself, directly interacting and collecting data from participants, supporting instruments namely the KPSP and research materials in the form of interactive audio-visual media prototypes. Data analysis is carried out through the stages of data reduction, data presentation, and conclusion drawn. The validity of the data is maintained through credibility, transferability, dependability, and confirmability while still applying research ethics.

Results

The University of Malang in Blitar City Early Childhood Education (PAUD) Laboratory is a private educational institution under the auspices of the State University of Malang (Universitas Negeri Malang), operating as part of the Laboratory School Management Unit. This institution provides early childhood education services through two programs: a playgroup and a kindergarten. Its educational activities utilize a child-development-oriented curriculum that employs thematic and play-based approaches.

The subjects of this study were 7 children as 5 boys and 2 girl and aged between 42 until 62 months (preschool age) who were physically healthy but fell into the "questionable" developmental category based on KPSP screening results. Supporting informants consisted of seven parents or caregivers within the productive age range of 23 to 45 years. Their educational backgrounds ranged from high school or vocational school to Diploma and Bachelor's degrees, while their employment statuses included homemakers, private-sector employees or freelancers, and childcare providers.

Table 1. Characteristics of Subjects and Informants

Subject Initials	Age (Month)	Sex	Parents	Age (Year)	L/P	Parents' Education	Last Teacher	Parenting Work
An. A	42	Male	Mrs. D	31	Female	S-1 Mathematics		Freelance
An. B	45	Male	Mrs. B	28	Female	Diploma Three		Housewives
An. C	51	Female	Mrs. U	31	Female	S-1 Education	Teacher	Private Employees
An. D	53	Male	Mrs. S	23	Female	High School		Caregiver
An. E	53	Male	Mrs. L	41	Female	High School		Housewives
An. F	59	Male	Mr. H	45	Male	High School		Private Employees
An. G	62	Female	Mrs. M	33	Female	High School		Housewives

Results of Speech and Language Development Analysis

The results of the development screening showed an increase in the overall KPSP score as well as in the speech and language aspects after being stimulated using interactive audio-visual media based on co-viewing for one week. Before the intervention (pre-test), the total score of KPSP was in the range of 6-7 (dubious category) and the score in the speech and language aspects was in the range of 2-3. After the intervention (post-test), the total score of KPSP increased to 8-9 and the score on speech and language aspects increased to 3-4, which showed an increase in vocabulary, verbal response, and courage in communicating.

Table 2. Results of Child Speech Development Screening

Subject Initials	Age (Month)	KPSP Pre-Test	Total Pre-Test	KPSP Post-Test	Total Post-Test	Pre-Test Speech & Language	Post-Test Speech & Language Test
An. A	42	7		8		2	3
An. B	45	7		9		2	2
An. C	51	7		9		2	4
An. D	53	7		8		3	4
An. E	53	7		8		3	3
An. F	59	6		9		2	4
An. G	62	7		9		3	3

The difference in the improvement of speech ability in the characteristics of the participants also affects speech development. Children who are responsive to media show faster improvement, while passive children take longer to show development.

Use of Co-Viewing Based on Interactive Audio-Visual Media

The use of interactive audio-visual media with the co-viewing method has a positive impact on children's speech development. Interactive media based on multisensory stimulation is effective in attracting attention and improving children's focus. Parental or caregiver assistance while watching provides two-way interaction through questions and answers, explanations of video content, and reinforcement of new vocabulary. The findings of observation and interviews show five themes, namely the development of children's speech skills, the role of interactive audio-visual media, the role of parents, environmental factors and social behavior.



Figure 1. Prototype Interactive Audio Visual Media

Children's Speech Skills Development

The development of children's speech skills after being stimulation with interactive audio-visual media showed a change in speech development in the study subjects. Children begin to show interest in the media, are more active in responding to questions, and are able to say simple vocabulary. Shown in the quote: *"On the second day, An. B shows an increase in communication engagement, the child looks more comfortable and starts actively responding to questions. An. B is able to say the words as they are in the interactive audio-visual media, but articulation errors are still found."* (P2)

The Role of Interactive Audio-Visual Media

Interactive audio-visual media is able to attract children's attention during the stimulation process, able to increase the child's focus, interest, and participation even though there are still articulation errors. This shows that the media not only attracts the child's attention, but also helps the child maintain concentration during activities. Shown in the quote: *"Responses when using interactive audio-visual media, he follows can be colors, can be letters, his child's response is active by jumping and jumping. He was interested in the audio-visual media provided."* (P1)

The Role of Parents

The involvement of parents or caregivers has an important role in supporting the development of children's speech skills during the use of interactive audio-visual media. Assistance that is actively carried out helps children understand the content of media, increase attention, and train communication skills through two-way interaction. Show in the quote: *"I accompanied him next to him, and if he invited me to talk, I would explain, if not, I would let him."* (P2)

Environmental Factors and Social Behavior

The environment around children has a great influence on the development of speech skills of preschool-age children. A supportive environment can help improve a child's communication skills, while an environment that lacks stimulation can lead to speech development barriers. Show in the quote: *"I accompany children to watch as well as explain the content of videos, ask questions, interact with children when using active media."* (P4)

The use of interactive audio-visual media helps increase children's confidence in communication. Improving speech skills has an impact on children's courage in social interaction. Show in the quote: *"On the third day of stimulation, An. F showed quite good development compared to the previous day, looked more confident, more active in participating in activities."* (P6)

Discussion

Interactive audio-visual media is effective in helping to improve children's speech skills, by combining auditory elements, namely sound and word pronunciation, as well as visual, namely images and animations [15]. Interactive audio-visual media serves as a language model that children can imitate

by learning language through imitation, introducing clear and repetitive language [16]. In the use of interactive audio-visual media, children imitate words heard from the media, such as animal names, fruits, means of transportation and colors. Gradual exposure to media and word repetition can improve pronunciation and enhance the clarity of articulation. While the pronunciation of the letters "R" and "L" may remain imperfect a normal occurrence at this early stage these errors could persist if appropriate stimulation is not provided.

Interactive audio-visual media serves as the main stimulus that can improve children's speech skills. Early stimulation of speech development using interactive audio-visual media can prevent delays by increasing media exposure in an interactive and educational manner, especially in the vocabulary aspect [17]. The stimulation provided can support the development of the child's social and emotional aspects, including increasing confidence in communicating and interacting with others [18]. The use of interactive audio-visual media shows changes in children's communication behavior. This condition can be seen in the change in children's communication behavior from initially only silent, passive, and unresponsive to starting to show interest in talking and responding to the questions given. Development is also seen in the aspect of children's self-confidence who at first is only shy and reluctant to speak begins to show the courage to respond, communicate, and interact with others during the stimulation process.

Development of Speech Skills Before and After Using Interactive Audio-Visual Media

The development of speech skills in preschool-age children is influenced by the quality of stimulation provided during the period of growth and development [16]. Improvements in vocabulary, language comprehension, and verbal communication skills in children can be increased by being given consistent speech stimuli through two-way communication, repetition of word pronunciation, and active interaction with parents or caregivers and the surrounding environment [19]. Conversely, children who do not get enough verbal stimuli may have difficulty in pronouncing vocabulary, sentence structure, and pronouncing clear sentences [20]. In addition to lack of stimulation, excessive use of gadgets can hinder the development of speech skills by limiting children's opportunities to interact face to face differences in speech skills before and after the administration of interactive audio-visual media help children understand, remember, and imitate vocabulary visually and auditory. However, parental involvement in providing directions, limiting excessive use of gadgets, and routinely encouraging two-way communication, affects the effectiveness of interactive audio-visual media.

Conclusions and Recommendations

Use of prototype based interactive audio-visual media co-viewing effective used as an effort to prevent speech delay in preschool-age children. The use of interactive audio-visual media shows that children speech skills have increased, character by increased vocabulary, improved articulation, and increased communication responsiveness. This increase occurs because the media provides multisensory stimulation through a combination of visual and auditory that makes it easier for children to understand and imitate language, and is supported by a repetition process that strengthens children's language memory. Presence and active involvement of parents or caregivers through the co-viewing play an important role in optimizing the understanding of instruction and deepening the meaning of educational shows for children. Based on these findings, it is recommended for parents and educators to implement interactive audio-visual media in a targeted manner through screen duration restrictions (*screen time*) which is accompanied by two-way interaction in a structured manner, and for future researchers It is necessary to develop research with a larger number of participants, the duration of the intervention needs to be extended to look at the development of children's speech in more depth. Need to develop media using ADDIE model (Analysis, Design, Development, Implementation, Evaluation).

Ethical Consideration and Competing Interest

In terms of research ethics, this study adhered to fundamental ethical principles, including informed consent, confidentiality, and voluntary participation. All participants were informed about the purpose and procedures of the study prior to data collection, and their consent was obtained before conducting interviews. The anonymity of participants was maintained by ensuring that personal identities were not disclosed in the reporting of findings. Furthermore, all data collected were used solely for research purposes, ensuring respect for participants' right and maintaining the integrity of the research

process. There is no conflict of interest related to this publication. The authors confirm that there are no conflicts of interest related to this study.

Acknowledgment

This research was supported by the Diploma III Nursing Study Program at the Health Polytechnic of the Ministry of Health (Poltekkes Kemenkes) Malang, Blitar Campus. We extend our gratitude to the educational institution in Blitar City for granting the researcher the opportunity to conduct this study.

Conflicts of Interest

The authors declare no conflict of interest related to this study.

References

- [1] D. C. da Silva Junior, Y. M. Castro, R. P. Dutra, D. P. Caumo, and M. P. da Silva, "Impact of the Use of Interactive Screens on Language Development in Children up to 6 Years of Age: A Systematic Review," *Child Care Health Dev.*, vol. 51, no. 6, p. e70176, Nov. 2025, doi: <https://doi.org/10.1111/cch.70176>
- [2] L. Rodgers, N. Botting, S. Harding, M. Cartwright, M. Amer-El-khedoud, and R. Herman, "Shared characteristics of intervention techniques for oral vocabulary and speech comprehensibility in preschool children with co-occurring features of developmental language disorder and speech sound disorder: a systematic review with narrative synthesis," *BMJ Open*, vol. 14, no. 8, pp. 1–16, Aug. 2024, <https://doi.org/10.1136/bmjopen-2023-081571>
- [3] S. A. Ali *et al.*, "Sociodemographic, health, and environmental determinants of speech delay in children: A case-control study," *Medicine*, vol. 104, no. 34, p. e43817, Aug. 2025, <https://doi.org/10.1097/MD.00000000000043817>
- [4] R. Agustina and N. Azizah, "Enhancing Language Development through Multisensory Media Interventions: A Classroom Action Research Study with Children Experiencing Speech Delays," *Journal of Innovation and Research in Primary Education*, vol. 4, no. 4, pp. 2536–2546, Sep. 2025, <https://doi.org/10.56916/jirpe.v4i4.2363>
- [5] E. De Stefani and D. De Marco, "Language, gesture, and emotional communication: An embodied view of social interaction," *Front. Psychol.*, vol. 10, no. SEP, Sep. 2019, doi: <https://doi.org/10.3389/fpsyg.2019.02063>
- [6] L. Wangke, W. Victory, N. H. Rampengan, and H. Lestari, "External risk factors associated with language disorders in children," *Paediatrica Indonesiana Original Article Paediatr Indones*, vol. 61, no. 3, pp. 133–173, 2021, <https://doi.org/10.14238/pi61.3.2021.133-40>
- [7] W. H. K. Liang, L. W. E. Gn, Y. C. D. Tan, and G. H. Tan, "Speech and language delay in children: a practical framework for primary care physicians," *Singapore Med. J.*, vol. 64, no. 12, p. 745, Dec. 2023, <https://doi.org/10.4103/singaporemedj.SMJ-2022-051>
- [8] J. M. Abugharsa, "Speech Delay in Children: Causes, Impacts, and Interventions: Speech Delay in Children," *Journal of Research in Education*, vol. 28, no. 2, pp. 106–113, Jul. 2024, <https://doi.org/10.65540/jar.v28i2.723>
- [9] V. C. Fong, B. S. Lee, and G. Iarocci, "A community-engaged approach to examining barriers and facilitators to accessing autism services in Korean immigrant families," *Autism*, vol. 26, no. 2, pp. 525–537, Feb. 2022, <https://doi.org/10.1177/13623613211034067>
- [10] K. Pritchard, V. Stojanovik, J. Titterton, and E. Pagnamenta, "How speech and language therapists and parents work together in the therapeutic process for children with speech sound disorder: A scoping review," *Int. J. Lang. Commun. Disord.*, vol. 60, no. 1, p. e13132, Jan. 2025, <https://doi.org/10.1111/1460-6984.13132>
- [11] I. Primastuty and T. Asmawulan, "The Use of Audio-Visual Media to Improve Early Childhood Language Development," *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, pp. 884–890, Jan. 2023, <https://doi.org/10.23917/iseth.4045>
- [12] O. Issn, S. Zahra, K. Azam, and A. Latif, "The Impact Of Parental Mediation On Children Digital Content Exposure," *Policy Journal of Social Science Review*, vol. 3, no. 12, pp. 522–536, Dec. 2025, Accessed: Aug. 27, 2026. [Online]. Available: <https://www.policyjssr.com/index.php/PJSSR/article/view/688>
- [13] O. Yelizarova *et al.*, "Digital Exposure in Early Childhood: Health Risks and Protective Strategies

- During Remote Learning,” *Inquiry (United States)*, vol. 62, Jan. 2025, <https://doi.org/10.1177/00469580251390766>
- [14] J. Ilmiah, P. Masyarakat, and B. Kesehatan, “Education and Socialization Of Pre Screening Developmental Questionnaire For Early Detection Of Child Development,” *Jurnal Ilmiah Pengabdian Masyarakat Bidang Kesehatan (Abdigermas)*, vol. 2, no. 1, pp. 1–6, Feb. 2024, <https://doi.org/10.58723/abdigermas.v2i1.146>
- [15] R. Febriyanita. M and N. Isna, “The Influence of Using Animated Videos to Improve Students Vocabulary and Pronunciation in English Language Learning,” *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, vol. 13, no. 2, pp. 3616–3630, Jul. 2025, doi: 10.24256/IDEAS.V13I2.7109.
- [16] R. Yuli, “The Use of Audio-Visual Methods to Improve Language Development of Children with Speech Delay Aged 5–6 Years: A Classroom Action Research in Early Childhood Education,” *Journal of Teaching and Education*, vol. 4, no. 2, 2025, doi: 10.31327/JTE.V4I2.2676.
- [17] Intisari, M. Y. Rahmat, H. S. Hasbur, and H. Fatimah, “The Effect of Audio-Visual Learning Media on Language Skills in Children Aged 4-5 Years,” *Al-Mudarris (Jurnal Ilmiah Pendidikan Islam)*, vol. 8, no. 2, pp. 395–408, Dec. 2025, <https://doi.org/10.23971/mdr.v8i2.10019>
- [18] N. Y. Nasution and A. Listiana, “Language and Social Development of Child Through Parental Stimulation: a Case Study,” *Esteem Journal of English Education Study Programme*, vol. 8, no. 1, pp. 357–361, 2024, <https://doi.org/10.31851/esteem.v8i1.17269>
- [19] N. B. Karatas *et al.*, “Improving second language vocabulary learning and retention by leveraging memory enhancement techniques: A multidomain pedagogical approach,” *Language Teaching Research*, vol. 29, no. 1, pp. 112–149, Jan. 2025, <https://doi.org/10.1177/13621688211053525>
- [20] H. Hendriadi, F. Fadillah, E. Ajriani, and A. A. Seha, “Speech Delay in Children Aged 4–5 Years as a Barrier to Early Childhood Language and Communication Development,” *Ahlussunnah: Journal of Islamic Education*, vol. 4, no. 3, pp. 810–821, Dec. 2025, <https://doi.org/10.58485/jie.v4i3.563>