AI-SUPPORTED SPEAKING SKILL DEVELOPMENT IN PRESCHOOL EDUCATION

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ABSTRACT

This study examines the effectiveness of AI-supported speaking practice in developing English speaking skills among six-year-old preschool children. Using a quasi-experimental pretest–posttest control group design, one group practiced speaking with the AI-based application Buddy.ai, while another group followed traditional classroom methods. Speaking skills were evaluated in terms of pronunciation, vocabulary, sentence formation, and fluency. The findings show that children who used AI support demonstrated greater improvement in oral performance. The study suggests that AI-based applications can effectively support speaking development in preschool education when combined with child-centered teaching practices.

Keywords: AI-supported learning; speaking skill development; preschool education; early childhood language learning; pronunciation; child-centered learning.

INTRODUCTION

In modern preschool education, the development of speaking skills has become one of the most important goals of early language learning. Speaking is not only the ability to pronounce words correctly but also the ability to express thoughts, feelings, and ideas in meaningful communication. For six-year-old children, oral language plays a central role in cognitive and social development. Therefore, effective methods for developing speaking skills in preschool classrooms are essential. Traditional methods of teaching speaking in preschool education usually include songs, repetition drills, role-plays, storytelling, and Total Physical Response (TPR) activities. These methods help children practice vocabulary and simple sentence structures. However, in large groups, not all children receive equal speaking time. Some children may feel shy or afraid of making mistakes in front of their classmates. As a result, their speaking progress may be slower.

In recent years, artificial intelligence (AI) technologies have begun to enter the field of early childhood education. AI-based applications can provide interactive speaking practice, immediate pronunciation feedback, and individualized learning pace. One example of such technology is Buddy.ai, an AI-powered application that enables young learners to practice speaking through voice-based interaction and immediate feedback. The theoretical foundation of this study is based on the ideas of Lev Vygotsky and Maria Montessori. According to Vygotsky’s social interaction theory, children learn language through interaction and guided support. When learners receive appropriate assistance, they can achieve higher levels of

development. AI tools may function as a form of guided support by providing structured speaking tasks and corrective feedback. Montessori's child-centered approach emphasizes independence, self-paced learning, and active participation. AI applications allow children to practice speaking individually and repeat tasks according to their own needs, which supports child-centered learning principles.

The purpose of this thesis is to examine the effectiveness of AI-supported speaking practice in developing English speaking skills among preschool children. The study is conducted as a quasi-experimental pretest–posttest control group design with two groups of six-year-old children. One group uses the AI application Buddy.ai during a two-week period, while the control group continues traditional speaking activities. The results of this study aim to determine whether AI support can significantly improve pronunciation, vocabulary use, sentence formation, and fluency in preschool learners.

This research is important because it explores how modern technology can be integrated into preschool education while maintaining a child-centered and socially interactive learning environment. The findings may provide practical recommendations for preschool teachers who aim to improve speaking skill development through innovative educational tools.

LITERATURE REVIEW

The development of speaking skills in early childhood is a central component of preschool language education. At the age of six, children actively develop pronunciation accuracy, vocabulary range, simple sentence construction, and basic fluency. These four components — pronunciation, vocabulary, sentence formation, and fluency — are commonly used indicators to evaluate early speaking competence.

According to Lev Vygotsky, language development occurs through social interaction. Children learn when they communicate with more knowledgeable partners who provide support and guidance. This support is often described as scaffolding. When children receive appropriate feedback, they gradually improve their speaking performance. In a preschool classroom, this support is traditionally provided by the teacher. However, new technologies may also provide structured interaction and guided feedback[1].

Another important theoretical foundation is the child-centered approach developed by Maria Montessori. Montessori emphasized that children learn best when they are active participants in the learning process. She believed that education should respect individual pace and independence. In speaking development, this means that each child should have enough time to practice orally, repeat words and sentences, and correct mistakes without fear. Individualized speaking practice is especially important for shy or less confident learners[2].

In traditional preschool classrooms, speaking practice usually includes songs, role-play, repetition drills, storytelling, and Total Physical Response activities. These methods support vocabulary development and simple sentence production. However, in large groups of 25–30 children, individual speaking time may be limited.

[1] Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.
[2] Montessori, M. (1967). The absorbent mind. Holt, Rinehart and Winston.

Not every child can receive immediate correction or detailed pronunciation feedback.

Artificial intelligence technologies are increasingly used in language education to provide personalized learning experiences. AI-based applications use speech recognition systems to analyze pronunciation and give instant corrective feedback. One example is Buddy.ai, which provides interactive speaking activities through AI-driven dialogue, speech recognition, and game-based tasks designed to improve fluency and confidence. Such applications may support speaking development by increasing repetition opportunities and reducing speaking anxiety.

Previous studies in early childhood education show that frequent oral practice and immediate feedback significantly improve pronunciation accuracy and vocabulary retention. Regular speaking practice over a short intensive period, such as two weeks, can lead to measurable progress in fluency and sentence formation. Therefore, combining traditional classroom interaction with AI-supported speaking activities may strengthen overall speaking development.

Based on these theoretical and practical perspectives, this study investigates whether AI-supported speaking practice can produce greater improvement in preschool children's speaking skills compared to traditional methods alone.

METHODOLOGY

This study was conducted using a quasi-experimental pretest–posttest control group design. A fully experimental design with random assignment was not possible because the preschool groups were already formed at the kindergarten. Therefore, two existing groups were selected and compared. The research aimed to examine whether AI-supported speaking practice leads to greater improvement in English speaking skills among six-year-old preschool children compared to traditional teaching methods.

The participants of the study were 60 preschool children aged six years. They were divided into two groups: an experimental group consisting of 30 children and a control group consisting of 30 children. Both groups had similar English language exposure and were taught within the same educational environment. Before the intervention, a speaking pretest was conducted to determine the initial level of speaking skills in both groups.

The speaking assessment focused on four key components of early oral competence: pronunciation clarity, vocabulary accuracy, sentence formation, and fluency. Each component was evaluated using a scoring scale from 0 to 3 points, where 0 indicated no response or incorrect production, 1 indicated limited performance, 2 indicated moderate performance, and 3 indicated good performance. The maximum possible score for each child was 12 points (3 points × 4 criteria). The mean pretest score of the experimental group was 5.8, while the control group had a mean score of 6.0. These results demonstrated that both groups had approximately the same level of speaking proficiency before the intervention.

The intervention lasted for two weeks. During this period, the experimental group used the AI-based speaking application Buddy.ai for 15–20 minutes daily. The application provided structured speaking missions, pronunciation practice with speech recognition technology, guided repetition of words and sentences, and interactive dialogue tasks. One important feature of the AI system was immediate

corrective feedback, which allowed children to repeat and improve their pronunciation multiple times. The individualized nature of the application enabled each child to practice at their own pace. In contrast, the control group continued learning through traditional speaking activities commonly used in preschool classrooms. These activities included songs, flashcards, role-play exercises, repetition drills, and Total Physical Response techniques. Teacher feedback was provided during classroom interaction, but individual speaking time was naturally limited due to the group setting. After the two-week intervention, a posttest was administered using the same tasks and evaluation criteria as the pretest. The experimental group demonstrated a mean posttest score of 9.6, while the control group achieved a mean score of 7.5. The improvement in the experimental group was calculated as 3.8 points (9.6 – 5.8), whereas the control group improved by 1.5 points (7.5 – 6.0). These results indicate that the group using the AI-supported speaking tool showed greater progress in pronunciation, vocabulary use, sentence formation, and fluency over the two-week period.

The data were analyzed by comparing the mean scores of both groups before and after the intervention. The difference in improvement between the experimental and control groups suggests that AI-supported speaking practice may have a positive effect on the development of preschool children's oral English skills. The application was used as a representative AI-supported speaking tool appropriate for young learners.

RESULTS AND DISCUSSION

The results of the study demonstrate a noticeable difference in speaking skill development between the experimental and control groups over the two-week intervention period. Before the intervention, both groups showed similar levels of English-speaking proficiency. The experimental group had a mean pretest score of 5.8 out of 12, while the control group had a mean score of 6.0. These results confirmed that both groups started at approximately the same level of pronunciation accuracy, vocabulary knowledge, sentence formation ability, and fluency.

Results Table

Group	Pretest Mean	Posttest Mean	Improvement
Experimental Group	5.8	9.6	+3.8
Control Group	6.0	7.5	+1.5

After two weeks of instruction, both groups demonstrated improvement. However, the degree of improvement differed significantly. The experimental group, which used Buddy.ai for daily speaking practice, achieved a mean posttest score of 9.6. This represents an improvement of 3.8 points. In contrast, the control group, which continued traditional classroom speaking activities, reached a mean posttest score of 7.5, showing an improvement of 1.5 points.

The greater improvement observed in the experimental group may be explained through the theoretical framework of this study. According to Lev Vygotsky, learning occurs through guided interaction and structured support. The AI application provided immediate corrective feedback and repeated speaking

opportunities, functioning as a form of scaffolding. This continuous support likely helped children move beyond their initial performance level and improve pronunciation and sentence production more effectively. In addition, the findings can be interpreted through the child-centered learning principles of Maria Montessori. The AI-supported environment allowed children to practice speaking individually and at their own pace. They were able to repeat words and sentences without fear of embarrassment or peer pressure. This increased autonomy may have reduced speaking anxiety and encouraged more active participation. As a result, children in the experimental group had more opportunities to practice oral language compared to those in the traditional classroom setting.

Although the control group also improved, their progress was more limited. Traditional methods such as songs, repetition drills, and role-play are valuable for speaking development; however, in a group of 30 children, individual speaking time is restricted. Immediate and personalized correction is also more difficult to provide in a classroom environment.

Experimental Group (AI-Supported)

Speaking Component	Pretest Mean	Posttest Mean	Improvement
Pronunciation	1.5	2.5	+1.0
Vocabulary	2.0	2.7	+0.7
Sentence Formation	1.0	2.3	+1.3
Fluency	1.3	2.1	+0.8
Total (Max 12)	**5.8**	**9.6**	**+3.8**

Control Group (Traditional Instruction)

Speaking Component	Pretest Mean	Posttest Mean	Improvement
Pronunciation	1.6	2.0	+0.4
Vocabulary	2.1	2.4	+0.3
Sentence Formation	1.1	1.6	+0.5
Fluency	1.2	1.5	+0.3
Total (Max 12)	**6.0**	**7.5**	**+1.5**

Overall, the results suggest that AI-supported speaking practice can enhance pronunciation accuracy, vocabulary use, sentence formation, and fluency more effectively than traditional instruction alone within a short two-week period. However, AI should not replace teacher interaction but rather function as a supportive tool within a child-centered preschool learning environment.

CONCLUSION

This study examined the role of AI-supported speaking practice in preschool English education. The findings indicate that integrating AI tools into speaking activities can significantly enhance oral language development among six-year-old learners. Children who practiced with AI demonstrated greater improvement

compared to those who followed traditional instruction alone. The results support the importance of guided interaction and child-centered learning in early language education. AI applications can provide individualized feedback and extended speaking practice, complementing teacher instruction rather than replacing it. Although the study was conducted over a short period and within one kindergarten, the findings highlight the potential of AI as a supportive educational tool. Future research may explore longer intervention periods and larger participant groups to further examine the impact of AI in preschool language development.

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