

# The Effectiveness of Digital Game-Based Pedagogy in Language Abilities Among Children With Delay

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## ABSTRACT

Language delay impacts children's social development. Game-based teaching has shown promise in enhancing language skills, however, the effectiveness of digital game-based teaching for children with language delay remains underexplored. This study, focusing on Chinese kindergarten students, investigated the impact of digital game-based teaching pedagogy on the language development of children with delay. Employing a mixed-method approach, quantitative data from teachers' assessment scale, while qualitative data from semi-structured interviews. A randomized controlled trial was conducted among 60 students. Results revealed a significant improvement in the experimental group post-intervention compared to the control group. Interview findings showed positive attitudes from teachers and parents towards digital game-based teaching, alongside concerns such as distracted academic attention, excessive reliance on games, and prolonged screen radiation. These findings indicate benefits for improving language abilities of children with delay, while calling for attention to potential threats.

## KEYWORDS

Digital Game-Based Teaching, Educational Games, Early Childhood Interventions, Language Delay, Instructional Design, Kindergarten Students, Special Education, Developing Country

## INTRODUCTION

Globally, language delay is a pervasive issue that significantly affects children's social, emotional, and academic development (Aram & Nation, 2016). Traditional approaches to addressing language delays, such as direct instruction and therapeutic interventions, have been widely adopted in both Western and Eastern contexts (Conti-Ramsden & Durkin, 2012; Kim & Kim, 2017). However, these methods often lack the engagement and motivational elements essential for sustained learning, particularly for younger children (Fisher & Frey, 2012). Game-based teaching offers a promising solution by leveraging children's natural interest in games to create engaging and interactive learning environments. This approach has been shown to enhance various aspects of language development, including vocabulary, grammar, and syntax, by promoting active learning and cognitive development (Hwang & Wu, 2012; Papastergiou, 2009). Grounded in Vygotsky's (1978) theories on the educational

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potential of play, game-based teaching incorporates social interactions and cognitive development through interactive mediums. While Vygotsky's work did not explicitly address digital platforms, it laid the theoretical foundation for understanding the benefits of game-based learning. Prensky (2001) later expanded on it by emphasizing the motivational advantages of integrating games into educational environments. Despite these theoretical advancements, the growing reliance on digital and remote learning environments highlights the need for innovative strategies that can be effectively implemented in distance environments beyond face-to-face settings.

Digital game-based learning denotes the process of acquiring knowledge or completing objectives when facilitated by electronic devices such as computers or mobile phones. It emphasizes games, fun, competition, and problem solving (Sandberg et al., 2014). Previous studies have demonstrated the effectiveness of digital game-based learning in English (Yang & Chen, 2020), mathematics (Deng et al., 2020), and science, technology, engineering, art, and mathematics, often referred to as "STEAM" (Chen & Huang, 2023). It can improve students' learning motivation (Su, 2016) and academic performance (Lin et al., 2018). However, most of the studies were conducted in face-to-face classrooms as a trial without focusing on distance education environments. Moreover, there is a lack of research on students with special needs.

Whether in developed or developing countries, rapid technological advancements have driven the integration of digital tools in education, and addressing language delays through innovative approaches is a pressing concern. As a developing country, China has recognized the importance of innovative means in promoting educational equity, but current interventions remain traditional and classroom-based, with limited exploration of digital tools for remote or hybrid learning environments (Craft, 2016; Wu et al., 2014). This gap is especially significant given that access to face-to-face interventions may not always be feasible, underscoring the need for scalable, technology-driven solutions that can be implemented in distance education contexts.

This study aims to address the above gaps by investigating the effectiveness of digital game-based teaching on the language proficiency of kindergarten students with language delays. Existing research often employs either a strictly qualitative or quantitative method without integrating both to capture the multifaceted impact of digital game-based teaching in remote learning contexts. This study uses a mixed research method to obtain students' scores through different pedagogies and feedback from teachers and parents, emphasizing the potential and effectiveness of digital game-based pedagogy in distance education environments. The findings inform future educational practices and policies, particularly in the context of remote and hybrid learning environments.

The research questions are as follows:

- Is digital game-based pedagogy effective in improving the language ability of children with language delays?
- Is there a significant difference in language proficiency among children with language delays who receive digital game-based instruction compared to those who receive traditional instruction?
- What are the views of parents and teachers of children with language delays on digital game-based pedagogy, particularly in the context of distance education?

## LITERATURE REVIEW

Conti-Ramsden and Durkin (2012) highlighted that language delay is associated with various negative outcomes, such as academic difficulties, social withdrawal, and lower self-esteem, emphasizing the urgency of effective interventions. Fisher and Frey (2012) analyzed traditional teaching methods, such as repetitive drills and direct instruction, which are commonly used to address language delays. While these methods can be effective in structured learning environments, they often lack engagement for young children, limiting their long-term impact. These studies underscore the

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