

ANALYSIS OF THE USE OF DIGITAL EDUCATIONAL GAMES IN DEVELOPING THE LANGUAGE OF CHILDREN AGED 4–5 YEARS

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Abstract

The development of digital technology has significantly influenced early childhood education, including the use of digital educational games as a medium for language development. This study aims to analyze the use of digital educational games in developing the language skills of children aged 4–5 years, covering aspects of expressive and receptive language. This research employs a literature review (studi literatur) method by collecting, reviewing, and synthesizing relevant scientific articles published between 2016 and 2024. Data sources were obtained from national and international journals, including Jurnal Obsesi, Murhum, KIDDO, and PAUD Agapedia. The results show that digital educational games have a significant positive effect on children's language development, especially in improving vocabulary, listening skills, and verbal expression. Interactive elements such as animation, audio narration, and responsive feedback were identified as key factors in stimulating language acquisition. This review also found that the effectiveness of digital games depends on the appropriateness of content with the child's developmental stage and the role of educators in guiding the learning process. The findings of this study confirm that digital educational games are a relevant and effective innovative media for language development in early childhood.

Keywords: *digital educational game, language development, early childhood*

Abstrak

Perkembangan teknologi digital telah memberikan pengaruh signifikan terhadap dunia pendidikan anak usia dini, termasuk penggunaan game edukasi digital sebagai media pengembangan bahasa. Penelitian ini bertujuan untuk menganalisis penggunaan game edukasi digital dalam mengembangkan kemampuan bahasa anak usia 4–5 tahun, khususnya pada aspek bahasa ekspresif dan reseptif. Penelitian ini menggunakan metode studi literatur dengan mengumpulkan, menelaah, dan mensintesis artikel-artikel ilmiah yang relevan yang diterbitkan antara tahun 2016 hingga 2024. Sumber data diperoleh dari jurnal-jurnal nasional dan internasional, di antaranya Jurnal Obsesi, Murhum, KIDDO, dan PAUD Agapedia. Hasil kajian menunjukkan bahwa game edukasi digital memiliki pengaruh positif yang signifikan terhadap perkembangan bahasa anak, terutama dalam meningkatkan kosakata, kemampuan menyimak, dan ekspresi verbal. Elemen interaktif seperti animasi, narasi audio, dan umpan balik responsif teridentifikasi sebagai faktor kunci dalam menstimulasi pemerolehan bahasa anak. Kajian ini juga menemukan bahwa efektivitas game digital bergantung pada kesesuaian konten dengan tahap perkembangan anak serta peran pendidik dalam mendampingi proses pembelajaran. Temuan penelitian ini mengonfirmasi bahwa game edukasi digital merupakan media inovatif yang relevan dan efektif untuk pengembangan bahasa pada anak usia dini.

Keywords: *game edukasi digital, perkembangan bahasa, anak usia dini, usia 4–5 tahun*

INTRODUCTION

Early childhood is an individual who is in the age range of 0–8 years and is experiencing a very rapid period of development in all aspects of his life. This period is often referred to as the golden age because it is during this period that the growth and development of children take place optimally. Various aspects of development, such as physical-motor, cognitive, social-emotional, moral, religious, artistic, and language development develop in an integrated manner and influence each other. Therefore, proper stimulation in early childhood is an important factor in supporting the achievement of optimal development. One of the aspects of development that has a central role in children's lives is language development because language is the main means for children to interact, communicate, and understand the environment around them (Judijanto, Minarsih, Saepulloh, & Muthie, 2025).

Language development in early childhood includes the ability to understand language (receptive language) and the ability to use language to communicate (expressive language). Receptive language is related to the ability of children to listen, understand instructions, and grasp the meaning of the messages received, while expressive language is related to the ability of children to convey ideas, thoughts, feelings, and needs through words and sentences. At the age of 4–5 years, children are generally able to use simple to complex sentences, tell about experiences, answer simple questions, recognize various new vocabulary, and follow instructions given by adults (Meylinda, Hasni, & Haryanto, 2026). Well-developed language skills will support children's success in the learning process and facilitate social interaction with peers and adults.

In the context of early childhood education, various learning strategies and media are used to stimulate children's language development. One approach that is considered effective is play-based learning because play is the activity that is closest to the child's world. Through play activities, children can actively learn, explore the environment, and develop various abilities naturally and fun. Along with the times, the

form of games used as learning media has also changed, including the presence of various digital technology-based games that can be used as educational means.

In the era of the industrial revolution 4.0 and digital transformation that is growing rapidly, technology has become an integral part of people's daily lives, including children. The use of digital devices such as smartphones, tablets, and computers has become a common phenomenon found in family environments and educational institutions. This condition encourages educators to utilize technology as a learning medium that is in accordance with the characteristics of the current digital generation. Digital technology is no longer seen solely as a threat to children's development, but rather as an opportunity to create a more innovative, interactive, and engaging learning experience when used appropriately and in a targeted manner (Isrofah, Sitisaharia, & Hamida, 2022). One form of using technology in early childhood learning is digital educational games.

In the language development of children aged 4–5 years, digital educational games have the potential to provide diverse stimulation. Children can learn new vocabulary, understand the meaning of words, practice listening skills, develop speaking skills, and improve communication skills through various interactive activities available in the game. In addition, the use of interesting digital media can help maintain children's focus and attention during the learning process (Aminah, Sitanggang, & Faisal, 2025). Thus, digital educational games have the potential to be one of the effective learning media alternatives in supporting early childhood language development.

However, the use of digital educational games in early childhood education still raises various views among the public. Some parents and educators still think that the use of digital devices can have a negative impact on children's development if used excessively. On the other hand, a number of studies show that the use of digital technology that is designed in an educational manner, accompanied by adults, and adjusted to the needs of children's development can have a positive impact on the learning process. These differences of views show the need for a more in-depth study

on the effectiveness of the use of digital educational games, especially in supporting early childhood language development.

The urgency of this research is based on the fact that there are still many educators and parents who have not comprehensively understood the potential of digital educational games as a medium for children's language development. On the other hand, empirical research on the effectiveness of digital educational games on the language development of children aged 4-5 years in Indonesia still needs to be enriched through systematic studies. Dewi and Agung in their research stated that interactive multimedia-based games have been proven to be able to significantly improve the language aspect of early childhood compared to conventional methods (Dewi & Agung, 2021).

Based on this background, this study aims to: (1) analyze the concepts and characteristics of digital educational games that are relevant to the language development of children aged 4–5 years; (2) identify the influence of the use of digital educational games on children's expressive and receptive language aspects; and (3) reviewing the factors that affect the effectiveness of digital educational games in the context of early childhood language development.

METHODS

This study uses a literature study method (*literature review*) which is systematic and analytical. The literature study method was chosen because it allows researchers to collect, review, and synthesize various findings from previous studies comprehensively (Agus Cahyono, Sutomo, & Hartono, 2019). This approach is relevant to answer research questions that are conceptual and analytical based on the accumulation of knowledge that already exists in the scientific literature.

The data sources in this study are scientific articles published in reputable national and international journals in the range of 2016 to 2024. Literature search was carried out through electronic databases, including Google Scholar, SINTA (*Science and Technology Index*), and the journal portal Crossref. The keywords used in the search process include: "digital educational games", "early childhood language

development", "early childhood digital media", "language development early childhood", and "educational games preschool".

The article inclusion criteria used in this study are: (1) articles published between 2016–2024; (2) the research topic is related to digital educational games and/or language development of children aged 4–6 years; (3) the article has gone through a peer review process; and (4) available in *full text*. Exclusion criteria include articles that are not topically relevant, articles without a clear author identity, and articles that use samples outside the early childhood age range.

The data analysis process is carried out through several stages, namely: (1) identification and selection of literature; (2) data extraction in the form of findings, methods, and conclusions from each article; (3) organizing data into key themes; and (4) synthesis of findings to produce comprehensive conclusions. In this study, 14 articles were successfully collected that met the inclusion criteria and were used as the main source of analysis. The following is a diagram of the steps in carrying out a *systematic literature review*.

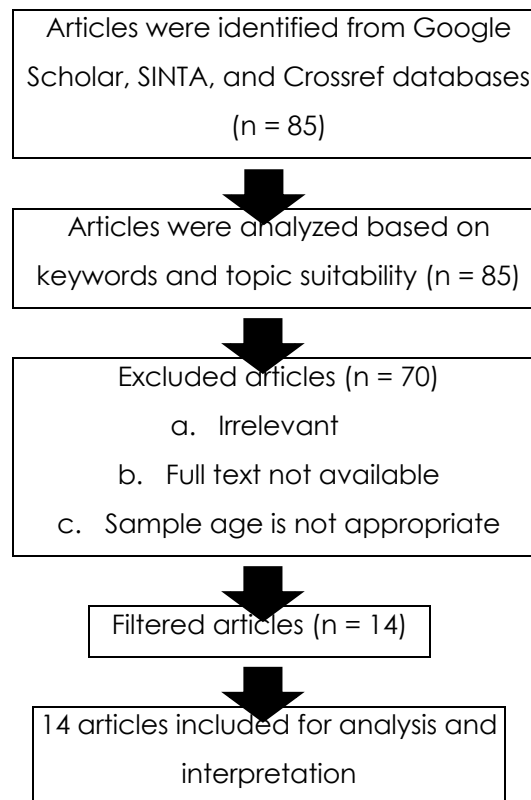


Figure 1. *Systematic literature review step flow chart*

RESULTS AND DISCUSSION

The articles found were analyzed to find the research themes described in table 1.

Table 1. Analysis of articles based on the formulation of research problems

Yes	Name of Journal/Author	Analysis of Research Findings	Research Theme
1	Setiawan, Praherdhiono, & Suthoni (2019)	Digital educational games are interactive learning media that integrate elements of play and education so as to increase children's involvement in learning.	Educational Game Concept
2	Stuart & Stuart (2024)	Digital games have the potential to develop various aspects of children's development through fun and interactive learning activities.	Educational Game Concept
3	Widuroyekti, Luluk, & Iswati (2023)	Audio-visual-based educational games are able to improve early childhood language literacy through multisensory stimulation.	Educational Game Concept
4	Goddess & Great (2021)	The use of digital educational games improves expressive language skills, especially vocabulary addition and simple sentence formation.	The Influence of Games on Language
5	Zusanty, Masitoh, & Setyowati (2022)	Puzzle education games have a positive effect on active vocabulary and fluency in speaking in kindergarten children.	The Influence of Games on Language
6	Satriana et al. (2022)	Digital learning media is able to improve the literacy skills and verbal abilities of children aged 5–6 years.	The Influence of Games on Language
7	Pancawati & Widayati (2024)	Educational games improve receptive language skills, especially understanding new instructions and vocabulary.	The Influence of Games on Language

8	Fuadah, Tiara, & Pratiwi (2022)	Interactive digital fairy tales significantly improve early childhood listening skills.	The Influence of Games on Language
9	Scarlet Witch (2022)	Expressive language develops through active communication activities that can be facilitated through interactive digital media.	The Influence of Games on Language
10	Ihmeideh (2022)	The effectiveness of games is greatly influenced by the suitability of the content with the child's developmental stage.	Game Effectiveness Factors
11	Azizah & Salehudin (2023)	Parental and teacher assistance is an important factor in optimizing the use of digital educational games.	Game Effectiveness Factors
12	Aprilia & Thaib (2024)	Excessive use of games has the potential to inhibit language development if it is not balanced with direct social interaction.	Game Effectiveness Factors
13	Bulut, Samur, & Cömert (2022)	Engaging and interactive game design increases engagement and language learning effectiveness.	Game Effectiveness Factors
14	Ministry of Education, Culture (2014)	Explain the indicators of early childhood receptive language development as the basis for research analysis.	The Influence of Games on Language

1. The Concept of Digital Educational Games in Early Childhood Learning

Digital educational games are interactive software designed with learning purposes in mind and packaged in a game format that appeals to users, especially children. (Setiawan, Praherdhiono, & Suthoni, 2019) defines digital educational games as a new form of learning experience that utilizes technological developments to deliver educational content in a fun and interactive way. The main characteristics of digital educational games include elements of high interactivity, direct feedback (*immediate feedback*), animation visualization, audio narration, and reward system (*reward*) which motivates children to continue learning.

The use of digital educational games in early childhood is in line with the principle of playing while learning (*learning through play*) which is the pedagogical foundation of early childhood education (PAUD). (Faizatunisa & Kuniati, 2024) In a systematic study, they concluded that digital games have great potential as an effective educational strategy to help early childhood develop various skills in an interactive and engaging manner. When games are designed appropriately for developmental age, not only the cognitive aspects develop, but also the language, social-emotional and creativity of the child.

Digital educational game media is able to improve language literacy in early childhood through the presentation of content that is audio-visual and responsive to children's interactions (Widuroyekti, Luluk, & Iswati, 2023). This is in line with the characteristics of early childhood learning which are concrete, contextual, and require multisensory stimulation to maximize the language acquisition process.

2. The Influence of Digital Educational Games on the Development of Expressive and Receptive Language

Expressive language refers to the ability of children to convey thoughts and feelings through words, both verbally and in writing. In children aged 4–5 years, expressive language is characterized by the ability to pronounce sentences of 4–6 words, name objects around them, and relate simple experiences (Na'imah, 2022). The results of the literature review show that digital educational games have a significant positive influence on children's expressive language development, including the ability to produce new words and build simple sentences (Dewi & Agung, 2021). The audio narrative elements in the game provide a rich language model to the child, so that the child is motivated to imitate and use new vocabulary in a meaningful context.

These findings are reinforced by the results of the study (Zusanty, Masitoh, & Setyowati, 2022) which shows that the puzzle education game media has a positive effect on the language development of kindergarten children, where children who use the media regularly show a significant improvement in terms of active vocabulary

and fluency in speaking. Further, (Satriana et al., 2022) emphasized that digital learning media is able to stimulate the literacy skills of children aged 5–6 years, including verbal expressive skills. Children's interactions with game characters who provide verbal instructions and ask for active responses from children have been shown to expand expressive language capacity naturally and not to be boring.

Receptive language is the ability of children to understand and interpret language received from the environment, either in the form of oral instructions, questions, or narratives. Based on Permendikbud No. 137 of 2014, the indicators of receptive language for children aged 4–5 years include the ability to understand two commands at once, recognize vocabulary related to daily activities, and listen to simple stories (Ministry of Education, Culture, 2014).

The results of a literature review show that digital educational games are able to improve children's listening skills and verbal comprehension. The group of children who received the educational game intervention consistently showed higher scores of receptive language skills than the control group (Pancawati & Widayati, 2024). The clear and repetitive presentation of audio in games helps children build an understanding of the meaning of words gradually.

In line with that, (Fuadah, Tiara, & Pratiwi, 2022) It was found that digital fairy tales which are a form of narrative games have a significant effect on the listening ability of children aged 5–6 years. Interactive audio-visual narration in digital content stimulates the language processing area in the child's brain more optimally than conventional lecture methods.

3. Factors Affecting the Effectiveness of Digital Educational Games

The effectiveness of digital educational games in developing children's language is not absolute, but is influenced by various factors. First, the suitability of the content with the child's developmental stage. Digital games for early childhood should be designed according to principles *developmentally appropriate practice* (DAP), which considers the characteristics of the child's age, ability, and interests. Games that are too easy or too difficult will not provide optimal stimulation for language development (Ihmeideh, 2022).

Second, the active role of educators and parents. The use of educational games on gadgets for early childhood must be accompanied by adult assistance so that its positive impact on children's development can be maximized (Azizah & Salehudin, 2023). Without guidance, children are at risk of using devices in an undirected manner that can actually hinder social interaction and natural language development.

Third, the duration and intensity of use. Excessive screen time has the potential to negatively impact early childhood language development, especially if it is not balanced with meaningful social interaction (Aprilia & Thaib, 2024). Therefore, the use of digital educational games needs to be integrated in a balanced manner with active play, storytelling, and direct communication between children and teachers and parents.

The fourth is the quality of game design, a good educational game design process can increase children's creativity and involvement in the learning process. Games equipped with attractive visual elements, quality audio, a coherent storyline, and a progressive challenge system have proven to be more effective in retaining children's attention and interest in learning than games with a simple design (Bulut, Samur, & Cömert, 2022).

CONCLUSION

Based on the results of the literature review that has been conducted, it can be concluded that the use of digital educational games has a significant positive influence on the language development of children aged 4-5 years, both in the aspects of expressive and receptive language. Digital educational games are able to stimulate children's active vocabulary, listening skills, and verbal expression through rich interactive elements, such as animations, audio narration, and live feedback. The effectiveness of digital educational games is influenced by the suitability of the content with the child's developmental stage, the quality of the game design, the duration of measurable use, and active assistance from educators and parents.

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