



Transforming Pedagogy with Digital Games: Tapak Nusantara as a Tool for Early Childhood Critical Thinking Development

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ABSTRACT

Objective: This study explores pedagogical transformation in early childhood education through digital game-based learning by developing Tapak Nusantara, a digital adaptation of the traditional crinkle game. Integrating pedagogical principles in game-based learning is crucial for fostering critical thinking in young learners. This research bridges cultural pedagogy with digital learning, ensuring children acquire meaningful educational experiences while preserving Indonesian culture. **Method:** This research is development research with a 4D model approach. The subjects of this study were 53 children in IT Nada Ashobah kindergarten class B and Labschool Unesa kindergarten class B. **Results:** This study showed a significant difference between the crinkle traditional and crinkle traditional games. The results of this study showed a significant difference between the pre-test and post-test scores in both the Nada Ashobah IT Kindergarten ($t = -8.494$, $p < 0.001$) and Labschool ($t = -5.783$, $p < 0.001$) groups, which indicated the effectiveness of the game in improving children's critical thinking. **Novelty:** This research lies in three key contributions: (1) the pedagogical innovation of integrating game-base learning with cultural education, (2) the digital transformation of a traditional game into a developmentally appropriate learning tool, and (3) Tapak Nusantara representative culture, pedagogy, and technology to cultivate critical thinking for early childhood.

INTRODUCTION

The rapid advancement of digital technology has undeniably transformed various aspects of education, especially in early childhood learning. Today, as children grow up in a technology environment, integrating digital tools into their education is no longer essential. The development of digital technology has resulted in children's learning at this age (Meng, 2023). Technology is used as a learning medium. Game-based learning is an educational innovation that stimulates children's cognition, including critical thinking (Hussein, 2019). For early childhood, critical thinking is needed; this ability is related to analyzing information, solving problems, and making decisions based on logic (Mohammed, 2023).

In early childhood, the development period requires appropriate stimulation and specific conditioning to suit learning objectives. As with critical thinking in early childhood, it cannot just appear but must come from learning experiences that children's curiosity (Afidah, 2024). However, the challenge in designing developmentally appropriate digital games that stimulate the critical thinking processes (Gurbuz & Celik, 2022; Mao et al., 2021; O'Reilly et al., 2022; Sen et al., 2021; Xiong et al., 2022). Providing stimulation in early childhood requires challenging and interactive activities so that children do not feel bored and are encouraged to find out. Game-based learning can be an effective medium for creating a fun learning

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