

Artificial Intelligence Through Games for Early Childhood

(Case Study: Kindergarten School)

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Abstract

This paper intends to see how the development of technology is increasing rapidly until it has penetrated into the world of education, where learning can now be done through games. In the past, games were only known as play tools, solely for entertainment and had no educational elements. But now, games are often used by young children as a learning method and this has been implemented in various schools, especially international schools. In this study, the focus that will be translated is how artificial intelligence through games can increase intelligence and stimulate children in terms of learning. By using qualitative methods with case study studies, it is hoped that this study can add insight to all of us as academics so that we are more open to thoughts and literate about technology which is currently very sophisticated.

Keywords: Artificial Intelligence, games, educations.



Introduction

Artificial intelligence is а technique used to imitate the intelligence possessed by living and inanimate objects to solve a problem (Fuzzy, 2017). As time goes by, technological developments are now increasing rapidly to penetrate into the world of education, where learning can now be done through games. In the past, games were only known as playing tools, solely for entertainment and had no educational elements. But nowadays, games are often used by young children as a learning method and this has been implemented in various schools. especially international schools.

Educational games are games created to stimulate the mind, including increasing concentration and solving problems. An effective interactive learning technique for early childhood is to use educational games. This is because most children at an early age have a high curiosity about everything in their Rahman & surroundings (R.A. Tresnawati, 2016). This educational game has a specific purpose, namely to educate. This educational game prioritizes to support the learning process with the concept of playing while learning.

For some children, the word learning will feel scary so it is hoped that with this interesting educational game, children will not realize that what they are doing is included in learning and children will be happy and willing to & learn (Siswanto Putra, 2013). Everything related education. to including systems, strategies, and processes in it is directed only to achieve quality and quality education (Sintya Maharani, 2015). Therefore, the focus that will be taken is how artificial intelligence through games can increase intelligence and stimulate children in terms of learning.

Methodology

The research methodology employed in this study is qualitative research, which is a procedure that generates descriptive data in the form of or written spoken words from individuals and observable behaviors. In line with this, Strauss and Corbin define it as a procedure to produce findings obtained from data collected through various means, including interviews, documents, books, or even precomputed data for other purposes. Meanwhile, Kenneth defines it as research aimed at providing a detailed description of a



phenomenon or depicting what is happening.

The data collection technique used in this study is a literature review. This technique was chosen because the research is based on media, aligning with the focus taken. A literature review is also conducted to find theoretical answers to the required information. With a literature review, information can be obtained not only through social media but also through books, journals, documentation, research reports, magazines, agendas, or mass media.

qualitative research, In data analysis can be carried out during the data collection process. One of the methods that can be used in analysis is data triangulation. The data triangulation process involves cross-checking information provided by one informant with other informants or mass media. Thus, the opinions obtained are not just the subjective opinions of one person. In broad terms, the data analysis process can be divided into three stages. First, summarizing and selecting key data, focusing on the needed information and discarding unnecessary data to avoid the analysis. expanding Second. organizing the existing data to facilitate an understanding of what is happening in the field. Third, the conclusion-drawing in which the process researcher understands meaning, patterns, explanations, and sequences. The conclusions drawn can be retested by examining the reality in the field. The expected end product of this research is a portrait of a group that incorporates the researcher's perspective as a participant.

Findings and Discussion

Artificial Intelligence

Technology (Artificial Intelligence) AI or artificial intelligence has experienced massive development from year to year. Its presence with new functions. features. and looks increasingly impacts many aspects of human life not least in education (Luger Stubblefield. 1993). Artificial and intelligence began to take a role in learning activities in schools and universities (Mulianingsih, et al. 2020). Artificial intelligence is a primary part in the and development of growth educational technology. This certainly has explicit implications for human work life in the future. The Role of Artificial Games Artificial Intelligence in intelligence (artificial intelligence) is the ability of computers or machines to imitate actions and decisions that would



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otherwise require human intelligence. In the context of games, artificial intelligence is used to create games that are more interesting, dynamic, and responsive to players. This allows the game to be more adaptive to the player's level of intelligence and skill (Sholikin, 2023).

Artificial intelligence, or AI, has ushered in a new phenomenon in the realms of corporate business and government. AI is generally associated with a tool for identifying and resolving complex issues in various business, corporate, and governmental domains. The core concept of artificial intelligence is to create a tool or machine capable of thinking like a human (Goralski & Tan, 2020). Artificial intelligence can complement human decision-making processes by reducing decisions based on personal beliefs (Bullock, 2019). In Bullock's study (2019), a comparison was made between humans and artificial intelligence in problem-solving. The results indicated that artificial intelligence excels in problems requiring high-level analytical skills with low and complexity, while uncertainty humans dominate in issues with higher uncertainty complexity and and relatively lower analytical capabilities. Nevertheless, according to Bullock (2019), through deeper learning (deep learning), artificial intelligence is expected to be able to tackle tasks and issues with higher levels of uncertainty (Solikhin, 2017).

The utilization artificial of intelligence in literature has seen extensive implementation, including its in application human resource management, such as information extraction from job candidate selection (Kaczmarek, Kowalkiewicz, & Piskorski, 2005); the selection of high-performance employees using data mining techniques (Chien & Chen, 2008); and employee development mapping using intelligent agent techniques (Giotopoulos, Alexakos, & Beligiannis, 2005). These studies primarily focused on the individual level and were confined to the private sector, with limited specific applications in the public sector management supervision. Consequently, this research is conducted to bridge this gap. The AI research in Indonesia began in 1987 when BPPT (Agency for the Assessment and Application of Technology) utilized it for multilingual machine translation а project sponsored by the Japanese government. This research paved the way for subsequent projects such as the



Universal Networking Language (UNL), ASEAN-MT, among others. In addition to research projects, there were commercial applications developed, one of which was a product called "Perisalah" designed to transcribe meeting conversations swiftly. The research was further extended towards speech-tospeech capabilities, integrating speech recognition technology, machine translation, and text-to-speech synthesis (Riza, Nugroho, & Gunarso, 2020).

Use of Digital Educational Games in Early Childhood Learning

Digital educational games are a form of learning and teaching facilitated by digital games, making the learning process closely intertwined with the use of games. Digital educational games offer two perspectives: one involves how individuals learn from these games, while the other pertains to how educators use games for teaching purposes (Putri, 2018). Digital educational games do not fundamentally differ from traditional games; they are often referred to as "teaching games," enabling students to interact and comprehend the world through an immersive environment (Edwards, 2013). These games enable the practice of factual knowledge and the development of virtual skills, thereby fostering reflexive memory and knowledge, as result of the а amalgamation of learning activities and gaming (Nikiforidou, 2018). Digital educational games can serve as an effective tool for teaching, as they build their own momentum and satisfaction, support various learning methods and capabilities, provide an interactive environment for problem-solving, and prioritize real actions (Fatmawati & Sholikin, 2019). Notably, this explanation is given by Kebritchi and Hirumi (2008).

In playing, children can define and assemble their activities, allowing them to gain experiences and enhance their skills (No et al., 2019). During the golden children rely learning age, on experiences that combine play and education, which involve acquiring various skills through games (Akman, B., & Güçhan Özgül, 2015). The use of digital educational games offers interactive learning insights, fosters interaction, and adapts to the evolving needs of children. In the early stages, children need stimulation to develop fine motor skills before moving on to cognitive domains. Participants can interact by, for example, touching screens, moving cursors, and learning skills such as understanding



simple rules or making choices. Using these games, children can enhance their imagination, increase their knowledge, create solutions, and enrich their culture, playing digital educational games in line with their developmental stage (No et al., 2019).

The application of digital educational games to children under 7 vears old involves different learning activities, with a focus on the affective and motivational aspects (Plowman, 2016). In general, educational games serve the purpose of building a learner's interest, fostering imaginative skills, developing computer skills, supporting diverse learning needs, and promoting social skills (Crompton, H., Lin, Y.-C., Burke, D., & Block, 2017). Therefore, the implementation of digital educational games should be seamlessly integrated with children's activities and not viewed as separate or additional activities (Johnson, J., & Christie, 2009). The aim of digital educational games is to provide insights, foster routine, and cultivate knowledge, all combined in a digital environment. There are four types of learning in digital educational games: basic content games like arithmetic, specific skills such as storytelling, systematic skills, and creative activities such as video creation (Klopfer, E., Osterweil, S., & Salen, 2009). Through play, children can choose and construct activities, making digital educational games a significant opportunity for development and skill-building in this era.

Benefits of Using Artificial Intelligence in Games

The benefits experienced and observed in young children since using game-based learning methods are as follows :

- Skill Development: a. Cognitive Games that artificial use intelligence can design challenges that match the player's level of understanding. It can aid in the development of cognitive skills such as problem-solving, critical thinking, and concept understanding.
- b. Personalized Learning: Artificial intelligence allows games to provide learning experiences tailored to each child's needs. This ensures that each child gets a challenge that matches his or her ability level (Sholikin, 2019).
- c. Motivation and Engagement: Games that use artificial



intelligence tend to be more engaging and motivating to players. Artificial intelligence systems can provide appropriate and positive feedback, keeping children's interest in the learning process

- d. More Fun Learning: Children tend to learn better when they enjoy the process. Games that use artificial intelligence can provide a fun more and engaging experience, which in turn stimulates their interest in learning.
- e. Active Learning: Games promote active learning, where children must be directly involved in the problem-solving, exploration, and decision-making processes.
- f. Development of Social Skills:
 Some games involve social interaction between children. It helps in the development of social skills such as communicating, collaborating, and resolving conflict (Sholikin et al., 2022).

Conclusion

In this discussion, it has been explained how the use of artificial intelligence through games can increase children's intelligence and stimulate them in terms of learning. This approach can be an interesting alternative in the world of children's education, because it can provide a more personalized, fun, and effective learning experience.

As well as showing the development in improving cognitive mastery in early childhood, one that is used to be able to develop children's cognitive abilities is the ICT method using digital educational game media. The rapid renewal of digital devices brings changes in delivering learning and can foster the perception of intelligence evaluation in the disciplines and contained in a digital learning unit. In the process of early childhood learning with the use of ICT methods through digital educational game media, it is very suitable to be used to improve early childhood cognitive abilities.

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