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The Role of Artificial Intelligence in Children's Education for A Digital Future

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Abstract.
Society 5.0 is a plan to generate a human-focused society that focuses on economic and social growth in Japan. The idea emerged as an evolution of Industrial Revolution 4.0, which is thought to have the capacity to revolutionize technology. One of the main features of Society 5.0 is the use of artificial intelligence. Artificial intelligence brings many benefits to various fields. One of them is in the field of education. Many studies claim that artificial intelligence can help ease human work and increase knowledge and skills in the field of education. Artificial intelligence has introduced fundamental challenges to education for students, educators and parents. But they are indirectly forced to use AI to learn. This is a solution, as well as a new problem that the education community must immediately adapt. Artificial intelligence has already become a part of education at high schools and colleges. However, at the kindergarten level, it is rarely used. On average, students at this level already have an AI-powered device at home. This study focuses on the role of artificial intelligence at the kindergarten level. This study recommends the importance of AI education at the kindergarten level to instill Artificial Intelligence skills in children from an early age, prepare them for the future of a digitalized world, and improve their computational and problem-solving abilities with artificial intelligence.

Keywords: Artificial intelligence, education, digital future, children, AI literacy

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1. Introduction

Society 5.0 is a human-focused technology-primarily based totally social idea that evolved via way of means in Japan. The idea emerged as an evolution of Industrial Revolution 4.0, which is thought to have the capacity to decorate the function of technology. One of the main features of Society 5.0 is the use of artificial intelligence. Artificial Intelligence (Artificial Intelligence) transforms the vast amount of data collected through the Internet (Internet of Things) in all fields into new wisdom to enhance human capabilities and open up new opportunities.

Artificial intelligence brings many benefits to various fields. One of them is in the field of education. many studies claim that artificial intelligence and some of its branches

can help ease human work and increase knowledge and skills in the field of education. Artificial intelligence is a method of human intelligence that is carried out through machines, especially computer systems. Artificial intelligence technology is now an unstoppable part of time travel. Technology has changed not only the way people live but also the way they work, study and socialize.

With improvements in computer and statistical process technology, AI is widely used in academic practice, along with intelligent guidance systems, coaching robots, adaptive learning systems, human learning systems, and interaction with PC. Implementation of artificial intelligence in training to assist adaptive learning processes (1).

AI has introduced fundamental challenges to education for students, educators, and parents. But they are indirectly forced to use AI to learn. This is a solution, as well as a new problem that the education community must immediately adapt to. The Importance of AI Development is Much Emphasized in Secondary and Higher Education (2). however, at the kindergarten level, this is rarely done. Younger generations have a robot or smartphone at home, so from an early age, they can interact easily with a computer. Either a handheld or a desk computer (3). This article refers to a literature review to further explore the role of education with Artificial Intelligence, both in the form of mobile and web-based learning media. This review consists of some basic questions. One of them is when is the right time to apply AI in education and what kind of artificial intelligence is suitable to be applied in education so that the learning process becomes more practical and effective.

2. Method

This study analyzes several studies on the role of education with artificial intelligence and its impact on children's education.

2.1. Research methods

To find and summarize relevant papers, a systematic procedure for selecting and categorizing literature was used as follows:

used in collecting articles are Scopus, Science Direct, and Web of Science. Keywords for the literature search are "Artificial Intelligence, AI, AIED, Education, Digital, Kindergarten".The review period is mainly 2019-2022. This study examines theories about artificial intelligence in children's education using PRISMA guidelines. The journal articles included in this review are those published during the previous 10 years of the

study. More than 1,000,000 search results were found using AI as a keyword, and 212,277 using the keyword artificial intelligence, 1,000,000 more using the keyword education, 525,711 articles were found with the keyword digital future. The results were then filtered again using inclusion and exclusion criteria and 8 articles were found to be very suitable for analysis, namely about the role of technology in children's education, especially the implementation of artificial intelligence.

2.2. Research question

Specific questions about systematic literature research on the implementation of education using artificial intelligence in children's education are :

1. What is the role of AI in education?
2. Why do we need AI education for young children and when is the right time to apply AI to education?
3. What should be learned in AI education for children? Is this the right educational approach?

3. Result and Discussion

This study aims to collect information on relevant research in education with artificial intelligence, especially children's education. The results of this study can be a reference for further research on the use of AI in education and/or solving problems related to it. There are 8 articles that discuss the advantages of artificial intelligence when applied in education. The classification of successful implementation of AI in detail is as follows:

3.1. The role of AI in education

A study conducted by Fan and Jiao in China concluded, "Artificial Intelligence in Education: Three Paradigms" argues that education with artificial intelligence falls into three guidelines, namely students as recipients, namely artificial intelligence is used to represent and direct cognitive learning while learners are recipients of artificial intelligence services, such as in the application of the intelligent tutoring system (ITS), then students as collaborators, namely artificial intelligence are used to support learning while students collaborate using artificial intelligence, for example, Dialogue Based Tutoring System (DTS), Exploration Learning Environment (ELE). and the last is

the learner as a leader, artificial intelligence is used to enhance learning, and students take charge of their learning with Human-Computer collaboration and Adaptive Learning.

3.2. The importance of the role of AI in children's education and the right time to implement it

A study titled Artificial Intelligence (AI) in Early Childhood Education by Jiahong and Zhong from China states: “Curriculum Design and Future Directions” describes an AI curriculum for kindergarten children, (1) statements of intent, purpose, goals, or results (2) subjects, domains, or content (3) methods or procedures and (4) evaluations and assessment. The study recommends achieving an AI Competency in three competencies AI knowledge, AI skills, and AI attitudes. The use of social robots as learning companions and programming has been proven to help children understand the principles of AI.

Another study conducted by Weipeng from one of the universities in China presented the results of his research on the integration of AI in early childhood education to integrate the knowledge of the ’why’, ’what’, and ’how’ of models relevant to artificial intelligence education for children. The teaching model proposed in their research provides a new basis for the education of children using artificial intelligence. Both formal (for example preschool) and informal (for example home, museum, and library learning environments). Preschoolers can equip themselves with the power of AI in real-life learning experiences to prepare them for an intelligent future. The study also describes how to train early childhood teachers to be able to add skills using AI that will have an impact on advanced STEM education. Ultimately, the implementation of AI education will equip children with AI literacy from an early age, and prepare them for the future of a digitalized world.

3.3. Proper AI lessons in children's education

Ismaila Temitayo Sanusi et al. (4) conducted a study in Finland and Hong Kong and found that children need to understand how artificial intelligence works when people face advances and distractions. caused by artificial intelligence. With the existence of technology that is used as a tool in the learning process, students get the information needed easily during learning. Currently, there is a trend that is developing both domestically and abroad, almost globally. Namely the application of artificial intelligence in learning k-12. These developments have necessitated the design and implementation of artificial

intelligence curricula and related resources in schools. The curriculum developed can be adopted in other contexts, but it should be pointed out that contextual and cultural values are taken into account. Moreover, the current curriculum and resources for fostering literacy in artificial intelligence education are concentrated in the east and west, indicating a clear gap in artificial intelligence education.

4. Conclusion

The conclusion shows that the application of education with artificial intelligence is a revolution in education and is very relevant. Through the application of AI education (5-8), children will acquire AI skills from an early age, prepare them for the future of a digitalized world, and promote sustainable development and social justice in PAUD and society. Artificial intelligence for children is very simple compared to students who are already in senior high school or college. so don't equate. There are many benefits for children to learning AI. For example, to improve children's numeracy and problem-solving skills, AI various ways such as Intelligent Tutoring Systems (ITS) which help students in learning and to determine students own abilities, students can also learn expressively and collaboratively by using a service called conversation-based tutoring systems (DTS) and others. In the learner-as-leader paradigm, AI is used to enhance learning, and students take charge of their learning. Technology plays a role in improving the quality of education and assisting in the learning process so that learning messages can be more easily accepted by children. but not all educators can use technology as a medium of learning. Therefore, there is a need for training and assistance from the relevant government so that educators can maximize the use of technology in the world of education.

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