The Enhancement of Children's Cognitive Abilities through Digital Game-Based Learning

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Abstract: The objective of this paper is to ascertain the advantages associated with the implementation of Digital Game Education in fostering the acquisition and enhancement of hard skills among youngsters. This study employs a literature review approach, which involves examining a range of scholarly journals that explore the use of Digital Game Education as a pedagogical tool. The research methodology involves identifying the subject matter of inquiry and specifically examining the advantages of incorporating Digital Games Education in fostering the acquisition of tangible skills among children. Subsequently, an extensive review of scholarly literature and empirical findings pertaining to this subject matter is conducted. Finally, conclusions are derived from the assimilation and comprehension of the diverse range of references consulted. The findings of this study indicate that the utilisation of educational learning media through Digital Games Education has the potential to enhance children's motivation to learn and foster the acquisition of cognitive skills, including proficiency in arithmetic, English, and Indonesian. This study has reached the conclusion that the advent of digitalization in the 5.0 age yields favourable outcomes for the advancement of education. One notable aspect pertains to the advancement of digital game education, which has the potential to enhance children's cognitive capacities, specifically in terms of their intellectual proficiencies (hard skills).

Keywords : *Digital Games Education, Hard Skills, Digitalization era*

INTRODUCTION

The onset of the COVID-19 pandemic occurred in 2019. The COVID-19 epidemic has had a significant impact on all aspects of society, including the education system. The introduction of remote learning (PJJ) has had a significant impact on the field of education. Distance learning, also known as PJJ (Pendidikan Jarak Jauh), is an educational approach that aims to equip educators, teachers, and students with the necessary skills to effectively utilise technology in the process of learning. The phenomenon of digitalization has emerged as a viable option in response to the dynamic

circumstances brought about by the COVID-19 pandemic. Digitalization serves as a conduit for the seamless transition of educational practises, ensuring the uninterrupted progression of learning and knowledge acquisition (Rahmi, 2020).

According to Padmawati (2022), Society 5.0 represents a novel phase characterised by the integration of human-centric principles and technology-driven aspects into social existence. In the context of Society 5.0 and the educational landscape within the COVID-19 epidemic, it is imperative to cultivate a heightened understanding of technology in order to facilitate the growth and development of students. The rapid pace of technological advancements necessitates the adaptation of the education sector to the process of digitalizing the evolving educational system. Society 5.0 is confronted with the task of ensuring that the digital realm yields advantageous outcomes, particularly with regard to the developmental progress of children. The challenges posed by Society 5.0 necessitate meticulous packaging and preparation to ensure their alignment with the contemporary educational curriculum. This curriculum comprises three key components: 1) character education; 2) critical, creative, and innovative thinking skills; and 3) proficiency in applying technology within the given era (Sukarno, 2020).

According to Rusman (2013), learning media is a message carrier technology that can be employed for learning purposes, and learning media is also a physical means of imparting subject matter. Digital games, which can be played on Android mobile devices as well as computers, laptops, and personal computers, are an example of a technology-based educational platform that is currently favoured by children.

There has been a discernible uptick in the number of people playing video games online. The role that games play in people's lives is becoming increasingly important over time. The ever-increasing number of people who play video games has directly contributed to the explosive growth of the video game industry. The global gaming industry is expected to generate income that is greater than 115 billion dollars in the year 2018, according to current forecasts that have been made (McDonald, 2017).

The utilisation of technological devices within society is a prevalent activity. The use of technological devices, particularly Android gadgets, is prevalent not just among adults but also among youngsters. Children have a strong affinity for games, making them a popular form of entertainment. A considerable number of parents permit

their children to use cellphones for a range of purposes, including ensuring that children do not disrupt their jobs and preventing negligence among youngsters, among other justifications (Sulistyowati, Gunawan, & Rusdiana, 2022). Children constitute a significant demographic of users of digital technology. This phenomenon is attributed to the notable capacity of children to readily adapt to technological advancements. According to Selwyn (2009), children possess the capability to engage in social interactions through their use of digital technology, including the internet, video games, and computer games.

When the preceding considerations are taken into account, it is possible to arrive at the conclusion that games, and especially digital games, have a considerable influence on the world that children inhabit. To ensure that children benefit constructively from playing digital games, it is vital to provide them with appropriate guidance. According to Sadiman et al. (2011), digital games in education relate to the utilisation of digital games for the purpose of achieving educational goals, with the tools, rules, and questions being altered in order to better fulfil this particular function.

According to *Permendikbud* number 65 of 2013, an essential component in the field of education is the development and maintenance of a healthy balance of one's hard skills, which are more colloquially referred to as one's physical capabilities. Hard skills are a set of talents that are needed for executing tasks that are relevant to a career. These skills are also commonly referred to as intellectual intelligence (IQ). These competencies involve broad as well as specific knowledge (Azzet, 2010, p. 10). The use of digital games in the classroom has the potential to help young people develop a wide variety of hard skills, such as competency in arithmetic, the ability to acquire languages, and reading competence.

In light of the background information provided, the author intends to underline the significance of Education in Society 5.0, which plays a role in the development of educational procedures and has an impact on the progression of educational practises. There is a possibility that the improvement of children's growth, particularly in the acquisition of practical skills, can be accomplished through the utilisation of technical breakthroughs in the production of educational games and applications. This study will

illustrate the educational potential of digital games as a medium for strengthening children's hard skills. The goal of this study is to demonstrate the educational potential of digital games. In addition to this, it intends to shed light on the particular information and skills that children get as a result of participating in educational videogames and investigate the significance of the educational opportunities afforded to them in the context of the 5.0 Digitalization Era.

RESEARCH METHODOLOGY

In this particular investigation, library research served as the major approach; more specifically, the research method known as the literature study was utilised. The objective of the research process known as a literature study is to compile and analyse the results of previous studies that are pertinent to the topic that is being investigated. It entails studying the opinions of specialists as expressed in written documents, in addition to analysing the major findings and insights from past studies (Snyder, 2019).

The process for collecting the data involves acquiring a selection of scholarly publications that focus on the utilisation of Digital game Education as a means of supporting the acquisition and upgrading of Hard Skills in children and young adults. In addition to that, the researcher carried out an in-depth evaluation of the data by making use of descriptive qualitative analysis and by performing an exhaustive literature review on the topic at hand. The results of this study materialised in the form of descriptive data that was provided in written words. These data were drawn from the findings of previous research projects.

RESULT AND DISCUSSION

The approach that was used to collect data involved compiling a number of research articles that explicitly addressed the use of Digital game Education as a strategy for boosting the acquisition and improvement of Hard Skills among young individuals. This was done in order to obtain the necessary information. In addition, the

researcher carried out a comprehensive study of the data by employing descriptive qualitative analysis and meticulously evaluating relevant literature. The findings of this investigation were presented in the form of descriptive data that was written out in sentences. These descriptive data were gathered from earlier research initiatives.

Researchers are currently investigating the use of Digital Game Education as a means of facilitating children's acquisition and development of Hard Skills. In this context, they are actively seeking diverse sources of information pertaining to the creation and implementation of Digital Games within the educational domain. The following references have been examined by our team of researchers.

The first example is a 2019 publication by Qadhli Jafar Adrian and Apriyanti titled "Android-Based Mathematics Learning Educational Game for Grade 1 and 2 Elementary Children." This research will focus on the creation of educational video games with the intention of encouraging students to have a more favourable disposition towards math. Young students frequently perceive mathematical concepts as being challenging because they believe they are challenging to understand. This endeavour involves introducing educational content into the framework of games with the goal of promoting learning and boosting the comprehension of mathematics among players in a manner that is more engaging and fun in nature. The application for the math game was put through its paces by elementary school pupils in grades 1 and 2 at SD Negeri 2 Labuhan Dalam, which is located in Bandar Lampung. The use of a questionnaire is a component of the testing process. The gaming application that was produced was given an average score of 96%, which was sufficient to place it in the "Very Good" category following the testing that was conducted using the student questionnaire data. According to the results of this research, the fact that students have a preference for math instructional games makes it easier for them to acquire new arithmetic skills and improve those they already have.

The second reference is a paper published in 2022 under the name "Development of an Android-based Mathematics Education Game Application for SD 02 Pagi Pondok Labu with the Rapid Application Development Method Using Adobe Flash CS6" and written by Jonathan Manik, NM Faizah, and Winton Ginting. The

creation of educational applications for the purpose of learning, with a particular emphasis on mathematics, in the form of games based on Android is the goal of this project, which will be developed and constructed. The findings of the research reveal that utilising math instructional games leads to an improvement in students' understanding of fractions as a result of partaking in gameplay activities that are provided by the games. It has been demonstrated that the use of a mathematical educational game can promote student engagement and participation, which in turn leads to an increased propensity for students to ask the teacher for clarification. This heightened curiosity is a direct result of their desire to acquire the essential information and abilities to successfully navigate the game's challenges, which in turn facilitates their own learning and assists the teacher in assessing the students' mathematical grasp.

The third reference is a paper published in 2021 under the names Prabowo, R., M. Jasa, A., and Oktriza, M. It is titled "Android Educational Game Application to Enhance English Proficiency: A Case Study of 'Kids ABC' for Elementary School Level Students." The purpose of this research is to improve the level of engagement and appeal of study materials in order to make the process of students improving their English language skills easier. At Basirih 1 Elementary School, a total of 32 people took part in the examination and evaluation of educational video games. The average sufficiency rating of 73.15% indicates that the educational games available in English are of admirable quality, according to the research's findings. A score of 72.55 percent was obtained on the balancing test as a result of the evaluation of the overall quality of English educational games. In addition, the game tests that satisfied the requirements were given a quality rating of 75%, while the usability test indicated that the games that fulfilled the requirements had a quality rating of 74.32%.

The title of the fourth reference is "Development of a Biometric Educational Game to Enhance Student Learning Outcomes in Mathematics for Elementary School Class 1" (Arifah, R.E.N., Sukirman, & Sujalwo, 2019). This citation was published in the year 2019. The purpose of this research is to develop a mathematically themed instructional game for first-grade students at elementary schools called "Bilomatics." The game's primary focus will be on the various mathematical principles. The purpose of the game is to act as a teaching aid throughout different types of educational activities. The study was carried out by utilising pre-test and post-test measures that

were given to a sample of 25 students from SDN 77 Nayu Surakarta in order to conduct the analysis. These tests were carried out both in advance of and after the participant's participation in the Bilomatics game. According to the results of this research, playing the game that was used for the study significantly improved participants' knowledge of mathematical concepts, particularly those that were associated with numbers. The findings of the pre-test and post-test N-gain normality tests, which together produced a value of g = 0.72, lend credence to the assertion that this conclusion is correct. This score is within the high range for the criteria, providing additional evidence that the game is effective in enhancing players' grasp of mathematical topics. On the other hand, the overall student response rate to utilising the Bilomatics game is 89%, which means that it satisfies the reasonable standard.

The fifth citation is titled "Development of an Android application in the form of educational games based on local culture for enhancing grade 1 SD/MI students' beginning reading skills" (Kharisma, G.I., & Faizal, A., 2019). Kharisma and Faizal were responsible for writing it. The purpose of this project is to develop an application for Android that will consist of instructional games based on the culture of the indigenous people who originally inhabited East Nusa Tenggara. The reading skills of first-grade students in schools located in South Dakota and Michigan are going to be improved thanks to these games. The results of a limited trial that was conducted at Madrasah Ibtidaiyah Public North Central Timor on a sample of 28 children in first grade suggest that the created learning application product is viable for implementation. The findings of classroom observations, which show that the four components included in learning application products acquire a percentage score that is higher than 85%, support this argument. This finding lends credence to the aforementioned assertion.

The sixth reference is a paper by Santika, R. R., Kurnia, A., Mochamad, S., and Safitri titled "Implementation of English Learning Educational Games Using the Game Development Life Cycle Method and Bloom's Taxonomy Approach" (Santika, R. R., Kurnia, & Safitri, 2019). The purpose of this research endeavour is to build an educational game with the working title of Adventure Education Game. The game will have the goal of improving children's acquisition of the English language using a

method that is both more interesting and more interactive. The outcomes of the research reveal that an educational game known as Adventure Education Game has shown great efficacy as a learning tool for youngsters to recognise English-language things. The game is called Adventure Education Game. This conclusion is backed by the findings of the beta testing, which showed that 46% of participants reported improved English proficiency with a good score. This conclusion is supported by the findings of the beta testing. In addition, the game's attractiveness to children is enhanced by the incorporation of an intriguing narrative that drives the action. In addition, the Bloom's Taxonomy methodology for teaching English is utilised within this instructional video game, which allows teachers to evaluate their students' level of English fluency once they have completed the game.

According to the findings of a study that looked at six academic publications, it is clear that the use of digital games education as a teaching medium has a beneficial impact on the improvement of children's hard skills, particularly in terms of the growth of their intellectual intelligence (IQ).

CONCLUSION

In light of what has been stated up to this point, it is reasonable to draw the conclusion that the introduction of digital technology in the 5.0 era will bring about positive developments in terms of educational progress. One important component is the development of educational video games, which have the ability to improve children's cognitive capacities, particularly in terms of their intellectual proficiency (hard skills). This is a prominent facet. This assumption is supported by the existing body of research on the application of digital game education, which has been found to increase children's desire towards learning, which in turn leads to a proportional improvement in their cognitive abilities.

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