https://journal.ypidathu.or.id/index.php/jete/
P - ISSN: 3025-0668
E - ISSN: 3025-0676

Evaluation of the Effect of Using Educational Games on Early Childhood Learning Achievement

Lilis Nurteti [1], Mansyur Srisudarso [2], Annisa Wahyuni [3], Mariatul Kamila Ramadhan [4], Maulana Paramaditya Ananta [5]

[1] Institut Agama Islam Darussalam Ciamis, Indonesia
[2] Universitas Singaperbangsa Karawang, Indonesia
[3] Sekolah Tinggi Agama Islam Negeri Mandailing Natal, Indonesia
[4] Universitas Negeri Malang, Indonesia
[5] Universitas Negeri Malang, Indonesia

ABSTRACT

Background. Early childhood from 3-5 years old is classified as a digital native generation. This is triggered by the dependence of individuals on technology. The ease of access in the form of videos and other entertainment will trigger children to do activities. This aspect will help in providing stimulation for children while parents are busy with work. The use of educational games is one form of the role of technology use on the motor and cognitive development of children.

Purpose This study aims to investigate how influential the use of educational games is. Looking for shortcomings and advantages in the use of educational games to be evaluated. Educational games that present interesting animations and images will captivate children when they see them. This will make children enthusiastic and easy to remember things.

Method. The method used in this research is a qualitative method. This method is a way of research that uses numbers. The data collected comes from a questionnaire distributed to teachers at an early age level. The statements presented are loaded on Google from to facilitate access from teachers without taking time. The statements presented are related to evaluating the effect of using educational games on early childhood achievement. The collected data will later be transferred to Excel. After that the data will be inputted into spss to do the oneway anova test.

Results. The result of this research is the use of technology in the form of educational games will help optimize the development and growth of early childhood. However, not all educational games are able to accommodate balanced and comprehensive development. It takes the role of parents and teachers to control the use of technology in early childhood so as not to get addicted.

Conclusion This research can be concluded that the use of technology in the form of content, educational games and other things in proportion will help improve the learning achievement of children. Proper use according to portions will help without replacing the role of parents and teachers.

KEYWORDS

Early Childhood, Educational Games, Trigger Children

Citation: Nurteti, L., Srisudoarso, M., Wahyuni, S., Ramdahan, K, M., Ananta, P, M. (2024). Evaluation of the Effect of Using Educational Games on Early Childhood Learning Achievement. *Journal Emerging Technologies in Education*, *2*(1), 83–97.
https://doi.org/10.70177/jete.v2i1.755

Correspondence:

Lilis Nurteti,
lilissuma@gmail.com

Received: March 04, 2024

Accepted: March 11, 2024

Published: March 12, 2024

INTRODUCTION

Early childhood is often referred to as the golden age. This is the age of rapid development and growth of the individual (Agnafors, 2021; Ahmed, 2019; Ardoin, 2020). Early childhood is a unique individual who has a special pattern of physical, cognitive, socio-emotional, creativity, language and communication growth and development according to the stages passed by the child (Arslan, 2021). During this period, the development of each child is different. Nutrition obtained from both food and drink must be balanced and can stimulate the body to grow and develop properly (Askie, 2020; DiGirolamo, 2020). This period is a time when children are not yet able to develop the potential in themselves (Piasta, 2020). The tendency to play, want to win alone, and often change the rules of the game for personal interests. This requires educational efforts to optimize all aspects of development and growth, both physical and psychological.

The development that occurs in early childhood must also be optimized with a variety of learning that stimulates physical and psychological development. Technology has provided easy access and presents various forms of features supporting the educational process. One aspect of the discussion is educational games. Educational games are all innovative forms of technology designed to educate and entertain users while still presenting educational elements (Baigi, 2022). Educational games aim to provoke children's interest in learning materia (Castronovo, 2019). Various and interesting forms of presentation ranging from colors, numbers, letters and many more. This is a form of support from digital technology in the world of education (Antonova, 2019). The role of teachers and parents will determine the efficient use for children, especially minors. Educational games will help children learn many things that will train cognitive, social and emotional skills.

Education is the first step towards an advanced civilization. Early childhood, which is the center of the early formation of skills and rapid development, must be given the right education. The use of educational games that have innovations to improve children's skills will help children's development at an early age. The use of digital technology in education is not new anymore. The supervision of parents and teachers when using educational games will support the success of early childhood learning. Early childhood is a stage of rapid development that will be able to understand, remember, and apply something they see. For this reason, the proper use of educational games will be a way to achieve an effective learning process.

Research on evaluating the effect of using educational games on early childhood learning achievement has deep reasons to be researched. This is in the form of evaluating things that are deemed necessary in the use of educational games for early childhood (Belogianni, 2019; Carrion, 2019). This reason is also supported by the learning achievement of early childhood sat using educational games. Early childhood children who are more classified as playful will be helped to learn with educational games. The presentation of educational games that are interesting, colorful, and also moving will make children pay attention to learning (Oranç, 2019). This will also improve children's memory and understanding of learning. The presentation of educational games in the form of games by applying learning will hone the motoric and cognitive skills of children. The use of educational games will make it easier for teachers to deliver material. For example, when the material presented by the teacher is related to objects that cannot be shown directly, using this application will present pictures or puzzles.

Evaluating the effect of using educational games on early childhood learning achievement will be very important (Zaug, 2022; Zeng, 2020). This fact is supported by the problems that occur in the learning process that must be followed up. Likewise, with the use of educational games, problems must be known to overcome and prevent the occurrence of the same problems and related problems (Yuxuan, 2021; Zahed, 2019). The use of digital technology that cannot be rejected in the world of education has become a new challenge. In addition to being a challenge, the presence of digital

technology is also a new opportunity in improving the quality of education (Xiong, 2022; Yeşilbağ, 2020). To improve this quality, an evaluation is needed to measure the level of success in the use of technology in education, especially in this case educational games (Vocaturo, 2019; Wronowski, 2020; Xie, 2021). In this research, educational games are aimed at young children who are underage users. For this reason, extra work is needed to ensure that children are not contaminated by negative things when accessing educational games.

This research will contribute to the use of educational games that affect early childhood learning achievement. The effect of using educational games will provide a new way of delivering material by the teacher (Bazargani, 2021; Schachter, 2019; Shonkoff, 2020). This influence will encourage teachers' willingness to use educational games. In this study, the researcher will help find all the obstacles and risks if using educational games for early childhood. Researchers will also help identify how much influence the use of educational games has on the learning process. This will help teachers in making the first steps before using educational games. Teachers will also be able to analyze what kind of educational games are suitable for early childhood. Games that are able to stimulate children to think creatively and innovatively and are able to improve their skills. Researchers will also provide examples of the form of educational games to teachers. Some things in this research will help fill the gaps that occur in the teaching and learning process to improve early childhood achievement.

This research will provide a new innovation from previous research. In the research (Bulut, 2022) entitled The effect of educational game design process on students' creativity. The research discusses how children in the 2020s spend most of their time in front of layers. The research also focuses on designing educational games in a blended learning environment for elementary school students in grades 5 and 6. Whereas this research focuses more on evaluating the use of educational games in elementary school children. Another difference is that this research is a form of application of educational games while Bulut's research focuses more on designing or making educational games. So that this research contains conclusions in the form of forms of action that can be taken when using educational games to early childhood.

The reasons that arise when considered, the researcher aims to answer the questions that arise. Firstly, does the use of educational games for early childhood have a positive impact? Second, can the use of educational games support and improve the skills, creativity, and understanding of early childhood?. Third, what are the risks that often occur when using educational games?. Fourth, what is the evaluation of the use of educational games in improving early childhood learning achievement? Researchers hope that with this research, teachers and parents are able to utilise educational games to increase learning from early childhood. Researchers also hope that parents and teachers continue to supervise the use of technology for early childhood. In addition, hopefully this research can be taken into consideration for further research and related research.

RESEARCH METHODOLOGY

Research Design

This research uses qualitative methods. A method that presents results in the form of numbers that can be measured. This research was chosen to measure and analyse early childhood achievement in learning when using educational games (Castro, 2019; Chaudy, 2019). In addition, it also compares between before using and after using educational games. The use of qualitative methods will also make it easier for researchers to measure the number of responses obtained. The data will present evidence or information that can be analysed to evaluate the effect of using educational games on early childhood learning achievement. The results of the comparison will be processed to match the circumstances that occur in the field. This research will explain in detail the variable parts used in the

research to influence each other. The results of the data obtained are data from google from designed for nearby educational institutions. Google from contains statements about the significant influence on the evaluation of the use of educational games. Furthermore, the data was processed through SPSS using the oneway anova test. This is done to gain an in-depth understanding of how much influence the use of educational games has and how the form of evaluation that can be done on educational games in early childhood.

Research Procedure

This research was conducted by asking permission from the teacher concerned and working with parents of early childhood. Then each questionnaire that has been inputted in the form of google from is filled in by the teacher until it reaches the filling target which is considered sufficient to fulfil the research acquisition. In this study, it is very important to pay attention to ethics in making questionnaires and distributing questionnaires. The form of ethics in making questionnaires is to use language that is polite, good, correct, and easy to understand. While ethics in distributing questionnaires, researchers do not force teachers to fill in google from so that teachers feel comfortable in responding. So that teachers can respond easily and in a fast time. This will make it easier to analyse the various problems that teachers often face when using learning media, especially educational games. Teachers will also be able to think with cognitive abilities comparing things that happen during the learning process and interaction with children.

Research Subjects

This study covers early childhood education institutions in several regions. This research is important to ensure that the use of educational games can have a positive effect on early childhood learning achievement. This research is also useful for evaluating things that are considered important in order to avoid problems in the future. In addition, it is useful to minimise the risks that arise. Participants in this study consisted of teachers of early childhood children who were taken randomly. In addition, researchers also involved parents to obtain information related to the effect of using educational games on early childhood achievement.

Research Ethics

Ethics should not be missing in a research. This is because ethics are manners, principles, norms that govern the behaviour of researchers in carrying out research (Ballantyne, 2019; Beardsley, 2019; Black, 2018). It includes consent and permission from the institution or individual. In this study, 25 early childhood educators were randomly selected to participate in answering questions. Data collection came from people close to them who had taught at the early childhood level. Researchers will maintain the security of research data and consider efforts to protect the personal data of participating teachers and parents. The research was also conducted in a fair and impartial manner, and did not discriminate against the subjects. The researcher does not impose his/her will on the research subject to maintain the comfort of the party. All information and data from the research avoided the recognition of other people's property rights. In addition, researchers also give appreciation to all parties who have helped and contributed to this research.

Data Collection Technique

Data collection in this study used a questionnaire that was loaded on Google from and distributed on 31 February 2024 to 1 February 2023. Distribution of google from to teachers via WhatsApp. The results of the data collected are the total percentage of responses to the statements given. The results of the data were then transferred in excel form to facilitate the data processing process using SPSS. Its usefulness is to show the teacher's response to the use of educational games in improving early childhood learning. This will provide how much influence and evaluation is

needed in the use of this educational game. This data will be presented using numbers and explained the highest response to the statements submitted.

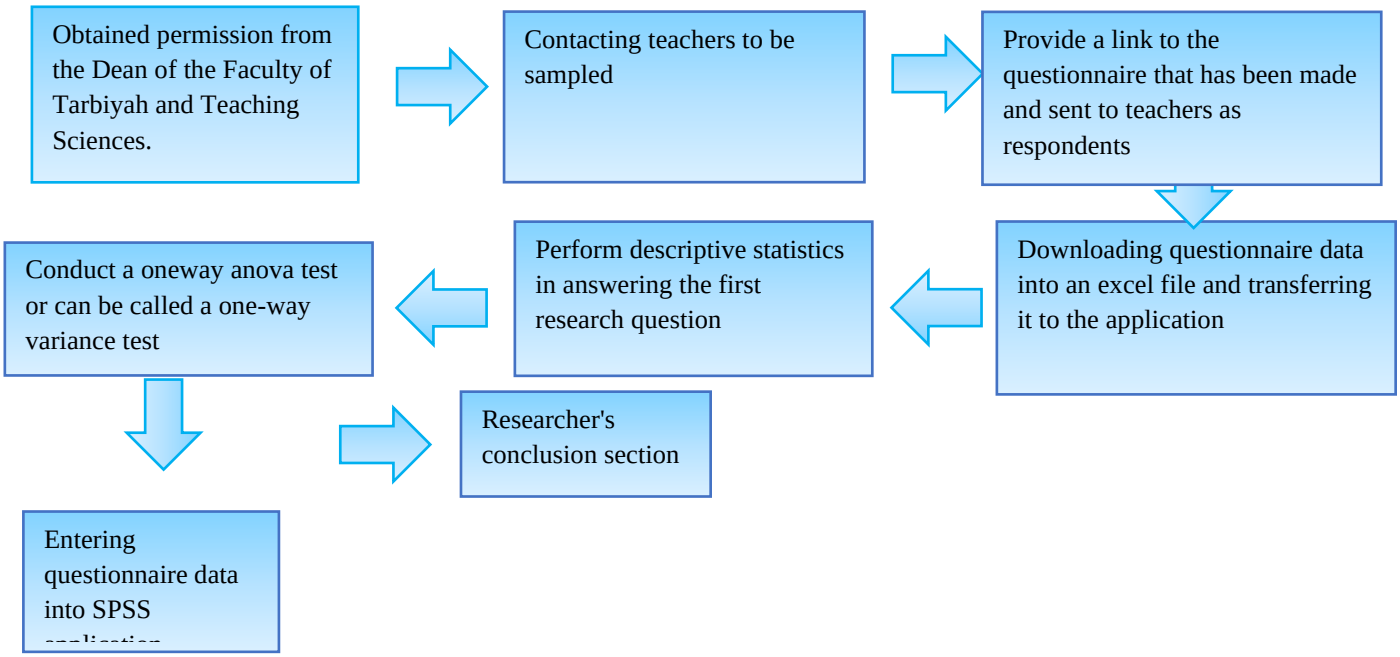
Table 1 Sample population

NO	**Department of**	Number of Participants	Percentage
1.	Teacher Before Use	**10**	**40%**
2.	Teacher After Use	**15**	**60%**

Table 2 Research Sample Details

No	**Choice Category**	Tier Number
1	Strongly Agree (5)	**>90%**
2	Agree (4)	**70-80%**
3	Disagree (3)	**50-60%**
4	Strongly Disagree (2)	**0-40%**
Total		**100%**

Data collection and data analysis tools



RESULT AND DISCUSSION

Educational games are actually a game created for early childhood learning in increasing interest in learning. Educational games that are presented interestingly will tend to increase high curiosity. Early childhood that has high curiosity will be captivated by interesting things. Educational games can also be an alternative to reduce and avoid boredom in early childhood. This method will increase children's creativity which will stimulate them to learn more focused and enthusiastic. Early childhood is fairly fond of playing so educational games will not interfere with that. This is because educational games are learning materials designed to be used as games. This achievement must of course be in the right manner and also accompanied by educators who master the skills in attracting children to play educational games.

Educational games that appear more often are found on smartphones. This will increase the use of smartphones in education. So parents and teachers will have to do extra work in supervising children when using smartphones. There are several examples of the use of technology-based educational games such as True Colorss Color Theory Learning Game. This game has a concept in

colour guidance. For example, colour mixing is only done by clicking on the icon listed. This will reduce the risk of the child getting dirty or the colour paint being eaten by the child. In addition, this method will not cost a lot to buy the equipment. The use of digital technology in the form of educational games is the first step in introducing technology to children by considering all the risks that will occur.

The table presented below is the result of obtaining teacher responses before using educational games at the early childhood level. The number of respondents was 10 people who were randomly selected. The table shows the percentage of responses to the statements submitted. There are various views on the results of the statements submitted. Things that usually happen before using educational games in early childhood. A creative and interesting media will greatly affect the enthusiasm, liveliness, and participation of children and teachers in learning. The material will also be easy to convey and absorbed by children. So that the learning process will be more conducive and active.

Table 3 Responded by Teachers Before Using Educational Games on Early Childhood Learning Achievement

NO	Question	SS (%)	S (%)	TS (%)	STS (%)
1	The development of gross and fine motor skills in children was maximised before the use of educational games	47%	33%	17%	3%
2	Children's level of understanding of basic concepts such as numbers, letters and colours before engaging in the use of educational games was low	43%	33%	20%	3%
3	Children already had the ability to recognise patterns, shapes and sizes before using educational games	43%	47%	7%	3%
4	Children have sufficient understanding of the concepts of space, time and relationships between objects before they start using educational games	50%	30%	17%	3%
5	Children are able to follow instructions from the teacher before using educational games	47%	43%	10%	0%
6	Children are able to complete simple tasks before the use of educational games	50%	40%	10%	0%
7	Children were able to solve problems in the game before using the educational game	43%	37%	20%	0%
8	There was confusion from children when playing the game before using educational games	47%	33%	20%	0%
9	Learning evaluation was easier before using educational games	33%	40%	23%	3%
10	Children were more skilful before using educational games	47%	27%	23%	3%

The statement above has the highest response of 50% which states that children have a sufficient understanding of the concepts of space, time, and the relationship between objects before they start using educational games. The statement was a strongly agree response followed by a 30% agree statement. Before the use of educational games, children are ensured to have an understanding of the concept of space, and the relationship between objects in order to facilitate the application of educational games. However, the way of understanding from each child is different. This is due to different ways of understanding, there are some types of children who only use theory or hear only. On the other hand, there are children who need direct practice or direct media that illustrates the learning discussion. The statement that children were able to complete simple tasks before the use of educational games had the same response as the previous statement. They strongly agreed and agreed with the statement. The argument was supported when giving questions or activities in the teaching and learning process. Children have been able to solve the problems they are facing.

There were several statements that disagreed with this. The statement about children being more skilled before using educational games. This is because before using educational games, there were children who did not understand the concepts that had been given. So that there is confusion when doing something in their daily lives. When using educational games, children will immediately see the method, form, and how it is applied in everyday life. This is followed by the statement that learning evaluation is easier to do before using educational games, which has a response of disagree and even strongly disagree. When not using educational games, children will be passive and teachers are more active. So that teachers will have difficulty seeing the abilities of children and their weaknesses. This will complicate the evaluation process in learning. when teachers do not know the strengths and weaknesses of children when learning. The level of achievement of children will also be difficult to analyse.

Table 4 Responded by Teachers After Using Educational Games on Early Childhood Learning Achievement

NO	**Statement**	SS (%)	S (%)	TS (%)	STS (%)
1	There is an improvement in children's ability to apply concepts learnt from the educational game	57%	40%	3%	0%
2	There is an increase in children's motivation and interest in learning after engaging in the use of educational games	60%	33%	3%	4%
3	There is a sustained positive impact of using educational games	60%	30%	7%	3%
4	Children are more creative and innovative after using educational games	53%	37%	10%	0%
5	Children actively participate after using educational games	57%	33%	10%	0%
6	Children are more likely to interact socially when using educational games	60%	20%	17%	3%
7	There are specific aspects of the educational game that are challenging.	60%	30%	10%	0%
8	Children have a developing understanding of the concepts of space, time and relationships between objects after consistent use of educational games	53%	43%	3%	0%

9	There is improvement in the child's ability to recognise patterns, shapes, sizes and colours after using educational games	57%	40%	3%	0%
10	The use of educational games in improving early childhood learning is efficient	63%	30%	7%	7%

The highest response from the teacher data table after using educational games in learning falls on the statement that the use of educational games in improving early childhood learning is efficient. This is considered efficient because educational games are able to provide learning experiences that are interesting, challenging, and even child-centred. Children's involvement when using educational games will be more likely to keep children motivated while playing. The use of educational games will also make lessons more active in early childhood. From educational games children can try without fear of failure due to features that present no serious consequences. So children will be able to try without fear of judgement or punishment. This will increase children's confidence in what they are doing.

The next highest achievement is in the statement that there is an increase in children's ability to recognise patterns, shapes, sizes and colours after using educational games. There are several reasons for this improvement because educational games provide repeated practice in recognising patterns of shape, size and colour. With consistent training, children can strengthen memory and concentration in the brain related to recognition and understanding. Educational games also provide opportunities to interact directly with various shapes, sizes and colours. Educational games are also often presented in a context that is relevant to children. For example, children can learn about colours and shapes through interesting pictures or stories related to everyday life.

Table 5 Responded by teachers before using educational games on early childhood learning achievement

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
X.1	Teacher Before	6.233	6	1.039	4.675	.117
	Teacher Before	.667	3	.222		
	Total	6.900	9			
X.2	Teacher Before	5.333	6	.889	4.000	.141
	Teacher Before	.667	3	.222		
	Total	6.000	9			
X.3	Teachers Before	3.600	6	.600	.	.
	Teacher Before	.000	3	.000		
	Total	3.600	9			
X.4	Teachers Before	6.100	6	1.017	1.525	.392
	Teacher Before	2.000	3	.667		
	Total	8.100	9			
X.5	Teachers Before	2.933	6	.489	2.200	.276
	Teacher Before	.667	3	.222		
	Total	3.600	9			
X.6	Teachers Before	6.233	6	1.039	4.675	.117
	Teacher Before	.667	3	.222		

	Total	6.900	9			
X.7	Teachers Before	7.600	6	1.267	.	.
	Teacher Before	.000	3	.000		
	Total	7.600	9			
X.8	Teachers Before	5.600	6	.933	.	.
	Teacher Before	.000	3	.000		
	Total	5.600	9			
X.9	Teachers Before	7.433	6	1.239	5.575	.093
	Teacher Before	.667	3	.222		
	Total	8.100	9			
X.10	Teachers Before	10.933	6	1.822	8.200	.056
	Teacher Before	.667	3	.222		
	Total	11.600	9			

Tabel diatas merupakan sampel jawaban responded dari guru sebelum menggunakan game edukatif terhadap early childhood learning achievement. In the statement that children are more skilled before using educational games with the acquisition of a total sum of squares of 11,600, df of 9. Furthermore, followed by the average squares of 1,822, the acquisition of F as much as 8,200 and Sig 056. This statement states that children's skills are not maximized before using educational games. Supported by understanding concepts that sometimes make children confused. Before the use of educational games, some children have not been able to associate context with meanings that are relevant to everyday life. Early childhood children who are classified as playful will get bored when not given material that makes children active in learning. This will make children passive and unable to improve their skills in learning.

Table 6 Responded by Teachers After Using Educational Games on Early Childhood Learning Achievement

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
X.1	Teacher After	1.833	6	.306	1.375	.428
	Teacher After	.667	3	.222		
	Total	2.500	9			
X.2	Teacher After	4.933	6	.822	.925	.574
	Teacher After	2.667	3	.889		
	Total	7.600	9			
X.3	Teacher After	5.433	6	.906	1.019	.538
	Teacher After	2.667	3	.889		
	Total	8.100	9			
X.4	Teacher After	3.433	6	.572	2.575	.234
	Teacher After	.667	3	.222		
	Total	4.100	9			
X.5	Teacher After	3.433	6	.572	2.575	.234
	Teacher After	.667	3	.222		
	Total	4.100	9			

X.6	Teacher After	3.600	6	.600	.900	.585
	Teacher After	2.000	3	.667		
	Total	5.600	9			
X.7	Teacher After	2.100	6	.350	.525	.770
	Teacher After	2.000	3	.667		
	Total	4.100	9			
X.8	Teacher After	2.933	6	.489	2.200	.276
	Teacher After	.667	3	.222		
	Total	3.600	9			
X.9	Teacher After	2.100	6	.350	.	.
	Teacher After	.000	3	.000		
	Total	2.100	9			
X.10	Teacher After	2.100	6	.350	.525	.770
	Teacher After	2.000	3	.667		
	Total	4.100	9			

The table above is a sample of teacher responses after using educational games in early childhood learning. In the statement that the use of educational games in improving early childhood learning is fairly efficient, the results of the total sum of squares are 4,100, df 9 and average square 350 with F 525 and sig 770. From this data there is a significant difference between the two tables. This strengthens the statement that before using educational games is less efficient and after using educational games the learning improvement of children occurs. Efficiency is seen when educational games provide interesting, challenging and child-centered learning experiences. Some educational games are intentionally designed to develop critical problem-solving skills. Educational games are also designed to enhance creativity, cooperation and social skills. This will help children to develop the necessary skills to be able to condition themselves in everyday life.

Influence of Prior Use of Educational Games on Early Childhood Learning Achievement

The use of interesting learning media will allow the fulfillment of needs in early childhood education. Early childhood who prefer to play will be captivated by learning media that will not interfere with their playtime. It will be different with the use of monotonous and passive learning methods. Early childhood will have difficulty in understanding and will also feel bored while learning. The boredom that occurs during the learning process will make children's memory and understanding decrease. At this age, children are experiencing rapid growth and development. It is important to provide knowledge that is useful in daily application to children. This will be useful to increase self-confidence and become an effort for children to be themselves.

Teachers as educators must certainly pay attention to this. The development of gross and fine motor skills in children must be maximized before the use of educational games. The lack of early childhood understanding of basic concepts such as numbers, letters, and colors must be pursued. The form of effort that can be made is the appearance or direct practice in children of these basic concepts. When learning is fairly passive, it is likely that children will become uninterested in learning. This will affect the motivation of the child to understand what is delivered. A rigid and monotonous approach to learning can cause children to lose their enthusiasm, interest and motivation to learn. Learning without using educational games will be less interactive. Children at an early age learn best through direct experience and active interaction with learning materials.

Active interaction is required for effective learning. Traditional learning methods do not allow children to develop cognitive and motor skills optimally. During this period, children need stimulus

funds that stimulate development. This is not available in conventional learning. Monotonous learning can increase the risk of children losing focus during the learning process. This boredom can hinder the effective absorption of information. Without adequate interaction, children will find it difficult to understand and internalize learning. Lack of practice and hands-on experience can hinder children's ability to deepen their understanding of the concepts taught. It is therefore important for parents and educators to consider using varied learning methods to ensure that children can learn in an effective and enjoyable way.

Learning without using educational games in early childhood can have a negative impact on children's understanding. The bad effect of this is that children are less concentrated in learning. This is a bad effect because it can reduce the child's ability to focus and understand the material well. Furthermore, less social, when children do not use educational games, they will most likely lose the opportunity to interact, communicate, and cooperate with peers, teachers, or parents. This will lead to a lack of self-confidence and empathy in children. Early childhood who learn without using educational games will be able to access the wrong information without selection in the future. This can endanger the child because the information obtained can be irrelevant and even dangerous for him.

The Effect of Using Educational Games on Early Childhood Achievement

Educational games are games designed to provide fun and meaningful learning experiences for early childhood. Educational games are not only through gadged but can be traditional games, toys that contain educational or learning elements. The use of educational games must pay attention to learning objectives and curriculum targets. Learning objectives to be achieved such as cognitive, affective, and psychomotor aspects must be met. The use of educational games in increasing children's learning motivation. Educational games that are presented with their uniqueness and attractiveness make children's spirits rise. It also arouses interest and challenges children to learn new things. Educational games can also increase children's confidence and satisfaction in learning.

Educational games can provide feedback and rewards for success in the game. This can increase children's confidence and satisfaction in learning. Children at this time are very fond of appreciation or reward. Educational games can train the ability to think, remember, reason, solve problems and make decisions. This training is a form of cognitive skills for early childhood that can develop children's imagination, creativity and innovation in creating something new. Educational games will also be able to improve social-emotional skills that can help early childhood to identify themselves, express feelings, control emotions, and respect others. The facility of educational games is also interaction, communication, cooperation between early childhood with peers, teachers, or parents.

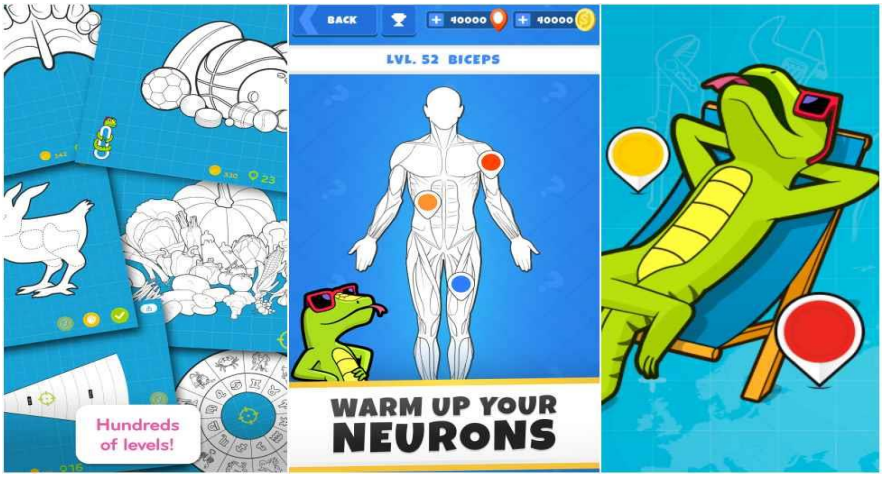
The games presented by educational games will be able to improve motor skills in children. Educational games can involve early childhood body, hand, eye and mouth movements. Early childhood who are used to imitating, hearing, and doing will be easy to practice in everyday life. Educational games can also improve coordination, balance, speed, and accuracy of early childhood movement. Guidance from teachers as educators in formal institutions is needed. The use of traditional educational games must be used appropriately and according to purpose, while digital-based educational games will require extra work from teachers and parents in their use. This is because digital technology is something that is easy to access, do not let children be made bad by technology itself. Here are some forms of educational games:

1. Khan Academy Kids

Figure 2

This game is an application that uses game-based learning for early childhood. It includes thousands of interactive activities that train reading, language, writing, math, social-emotional development, problem solving, and motor development skills. The game also adapts learning materials that match the curriculum and basic competencies. The function of Khan Academy Kids game is to provide a fun, effective and meaningful learning experience for early childhood. This game can increase motivation, concentration, creativity, and early learning achievement.

2. 94 Degrees: Fun Trivia Quiz



94 degrees shows Toppers' temperature as the child plays and with answers. The concept of the game is to guess from limbs, countries, and even fruits. A simple yet challenging game that is suitable for children to hone their motor skills.

3. Coloring and Learn

Motor skills can be developed by coloring as a medium of expression, dexterity, and training children's concentration. This game will introduce children to animals, vehicles, alphabers, numbers, dinosaurs, and many others.

Some forms of educational games based on digital technology can be used in learning for teachers and parents while still paying attention to how children learn. In addition, periodic supervision of children to avoid misuse. Besides that, it requires in-depth evaluation when using educational games in learning to achieve the quality of early childhood learning. Educational games that can be effective and fun learning media for students will provide positive feedback for teachers as a variation in learning. So that the learning process can be carried out conducively and the needs of children and teachers in education are achieved.

Evaluation in the use of educational games can be continuous with a form of formative evaluation. This evaluation is carried out on an ongoing basis during the learning process. The aim is to monitor the progress, weaknesses and needs of early childhood in using educational games. The use of educational games requires proper understanding in order to adjust the use of the right media. Evaluation can be done by testing the ability of children to learn. The goal is to find out the extent to which educational games are in accordance with the goals, characteristics and needs of early childhood. Looking for deficiencies that occur in the learning process when using educational games and providing improvement feedback.

In addition to several things that support educational games, of course there are negative parts in their use. Educational games that are too interesting and fun will also affect the concentration level of the child. This will make early childhood addicted, lose track of time, and forget about other important activities. Educational games that are too individualistic, competitive, or aggressive can make children become anti-social, selfish, defiant, unwilling to share, and even unwilling to cooperate. Prolonged use of educational games will result in a decline in children's health. Especially early childhood which is in its development and growth period. Uncontrolled use of educational games that are not even suitable for children will cause lelaah, headaches, stiff neck, and even insomnia. Educational games can also cause conflicts, disputes, or violence between early childhood and other people. Therefore, the level of vigilance of teachers and parents must be more selective in the use of educational games for children.

CONCLUSION

In recent years, evaluating the impact of using educational games on young children has attracted the attention of researchers, educators and parents. This conclusion summarizes some important findings and implications related to the use of educational games in early childhood. First, research shows that the use of educational games can have significant benefits for early childhood development. It helps improve cognitive skills such as problem solving, math skills, language and fine motor skills. It can also improve children's mental resilience and expand their knowledge of various subjects. In addition, educational games can also be an effective tool to increase children's motivation and participation in learning. With interesting and interactive designs, children tend to be more focused and motivated in learning.

This positively changes students' perception of learning and provides a solid foundation for their future educational interests. However, the use of educational games also raises some concerns. For example, spending too much time in front of a screen can affect a child's social and physical development. Parents and educators need to be aware of time limits and ensure that children continue to engage in physical activity and healthy social interactions. In addition, the quality of educational game content is also very important. These games should be designed with the principles of effective

learning and early childhood development in mind. Teachers and parents should therefore provide developmentally appropriate challenges to children and provide constructive feedback to help them learn better. In addition, the role of parents and educators who accompany children in the use of educational games is also very important. They should be actively involved in monitoring and managing the use of the games, providing necessary support and facilitating reflection and discussion on children's learning experiences.

Further research is needed to fully understand the long-term impact of using educational games on early childhood development as part of the evaluation. In particular, attention is paid to aspects such as the transferability of knowledge from the game environment to real-life situations, long-term effects on learning motivation, and possible socio-psychological effects. Therefore, assessing the impact of using educational games on young children suggests that while these games can be valuable tools to support children's learning and development, their benefits should be maximized with a careful information approach. Minimize time, risk and possible negative consequences. Parents, educators and game developers play an important role in creating a balanced and sustainable learning environment for children.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

Author 4: Conceptualization; Project administration; Validation.

REFERENCES

Agnafors, S. (2021). Mental health and academic performance: A study on selection and causation effects from childhood to early adulthood. *Social Psychiatry and Psychiatric Epidemiology*, *56*(5), 857–866. https://doi.org/10.1007/s00127-020-01934-5

Ahmed, S. F. (2019). Executive function and academic achievement: Longitudinal relations from early childhood to adolescence. *Journal of Educational Psychology*, *111*(3), 446–458. https://doi.org/10.1037/edu0000296

Antonova, A. (2019). Smart services for managing the design of personalized educational video games. *ACM International Conference Proceeding Series*, *Query date: 2024-01-31 13:00:38*. https://doi.org/10.1145/3351556.3351574

Ardoin, N. M. (2020). Early childhood environmental education: A systematic review of the research literature. *Educational Research Review*, *31*(Query date: 2024-02-02 11:24:40). https://doi.org/10.1016/j.edurev.2020.100353

Arslan, İ. B. (2021). Early childhood internalizing problems, externalizing problems and their co-occurrence and (mal)adaptive functioning in emerging adulthood: A 16-year follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, *56*(2), 193–206. https://doi.org/10.1007/s00127-020-01959-w

Askie, L. M. (2020). Interventions commenced by early infancy to prevent childhood obesity—The EPOCH Collaboration: An individual participant data prospective meta-analysis of four randomized controlled trials. *Pediatric Obesity*, *15*(6). https://doi.org/10.1111/ijpo.12618

Baigi, S. F. M. (2022). Evaluation Tools for Digital Educational Games: A Systematic Review. *Acta Medica Iranica*, *60*(8), 499–507. https://doi.org/10.18502/acta.v60i8.10835

Ballantyne, A. (2019). Research ethics revised: The new CIOMS guidelines and the world medical association declaration of helsinki in context. *Bioethics*, *33*(3), 310–311. https://doi.org/10.1111/bioe.12581

Bazargani, J. S. (2021). Design, implementation, and evaluation of an immersive virtual reality-based educational game for learning topology relations at schools: A case study. *Sustainability (Switzerland)*, *13*(23). https://doi.org/10.3390/su132313066

Beardsley, M. (2019). Ethics in educational technology research: Informing participants on data sharing risks. *British Journal of Educational Technology*, *50*(3), 1019–1034. https://doi.org/10.1111/bjet.12781

Belogianni, K. (2019). Rationale and Design of an Online Educational Program Using Game-Based Learning to Improve Nutrition and Physical Activity Outcomes Among University Students in the United Kingdom. *Journal of the American College of Nutrition*, *38*(1), 23–30. https://doi.org/10.1080/07315724.2018.1476929

Black, G. F. (2018). Reflections on the ethics of participatory visual methods to engage communities in global health research. *Global Bioethics*, *29*(1), 22–38. https://doi.org/10.1080/11287462.2017.1415722

Bulut, D. (2022). The effect of educational game design process on students' creativity. *Smart Learning Environments*, *9*(1). https://doi.org/10.1186/s40561-022-00188-9

Carrion, M. (2019). Serious game, gamified applications, educational software: A comparative study. *Proceedings - 2019 International Conference on Information Systems and Software Technologies, ICI2ST 2019, Query date: 2024-01-31 13:00:38*, 55–62. https://doi.org/10.1109/ICI2ST.2019.00015

Castro, M. J. (2019). Impact of educational games on academic outcomes of students in the Degree in Nursing. *PLoS ONE*, *14*(7). https://doi.org/10.1371/journal.pone.0220388

Castronovo, F. (2019). Design and development of a virtual reality educational game for architectural and construction reviews. *ASEE Annual Conference and Exposition, Conference Proceedings*, *Query date: 2024-01-31 13:00:38*. https://api.elsevier.com/content/abstract/scopus_id/85078720216

Chaudy, Y. (2019). Specification and evaluation of an assessment engine for educational games: Integrating learning analytics and providing an assessment authoring tool. *Entertainment Computing*, *30*(Query date: 2024-01-31 13:00:38). https://doi.org/10.1016/j.entcom.2019.100294

DiGirolamo, A. M. (2020). Early Childhood Nutrition and Cognitive Functioning in Childhood and Adolescence. *Food and Nutrition Bulletin*, *41*(1). https://doi.org/10.1177/0379572120907763

Oranç, C. (2019). Learning from the real and the virtual worlds: Educational use of augmented reality in early childhood. *International Journal of Child-Computer Interaction*, *21*(Query date: 2024-02-02 11:24:40), 104–111. https://doi.org/10.1016/j.ijcci.2019.06.002

Piasta, S. B. (2020). Early childhood educators' knowledge about language and literacy: Associations with practice and children's learning. *Dyslexia*, *26*(2), 137–152. https://doi.org/10.1002/dys.1612

Schachter, R. E. (2019). Guidelines for Selecting Professional Development for Early Childhood Teachers. *Early Childhood Education Journal*, *47*(4), 395–408. https://doi.org/10.1007/s10643-019-00942-8

Shonkoff, J. P. (2020). Early Childhood Adversity, Toxic Stress, and the Impacts of Racism on the Foundations of Health. *Annual Review of Public Health*, *42*(Query date: 2024-02-02 11:24:40), 115–134. https://doi.org/10.1146/annurev-publhealth-090419-101940

Vocaturo, E. (2019). Educational games for cultural heritage. *CEUR Workshop Proceedings*, *2320*(Query date: 2024-01-31 13:00:38), 96–106.

Wronowski, M. (2020). Effect of a Serious Educational Game on Academic and Affective Outcomes for Statistics Instruction. *Journal of Educational Computing Research*, *57*(8), 2053–2084. https://doi.org/10.1177/0735633118824693

Xie, J. (2021). Student, parent, and teacher perceptions towards digital educational games: How they differ and influence each other. *Knowledge Management and E-Learning*, *13*(2), 142–160. https://doi.org/10.34105/j.kmel.2021.13.008

Xiong, Z. (2022). The influence of digital educational games on preschool Children's creative thinking. *Computers and Education*, *189*(Query date: 2024-01-31 13:00:38). https://doi.org/10.1016/j.compedu.2022.104578

Yeşilbağ, S. (2020). The effect of educational computer games on students' academic achievements and attitudes towards English lesson. *Education and Information Technologies*, *25*(6), 5339–5356. https://doi.org/10.1007/s10639-020-10216-1

Yuxuan, C. (2021). Guidelines for the development of educational games to motivate the learning of theoretical concepts in Engineering and Computing courses. *Computer Applications in Engineering Education*, *29*(5), 1312–1323. https://doi.org/10.1002/cae.22387

Zahed, B. T. (2019). Play it safe: An educational cyber safety game for children in elementary school. *2019 11th International Conference on Virtual Worlds and Games for Serious Applications, VS-Games 2019 - Proceedings*, *Query date: 2024-01-31 13:00:38*, 1–1. https://doi.org/10.1109/VS-Games.2019.8864594

Zaug, P. (2022). Development of an innovative educational escape game to promote teamwork in dentistry. *European Journal of Dental Education*, *26*(1), 116–122. https://doi.org/10.1111/eje.12678

Zeng, J. (2020). To learn scientifically, effectively, and enjoyably: A review of educational games. *Human Behavior and Emerging Technologies*, *2*(2), 186–195. https://doi.org/10.1002/hbe2.188