



Development of an Educational Game Tool, "Magic Spinman," to improve the Fine Motor Skills of Early Childhood Education Students

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Article Information

Submitted December 05, 2022

Revised April 04, 2023

Accepted June 20, 2023

Keywords

Educational game;

Fine motor;

Early childhood.

Abstract

One of the things that affects learning is the teacher's strategy. Therefore, there is a need for the proper method to use educational game tools that support learning activities. From the six aspects that will be stimulated, there is an imbalance in that not many teachers provide sufficient proportion to all elements, one of them physical motor aspects (fine motor and gross motor). This research focuses on the development of educational games aimed at increasing fine motor development in early childhood through educational games, which is provided in introducing knowledge of various objects around. The method used is research and development (Research & Development) with data collection techniques through interviews, observation, and documentation. The subjects in this study were children aged 4-5 years in group A at TK Annur Semarang. The results of this study were 23 children who had practiced the educational game "Magic Spinman" properly and smoothly; from the pre-test and post-test activities, it was found that there was an increase from 17.5 to 22.4, so the average score achieved several 4.9. In addition, product trials were not only able to stimulate fine motor aspects but found several aspects of development, including aspects of religious, moral, cognitive, language, social-emotional, and artistic values in early childhood. So that the existence of "Magic Spinman" media can be useful in optimizing children's potential, being able to improve fine motor skills in early childhood, and being able to become a child's attraction and interest in learning through attractive designs.

INTRODUCTION

The teacher's strategy in teaching greatly influences learning activities, so there needs to be an appropriate method for children to receive more active and enjoyable learning, among which the characteristics can be seen from learning that combines the concept of learning while playing, child-centered, can also involve imaginative power, creativity, and curiosity, so with the existence of educational game tools it is hoped that it can support children's learning to be more innovative and creative (Boysen et al., 2022; Hijriati, 2017; Khobir, 2009; Utama et al., 2017). Based on government law no. 20 of 2003 concerning the national education system states that early childhood is children aged 0-6 (Depdiknas, 2003), where children get service facilities for growth and development (Nurcholimah, 2008) and support for children's lives according to their development (Aryani, 2015). This golden age occurs only at an early age when they are very sensitive or sensitive when receiving various

stimuli and become the basis for continuing in the next period; the rest will experience a very rapid growth and development phase and will not be repeated. (Hadisi, 2015; Marselina, 2018; Mursid, 2015). According to Pebriana in Jeni, he said that early childhood is referred to as a unique individual because the abilities of the physical, cognitive, socio-emotional, creativity, language, and communication aspects grow and develop differently according to the individual stages of each preschool-age child. Developing various potentials in a child's first year of knowing life is an important period, both physically and mentally; teaching materials must be matched to their needs, one of which is to learn through movement because movement will initiate cognitive work and can facilitate activities daily (Setyaningsih & Wahyuni, 2021; Tiasari & Ashshidiqi, 2020; Widayati et al., n.d.). Cognitive in children can develop starting from the time the child is born, which is the basis and capital in the development of every human being through the motor and sensory capacities they have; with cognitive presence, a person will be able to process his thoughts by connecting and being able to consider a value (Veronica, 2018) so that it can affect the growth of cells in the brain which makes a person have the ability to be knowledgeable (Khadijah & Amelia, 2020) starting from the stages of thinking, storing information, and adapting to the surrounding environment (Karim & Wifroh, 2014).

The ability and readiness of students to participate in the teaching and learning process are, of course, different. Differences in ability and readiness are influenced by certain factors along with the level of development, starting from preparation which includes various learning support components such as local conditions, student character, learning media, as well as the learning methods used, as well as none other than sensory maturity or sensory function in children which can also affect learning readiness (Fitri et al., 2022; Sundari, 2022; Wardani & Dewi, 2021). In learning in PAUD, several aspects of development need to be stimulated, including moral, language, cognitive, physical-motor, social-emotional, and artistic values. At this early age, children will experience a very rapid growth and development phase that will never be repeated so that the stimulation given is in accordance with the stages and the child can be raised in a good parenting and educational environment. (Mursid, 2015; Setyaningsih & Wahyuni, 2021; Widayati et al., n.d.). One aspect of early childhood development is the physical motor; in the physical aspect, the motor is divided into two types, namely gross motor and fine motor; physical motor development in children should be sufficiently stimulated, but in reality, many teachers have not been able to keep up with the implementation in stimulate from the six aspects, one of which is motor skills in children (Suarmini et al., 2022) because this aspect becomes one of the benchmarks in the next child's development (Aghnaita, 2017) and has the same role as other aspects (Fitriani, 2018).

Fine motor development is one of the essential aspects of a child's life, with this the child will quickly learn new things so that certain small muscle parts can be adequately stimulated during the development process with careful coordination, as it is crucial for educators to know fine motor skills because they affect the future development of children's behavior which can show one's maturity, besides that stimulation so that children's fine motor skills can increase it requires time in a particular process (Pura & Asnawati, 2019; Putri et al.,

2021; Sitorus, 2016). Early childhood development is the basis for further development. Therefore fine motor development in early childhood needs to be developed and trained; if there are obstacles in the child, it can be followed up immediately (Fitriani, 2018) so that the function of the small tissue muscles can be well coordinated (Tiasari & Ashshidiqi, 2020) and remain interrelated with other aspects of development, including being able to support aspects of cognitive, social-emotional, and language development, because in essence each development is mutually sustainable and cannot be separated. (Sumantri, 2005). One of the things that show that someone has intelligence can be seen in their vocabulary skills so that they can be used as provisions in language; language development is also important in human life to interact with each other (Ita et al., 2020). In addition, fine motor development can also be influenced by several causal factors, including the child's willingness to learn, children's opportunities to learn, practice opportunities, good learning models, motivational guidance, and, most importantly, actions taken by each individual (Oktarina et al., 2020).

Providing learning activities for early childhood can be done through play, which is a means for children to express their activeness to achieve pleasure from the activities carried out (Pratiwi, 2017); play activities can affect arousing motor and sensory nerves in children (Hasan, 2013), children's activities throughout their days are passed by playing activities because children's life is with games (Yuliani Nurani, 2012). In carrying out activities, the teacher provides educational game tools as learning media for children, which can influence the development of creative thinking in children, as well as digital educational games. (Xiong et al., 2022) Games can be entertainment and development of teaching materials that can help facilitate the teaching process in early childhood (Rodrigues et al., 2022), according to Zainal in Rahma's research revealed that educational game tools are something that can be used as a means and tool for children to play and learn because there are elements that educate and can develop various aspects and abilities in early childhood, whereas according to Syamsuardi said that educational games are Forms of games created to provide learning experiences for children, including traditional or modern types of games, can be given educational content as teaching (Rahma, 2017), besides that at the golden age from 0-6 years is a very rapid phase for children in the process of growth and development, so with educational games it can also provide stimulation and response to the function of the five senses, in which there are balanced elements so that they can affect the body, reasoning power, imagination, disposition and character, until adulthood, because this will form into a person's character and later as a way to determine the direction of his life's journey (Mujib & Rahmawati, 2013), according to Nursalam in Mirna who said games can function to optimize children's development according to the stages of age and development in achieving only the six aspects of development, different things according to Harlisa's view, it is better in giving games parents must know the purpose of these games in order to improve children's development in further stages (Lisa et al., 2020).

Learning at An-Nur Kindergarten Semarang does not yet have educational games that support the development of fine motor aspects because there are only learning activities such as cutting, pasting, and collaging. On this occasion, researchers need to create and develop the game "Magic Spinman" to educate and assist in developing fine motoric aspects of early

childhood. Because in this game, you can coordinate your eyes, hands, and small muscles. Aspects of fine motor development have various elements of physical fitness in the form of strength, endurance, speed, agility, flexibility, coordination, accuracy, and continuity. So with the skills children can achieve through playing activities, children become happy and comfortable, so the educational game can be a way to stimulate children's fine motor skills. (Suryana, 2018), This aspect needs to be developed because the better the child's motor skills will make the child more creative (Indraswari, 2012) and innovative in learning (Hijriati, 2017). Previous studies have explained the correlation between the use of educational games and children's motor development (Utama et al., 2017) and only identified that the use of educational games through natural materials can be used to stimulate fine motor aspects in children (Astini & Dkk, 2017) and the use of educational game has an impact on children's ability to train their fine motor skills (Mukhtar, 2018), There are also results showing the influence of the use of educational game through block, dance, drawing, and cutting activities (Lisa et al., 2020). In this study, it is the same as, focusing on fine motor skills in early childhood, but what distinguishes it from previous research is that this research is complementary, namely from the concept of making an educational game and its development to product trials that can influence the improvement of fine motor development results in children. The educational game "Magic Spinman" can attract and interest children in learning through an attractive design so that it can optimize learning more effectively through educational, creative, and child-friendly designs.

METHODS

This research uses the development method (Research & Development), which is related to research methods to produce a particular product and improve it so that the product is more effective in its use (Saputro, 2011). This method aims to formulate and test theory but can also develop more effective results for institutions (Assingkily, 2018). Researchers use learning media with the ADDIE development model, which is the main basis in several stages, including (1) analysis, namely to analyze needs in an effective learning process, (2) design is to determine models, methods, or teaching materials that are suitable for use (3) development is producing media or teaching materials (4) implementation is carrying out or testing the product (5) evaluation is assessing the implementation of the source of the media or teaching materials used. The ADDIE model is an approach model that explains an analysis of each component's various components and relates to one another according to what is needed. (Rayanto & Sugianti, 2020).

The research was conducted at Annur Semarang Kindergarten, located on Jl. Tugurejo Site, Tugu District, Tugurejo Village, Semarang. This product trial involved group A students aged 4-5 at Annur Kindergarten Semarang, with 23 children carried out on November 12-19, 2022. The development procedure was carried out through the stages of preliminary study, prototype development, and field testing. Data collection techniques were collected through observation to find data about children's behavior while playing the game. Interviews were conducted through questions and answers to children regarding the games used. Documentation is done to describe unique behaviors and events that occur when children play

games. Several stages of analysis were carried out through quantitative description. Data or results obtained from responses from material experts and media experts on assessing the quality of products developed and reviewed from existing aspects. Furthermore, the validation results obtained are criticism and suggestions that will be added in the revision. Data analysis in this study was then carried out by combining descriptive qualitative and quantitative data. Qualitative data were obtained from material validation and media experts, while quantitative data was obtained from the results of field trials so that it can be used as a basic source for developing the educational game "Spinman Magic" product.

RESULTS AND DISCUSSION

The process of developing an educational game tool, "Magic Spinman," Through the use of educational game tools in children's play activities, has supported learning in Annur Semarang Kindergarten; the selection of game tools has been adjusted to the age and level of development for children. The "Magic Spinman" game, according to the level of achievement of development and characteristics of children aged 4-5 years, so that the use of educational game can already be practiced to support the learning process that focuses on achieving fine motor skills in early childhood; this is one of the components that need to be considered in preparing children's learning activities as a support, namely by the existence of learning media in the form of the educational game (Sundari, 2022). Researchers have made the game "Magic Spinman" in the form of the Doraemon character, which is very attractive and attractive to children, and the enthusiasm of the children is very high when the game is brought to be introduced; this makes one of the principles used to package children's learning carried out through playing according to the needs of the child so that it can cause feelings of pleasure and finally awaken cells in the sensory-motor nerves in children (Hasan, 2013). Researchers made this game in the form of a spin that can be played; in the spin, there are several learning themes, including fruits, vegetables, plants, celestial bodies, and animals. Children who have spun spin and played it have a high sense of joy and enthusiasm.

The "Magic Spinman" game is an educational game made of Doraemon-shaped cardboard, which contains a more spin game according to the learning theme, and there are bottle caps with stickers based on the theme and color classification. This educational game has been used by children aged 4-5 years. The tools and materials needed in making the educational game "Magic Spinman" are cardboard packing size 50 x 30 cm, 25 pcs drinking water bottles, 50 x 30 cm cardboard board, one spinner, bells, red ribbon, stickers with pictures according to the theme, rope, flannel, scissors/cutter, and glue.

The steps for making an educational game tool, "Magic Spinman," namely: (1) Prepare tools and materials; (2) Design the educational game draft on hvs paper; (3) Start sketching on the cardboard board, then sheducational game it into a Doraemon sheducational game by cutting according to the sketch; (4) affixed with flannel cloth; (5) Cut a round cardboard board to make a spiner; (6) Attach the cut end of the bottle as a place for the cap with the sticker; (7) Start sticking the flannel according to the sketch; (8) Installing spinners, bells, and red ribbons as necklaces for accessories; (9) Attach flannel cloth to cover the edge of the lid; (10) Paste the flannel cloth on the more spin, then paste the writing according to the theme and attach the

sticker to the bottle cap; (11) Put the finished "Magic Spinman" design into the packing box tied with a string; (12) Lastly, attach the SOP sticker, accessory icon sticker, and educational game is ready to be tested.



Figure 1. Manufacturing Process and Educational Game "Magic Spinman"

Source: Personal Documentation

In the process of making this educational game starting on September 12, 2022, then in the early stages when the design process has been validated so that it can be continued into the actual form of APE. During the manufacturing process, several materials had to be replaced because they were required to comply with the standard criteria for making educational games for early childhood, including changing the material from paint to flannel which felt safe for children. The wire originally used to attach the design to cardboard was changed to the rope to make it safer. For the rest of the manufacturing process, no obstacles become obstacles in completing this project. Everything went well, smoothly, and as expected. In the final stage, it went through a periodic validation process; then, on October 31, 2022, the educational game was completed and successfully validated by a design expert, namely Ms. Rista Sundari as the lecturer in charge of the educational game design development course in the Early Childhood Islamic Education study program, Walisongo State Islamic University Semarang. Then the material and media validation process was carried out on December 5, 2022. Material validation was carried out by Ms. Naila Fikrina Afrih Lia, revealing that the product is good. Still, it is good that the product can be developed in the aspect of moral and religious values in the form of an introduction to the creation of Allah and humans through the types of themes provided, so the material validation assessment was considered excellent. Then the game rules can be added by reading Basmallah and

Hamdallah. The last validation was carried out by Mr. Sofa Muthohar, who assessed the media; on the media used, there was a comment stating that "it is better for the product to be used standing up and to add decoration to the front cover using flannel to make it more attractive, besides that it is better to place the bottle cap in space which is looser with other forms of arrangement, the rest are in the very good category.

The results of the media validation show that there are differences in the bag as a place for the bottle cap, which cannot be aligned, but the placement is adjusted to the pocket space. Then in the selection of wire materials, it was replaced with rope to make it safer for children; in the selection of materials that previously used watercolor, which was then replaced with flannel.

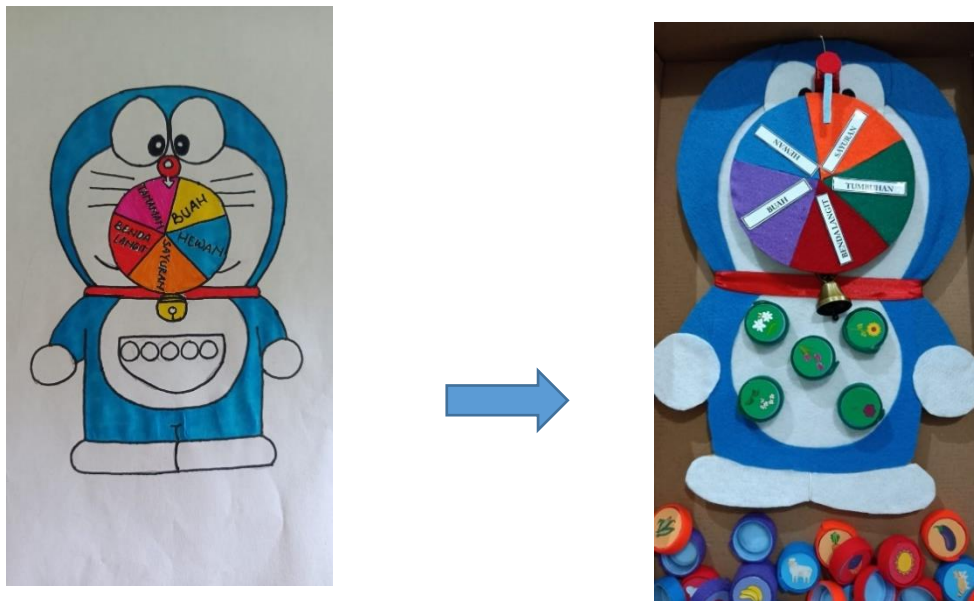


Figure 2. Product Design Improvement Changes
Source: Personal Documentation

Assessment by Material Experts

$$\text{Validity presentation} = \frac{\text{Observed score}}{\text{expected score}} \times 100\%$$

$$= \frac{59 \times 100}{60} = 98.3$$

Based on the data obtained from the research, the material expert stated that the total rating score obtained was 59 out of the expected 60; after being converted into percentages, the result was 98.3% in the "excellent" category. So, the percentages made by material experts can be a useful input in developing ideas for the products that have been produced.

Assessment by Media Experts

$$\begin{aligned}\text{Validity presentation} &= \frac{\text{Observed score}}{\text{Expected score}} \times 100\% \\ &= \frac{65 \times 100}{75} \\ &= 86,6\end{aligned}$$

The data from the media expert's assessment revealed that the total rating score obtained was 65 out of the expected 75; after being converted into percentages, the result was 86.6% in the "excellent" category. Based on the assessment by experts with the input and comments given, it can realize the development of products that can later be produced for the better. The data from the media expert's assessment revealed that the total rating score obtained was 65 out of the expected 75; after being converted into percentages, the result was 86.6% in the "very good" category. Based on the assessment by experts with the input and comments given, it can realize the development of products that can later be produced for the better.

Improving Children's Fine Motor by Using "Magic Spinman." This game has been tested involving 23 group A children at Annur Kindergarten Semarang who have successfully practiced the educational game "Magic Spinman," the activity went well and smoothly; the children used the educational game according to the purpose of making an educational game and were able to stimulate several aspects of development including aspects of physical motor, cognitive, language, social-emotional, and moral, religious values in early childhood. In the physical motor aspect, it has been able to train fine motor skills in early childhood; the cognitive aspect can also train children in symbolic thinking through a variety of colors and their classifications, introduce knowledge about various objects around through educational game media that is played, language aspects train aspects of language when the child makes observations and when attaching the sticker caps with pictures according to the theme. In its implementation, when learning starts with class conditioning by singing, and there is an agreement on rules that make the class more conducive, with PAUD management in these activities, the class situation can be managed properly and effectively (Ita, 2018) so that it is more conditioned before in the end moving on to core activities. After that, it was followed by an introduction to an educational game, which was explained by one of the researchers who acted as a teacher to be able to explain the instructions for using the educational game (Ita, 2018) so that it is more conditioned before finally moving on to core activities. After that, it was followed by an introduction to an educational game, which was explained by one of the researchers who acted as a teacher to be able to explain the instructions for using the educational game.



Figure 3. Introduction of Educational Game SOP
Source: Personal Documentation

Then the children can easily be arranged to sit in a row and grouped when playing the educational game "Magic Spinman," which is done alternately.



Figure 4. Sitting in a Row
Source: Personal Documentation

One teacher accompanies the children in the main activities, and the other is in charge of documentation. When the play activities begin, the children are very interested and delighted; some even want to repeat it. The children took turns being able to play the game with a cheerful face, on average the children were able to play well according to the instructions; there was even one child who had achieved an assessment (BSH) that developed as expected in the aspect of moral, religious values in because he had to Say havdalah after playing.



Figure 5. Playing "Magic Spinman"
Source: Personal Documentation

When everything was done, arriving at the closing activity for recalling, the children were very happy, and many of them succeeded in mentioning various things in the appropriate theme; even one of the children knew that the themes presented were all creations of Allah SWT.

Table 1. Average Score Improvement of the Pre-Test and Post-Test

Product	Pre-Test	Post-Test	Average Improvement	Range
Media Development "Magic Spinman"	17,5	22,4	4,9	1-28

Based on the table above, there are significant differences in fine motor skills in children aged 4-5 years playing "Magic Spinman." In the pre-test activity, an average score of 17.5 was obtained out of 404. Meanwhile, in the post-test activity using developed media, an average value of 22.4 out of 516 was obtained. From the pre-test and post-, the test experienced an increase in the average value of 4.9. So that with the Magic Spinman media, children's ability in fine motor skills can increase.

There are several advantages and disadvantages of the "Magic Spinman." The advantages of the Magic Spinman media include the following:

First, this magic spin man media can stimulate the six aspects of development in early childhood, which include: (a) religious and moral values because the children can be grateful for God's blessings through themes on stickers with pictures; (b) physical motor to training children's fine motor when installing the lid; (c) social-emotional to practice patience when playing it; (d) cognitive to know the types of themes through color grouping; (e) language to name the sticker with the picture on the bottle cap; (f) Art to ring the bell at the start and end of the game. Second, Magic Spinman media is easy to carry and play anywhere. Third, the character design of the game "Magic Spinman" can attract children's attention because there is a Doraemon cartoon character. However, in using the media "Magic Spinman," there are

some drawbacks: (1) the Magic Spinman can only be played in the sleeping position; (2) it cannot be removed or moved from its storage area; (3) the product durability still needs attention.

CONCLUSIONS

Based on the trials conducted in this study involved twenty-three students at Annur Kindergarten, Semarang. The study's first finding on the "Magic Spinman" educational game tool is an assessment carried out by material experts with as many as twelve indicators which are the criteria for developing the product. The percentage validity results from the formulation of the score that has been observed divided by the expected score and multiplied by one hundred percent so that the result is ninety-eight point three percent concerning the "very good" category. Then it is continued by the media expert's assessment with fifteen indicators through the score formula that has been observed divided by the expected score and multiplied by one hundred percent to obtain a result of eighty-six point six percent in the "very good" category. The second finding regarding the increase in fine motor skills of children with the educational game "Magic Spinman" in the data listed states that the average increase in the Pre-test is seventeen point five from a value of four hundred four, and the Post-test is twenty-two point four of the five hundred and sixteen figure value. From the pre-test and post-test activities, there has been an increase in the average value of four point nine. The importance of educational game tools that are made attractive, safe, and according to developmental stages is useful in optimizing potential in early childhood, supported by product trials and development. So, the "Magic Spinman" media developed can improve fine motor skills in early childhood and attract children to support an effective learning process.

ACKNOWLEDGMENT

The author would like to thank the teachers and principals of Annur Semarang Kindergarten who have participated, as well as friends who have contributed and supported in making this article. Furthermore, Mr. and Mrs. lecturers have guided us in writing this article. This paper still has many shortcomings and improvements; please give constructive criticism and suggestions to improve it in the future. Hopefully, in the future, this article can be helpful for all of us and can be a reference in other research.

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