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Development Color Game to Stimulate Science Literacy in Preschool

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Abstract

Science for child age early can give experience positive for child Which help himself For develop understanding about something draft science, develop ability thinking The aim of this research is to develop children's scientific literacy through color games. Based on the results of interviews and observations (2023) in Kindergarten in group B (aged 5-6 years) in Bukittinggi City shows that children's scientific literacy low, this can be seen from: 1) 78.50% It is difficult for children to understand science concepts when studying from home. This can be seen when they are not yet able to recognize the basic colors (Red, Blue and Yellow). 2) 88.35% of children have not been able to find new colors when conducting experiments mixing color. 3) 79.67% Child Not yet capable classify object based on color, form And size. 4) 88.65% Children Not yet capable tell the results mixing color Which they chosen. 5) 87% Teacher Not yet capable designing Games education in accordance with need child, so that child more interested use games Which There is. Testing the effectiveness of the Sipak Batu game was carried out using the one group pretest-posttest experimental method. The respondents in this study were 15 children. The results of data analysis showed that there was an increase in the average before being given treatment, namely 34.73 compared to after being given treatment, namely 40.40. From the calculated t of -10.159 with a probability/significance level of 0.000 (p value < 0.05), this means that H₀ is rejected because there is a significant change between before using the color game (pretest) and after using the color game (pretest) Color game (posttest).). So it can be concluded that color games are effectively used to develop scientific literacy in children aged 5-6 years.

Keywords: Color Game; Literacy Science; Child Age Early

Introduction

Science for child age early can give experience positive for child which help himself for develop understanding about something draft science, develop ability think ^[1-3]. Based on the results of interviews and observations (2022) in Kindergarten ingroup B (aged 5-6 years) in Bukittinggi City shows that scientific literacy low level children, this can be seen from: 1) 78.50% The difficulty of children understanding concepts science when studying from home. This can be seen when they are not yet able to recognize basic colors (Red, Blue and Yellow). 2) 88.35% of children have not been able to find it new colors when doing color mixing experiments. 3) 79.67% of children have not yet able to classify objects based on color, shape and size. 4) 88.65% Children are not yet able to tell the results of mixing colors which they selected. 5) 87% Teacher yet capable designing Games education in accordance with needs child, so that children are more interested in using existing games. The consequences felt when Children's scientific literacy is low so efforts are needed to improve children's science abilities at an early age can stimulated with optimal.

Overcome problem the, so need developed media which makes it easier for children to understand science concepts. This media is an electronic magazine which can utilized when they carry out BDR (Study from House) making it easier to understand scientific concepts. Gamico (Mix Color Game) is an educational game that can be accessed on a gadget or Android via the platform EXE, SWF, HTML Which designed through application Adobe Flash Professional CS6 ^[4]. This application is a flash design tool that can be used to create animations and gaming applications. There is an interesting part in this media, namely: this game stimulating science child through activity introduction color, mixing color, know form as well as grouping object in accordance color as well as designed in accordance with theme learning preschool, in accordance with method learning science that is experiment, can accessed use Android. From the data above it can be understood that Gamico (Game Mix Color) is based can have a positive impact. There is Gamico Development (Game Mix Color) will be able to help teachers and parents to develop scientific literacy in early childhood. Paying attention to the problems that have been raised, the researcher interested do study development with title "Development Gamico (Games Mix Colour) Based Android For Stimulation Literacy Science Child Age Early"

Objective Study

- To find out about the development of Gamico (Game Mix Color) based on Android For Stimulation Literacy Science Child Age Early (Validation, Prototype, Test Try Product).
- For now Implementation Gamico (Games Mix Colour) Based Android For Stimulation Literacy Science Child Age Early.
- To find out the evaluation of Gamico (Game Mix Color) based on Android Stimulation Literacy Science Child Age Early.

Urgency Study

Importance held study This Because Literacy science very important For developed for early childhood. Scientific Literacy is a skill and ability think as well as process information, so that can find many kinds of alternative problem solving. If scientific literacy does not develop optimally, so child age early No capable solve problem And think critical ^[1-3]. Incapacitated child solve a problem then they will not be able to face the challenges in future. This research can develop scientific literacy, though With the current situation, children find it difficult to understand science concepts when BDR (Learning From House). There is Development Gamico (Games Mix Colour) will can help Teacher And person old For Can develop Literacy science on child early age.

State of the Art

Development research or Research and Development is research which aims to develop and produce a product valid For answer the problems that form the basis of development. Research and Development is a research method used to produce certain products and test its effectiveness (5). Study development in field education (in study development innovation learning). Study development bye something method study Which load 3 component main, namely: Development Model, Development Procedure, and Model Testing (6). Product method study Which produce A product

in field skill certain, Which followed product side certain as well as own effectiveness from A product the ^[7]. Based on opinion expert the, can concluded that study development is A method study Which used For develop A product through stages certain, until later generated A product Which tested level validity, practicality, And its effectiveness to need. The goal of R&D in education is not to formulate or test theories but is to develop effective products for use in school. Study development based on two objective namely: Development product prototype, Formulation of methodological suggestions for design and evaluation prototype product mentioned ^[8]. Based on opinion the can concluded that objective study development is produce something product with notice demands certain, so that the products produced are in accordance with needs and provide innovationsu For increase quality product Which Already There is. Media learning is is tool Which can help process learn how to teach so that meaning message Which be delivered become more clear And objective education or learning can achieved with effective And efficient. Media Learning functions as a source of learning for students to obtain messages and information provided by the teacher so that the learning material can be more increase And form knowledge for students (9). Educational games are a very interesting medium to develop. One The main advantage of educational games is the visualization of real problems. Games education is superior in several aspects when compared to learning methods conventional. One of the significant advantages is that it can be animated improve memory so that children can retain learning material in time which takes longer compared to conventional teaching methods ^[10]. Added by research conducted by Badruzzaman Game education proven more efficient compared to with method learning conventionally passive for children, educational games have real problems packaged in creative visuals to trigger logic and influence behavior children's positive learning ^[11]. Based on study in on state games education very efficient used on world education. This game increases knowledge in certain subjects and the most popular are math games ^[12]. Report about consumption child age early game digital very interesting, with studies such as the Pew Internet & American Life Project showing 99% of children boys and 94% of girls play digital games ^[13]. Design games education very facilitate learning in matter develop cognitive, behavioral, affective and socio-cultural involvement. Game Colors for early childhood are an activity that is very suitable for use in development cognitive. In learning mix color requires atmosphere which is fun and the media has been well planned in use in the classroom. Started introduction color primary until color tertiary ^[14]. Based on results study previous state that Games Mix Color is an educational game media that can make things easier for participants students in carrying out the learning process. However, there has been no related research use Games Mix Colour to literacy science on child age early Which where is the media? This designed in accordance with characteristics age child Park Children group B (Age 5-6). Difference GAMICO (Games Mix Colour) with games Previously, this game could be accessed on a device or Android via platform EXE, SWF, HTML Which in design through application Adobe Flash Professional CS6. This application is a flash design tool that can be used to create animations and applications games. There are parts what's interesting about this medium namely: this game is stimulating children's science through color recognition activities, mixing colors,

recognizing shapes as well as grouping object in accordance color as well as designed in accordance with theme learning preschool, in accordance with method learning science that is experiment, can accessed use Android. Literacy ability is a fundamental thing that participants must have educate in face era global For can fulfil need life in various situation. Literacy science is ability For understand science, communicate science, as well as apply ability science For solve problem^[15]. Ability science beginning is ability Which relate with various test or with method certain To use in approach in a way logical And still consider the child's stages of thinking^[16-17]. Science learning, including the introduction of natural concepts for children is something effort help child For find draft And process certain in life, in other words science learning for children is essentially made as media Which used For stimulating aspect development And maximizing potency Which There is in self child.^[18] Science can encourage children to think critically, because with science children don't do that just accept or reject something. Children observe, analyze and evaluate information Which There is before determine his decision^[19]. Ability science beginning is ability Which relate with various test or with method certain To use in approach in a way logical and still consider stages think child. For increase Early childhood science abilities require stimulation so that children can do it activities as stated planned by teacher^[20]. Through test science through Skills process, children can be improved

Stages Study



Fig 1: Models ADDIE Development

- According to product development steps, research and development model this more rational. Model ADDIE developed by Dick and Carry (1996) for designing learning systems. The following given examples of activities at each stage media, that is:
- Analysis** At this stage, the main activity is to analyze the need for media development and analyze appropriateness and terms development media. Do analysis need, analysis objective development?
- Design** On stages This designing Theme Learning (theme Which will used: Needs), RPPH learning tools, Designing Prototypes, designing Games Mix Colour, Create Back Sound games.
- Development** In the development stage, the conceptual framework is realized become product (games Mix Colour) Which Ready implemented.
- Implementation** At this stage, the design and methods are implemented has been developed in situation which real that is in the classroom B Park child City Bukittinggi. Material be delivered in accordance with media new

which developed.

- f. Evaluation started with determination criteria success, as well as analysis results.

Results and Discussion

In developing scientific literacy skills in children aged 5-6 years, children need Game Based Learning, which is a learning method that uses game applications or games that have been specifically designed to assist the learning process and help increase student effectiveness in learning. According to Alamsyah *et al.* the game approach to learning is able to stimulate children's language, emotional, intellectual and psychomotor skills. Game-based learning can learn a concept from a problem and train focus on the problem. Therefore, game-based learning can be an attractive solution for children. Children need to develop learning game content using multimedia elements, including text, images, sound and animation. This is to produce interesting and fun games for children. By using color games to develop children's scientific literacy skills. According to Koivisto the development of digital Game Based Learning applications for early childhood is seen as very strategic and potential because it is a very productive golden age. To develop children's scientific literacy skills, they need learning motivation. Learning material presented in the form of games can foster children's interest and motivation to learn. According to Klock *et al.* digital games are generally presented in the form of interactive animation and equipped with various features, such as sound effects and instant feedback from characters, so that children do not realize that they are learning. Therefore the game is designed based on the principle that encourages players to continue repeating the game until the game goal can be achieved. Continuous repetition while playing can help form strong memories in the child's brain, so that the understanding of the concepts acquired by the child while playing can last longer in the child's memory. The development of color games is in accordance with the concept of playful learning because activities to develop scientific literacy in children are carried out through game media. The learning given to early childhood uses the Playful Learning method, namely fun activities through games. This is also in line with research from Gelisli & Yazici, which states that games are very necessary for young children to maximize their learning process. Color games are adapted to the daily play activities of children 5-6 years old.

Based on several findings in this research, color games do not only develop one scientific discipline but also multi-disciplinary which can be described as follows:

- The social science discipline in this research is seen when children wait while their friends play. This is in line with Vygotsky's theory which states that to help children optimize their development, children must be involved in social interactions with their peers. Morrison.
- Religious discipline is also visible when children say greetings, read prayers before and after studying. Children learn this through color game activities. This research from a language discipline perspective occurs when learning the mother tongue, namely vocabulary, asking questions, expressing ideas and understanding command words. This is in accordance with Chomsky's learning theory where children's language contains language acquisition abilities including vocabulary, grammar, to express thoughts Dardjowidjojo.

- In terms of artistic discipline, it can be seen from the children's activities in watching videos and listening to songs on Gamewarna. This is supported by Irshad *et al.* Art can develop children's intelligence, language skills, coordination abilities and develop children's imagination. Here children use color game applications to display videos and songs.

Conclusions

The use of color games is carried out with the aim of providing a new breakthrough in helping children aged 5-6 years to develop scientific literacy skills. The situation that occurs in the field illustrates that children are experiencing problems in scientific literacy. This is due to a lack of knowledge and ability of teachers in creating creative, innovative and interesting media for children. The use of color games is appropriate, meaning the learning media used is in accordance with basic competencies, effective, meaning the learning media used is able to increase student motivation, c) varied, meaning the learning media used is able to encourage students' active attitudes in Study.

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