

TRAIN CHILDREN'S ABILITY TO SOLVE PROBLEMS INTO MATHEMATIC THROUGH MONSTERMATH ANIMATIONS

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Abstrak

Beberapa permasalahan dalam pembelajaran matematika seperti kurangnya minat siswa dalam belajar menggunakan media yang hanya tampak secara visual, banyak dari mereka yang tidak mampu menyerap pelajaran dengan baik ketika diajar menggunakan media visual, cukup berbahaya bagi anak tunagrahita, karena media tersebut media pembelajaran yang digunakan terbuat dari kayu, serta pengadaan media animasi/kartun dalam jumlah terbatas yang sesuai dengan tahapan perkembangan anak tunagrahita. Berdasarkan hal tersebut, penulis melakukan kegiatan optimalisasi penggunaan media pembelajaran animasi 3D pada mata pelajaran matematika bagi guru berupa kegiatan pelatihan dan pendampingan. Hasil penelitian menunjukkan bahwa kecerdasan logika matematis anak sedang berkembang. Mengembangkan kecerdasan logika matematis anak dapat dikembangkan melalui media animasi dalam lagu anak yang dirancang sesuai dengan tema pembelajaran AUD. Penggunaan media animasi dalam lagu dapat menarik minat anak dalam menggunakan imajinasinya sehingga mampu mengungkapkan ide. Media animasi berbasis tematik merupakan kegiatan yang menyenangkan bagi anak usia dini.

Abstract

Some problems in learning mathematics such as students' lack of interest in learning to use media that only appear visually, many of them are not able to absorb lessons properly when taught using visual media, quite dangerous for children with mental retardation, because the media the learning media used are made of wood, as well as the limited number of animated/cartoon media procurement that is in accordance with the developmental stages of children with mental retardation. Based on this, the authors carry out activities to optimize the use of 3D animation learning media in mathematics for teachers in the form of training and mentoring activities. The results show that children's mathematical logic intelligence is developing. Developing children's mathematical logical intelligence can be developed through animation media in children's songs designed according to the theme of AUD learning. The use of animation media in songs can attract children's interest in using their imagination so that they are able to express ideas. Thematic-based animation media is a fun activity for young children.

INTRODUCTION

Education is a universal activity in human life. The essence of education is a human effort to humanize humans themselves, namely to civilize humans. In general, education is a conscious effort to shape a child's personality to become an independent adult, because education aims for children to become adults, independent and changes in knowledge, behavior and attitudes occur. Besides education applies to anyone, education also takes place for life (life long education), a phrase that is often known from ancient times until now which means "lifelong education".

Mathematics is an exact science, which studies the calculation of numbers. Mathematics is the foundation of other sciences, so mathematics is often referred to as the mother of science (Hartariani, Putu, Damayanthi, Wirawan, & Sunarya, 2016). By mastering mathematics, a student will be able to easily master other exact subject matter. In addition, students who master mathematics will have better reasoning, be able to communicate well, and be able to solve problems effectively and efficiently.

The ability to solve problems is very important in learning mathematics. This was also emphasized in the demonstration by Hadi and Radiyatul that the general objective of teaching mathematics is the ability to solve problems. This ability cannot be directly owned by an individual but must be learned and trained so that this ability can develop, to train it, namely through learning mathematics. In learning mathematics students are not taught just to know the final result, but students must be taught to be able to know the process and be able to explain the methods or steps taken to find answers.

In learning mathematics, teachers usually use thematic methods, assisted by several visual media, such as objects in the form of triangles, rectangles, circles, puzzle boards, books, and pictures. The use of this media is based on the stages of cognitive development of children with mental retardation, in which they are in concrete and semi-concrete stages. But in reality in the field, the use of these media when learning mathematics is not fully effective and even quite dangerous. This happens, because you can't focus, you're bored, and you easily switch attention. Students sometimes need a media that can not only be seen, but can be heard, and has movement, such as animated/cartoon videos (Risti & Ibrahim, 2011).

Seeing conditions like this, it is necessary to have an alternative media that can help overcome these conditions. The use of 3D animation media in the process of learning mathematics can be the right solution for student problems. This opinion has been proven, during the trial implementation in the early stages of its development, where students with mental retardation looked so enthusiastic and happy when they were taught using the 3D animation learning media. This condition is certainly different when they are taught using media that only appears visually, without sound or movement as in 3D animation learning media (Pradnyana, 2015).

In addition, the use of 3D animation-based learning media in the mathematics learning process can increase students' understanding of the material being taught, because the 3D animation learning media that has been developed has several

advantages, such as 1) the content of the material in 3D animation learning media has been adapted to the demands of the curriculum (syllabus), 2) organizing the material in clear and structured media, 3) the duration of the pronunciation of the material in the video is not too fast, in this case the use of duration in the media has been adapted to the needs of children with mental retardation, through trial activities during the development stage, 4) using Indonesian as an introduction, with sentences that are very simple but clear so that students can easily understand them, and 5) using examples, such as objects and other characters in varied forms coupled with coloring and an attractive appearance.

With this 3D animation learning media, it is hoped that it can help and facilitate teachers in teaching students with mental retardation, in learning mathematics, so that it can increase the productivity of learning at school, which in the end students with mental retardation are expected to have better reasoning, so what is the goal of mental retardation education, namely being able to live independently, at least being able to take care of themselves in a simple way (giving signs or simple words when they want something like eating, drinking, etc.) can be realized.

METHOD RESEARCH

For this paper, the method of sterilization in its nature qualitative data will be analyzed qualitatively using secondary data as well as primary data (Gunawan, 2013). The selection of qualitative methods is based on the objectives of qualitative sterilization, namely to understand the phenomenon of what is experienced by the subject of sterilization, for example, behavior, perceptions, motivations, actions, etc. both holistically and descriptively in the form of words and language, in a natural contexts and by utilizing various scientific methods (Meolong, 2012).

Data created by the monster for the specific purpose of solving an ongoing problem. Primary data sources were obtained from interviews and observations with key informants. In this surveillance, the sources of secondary data are literature, articles, journals, the internet, and previous surveillance which are in line with this surveillance. The process of data collection is the process of collecting various things that will be used as material for sterilization. In this monitoring, monitoring collects data from several ways, namely direct observation, literature review, and documentation.

RESULTS AND DISCUSSION

Result Of Research

Content Analysis

The animated film *Monster math* itself has not yet been broadcast in any media, because it is still in the production stage. So that adjustments can still be made by related parties, namely the creative team for the *Monster math* animated film. With the current conditions, it is better for the *Monster math* animated film to use the Product Specialization method, where Ayena Studio focuses on products or services that will be marketed to various market segments.

By setting elementary school students, junior high school students, and high school students as the target market with a note of making slight adjustments in the process of making the Monster math animated film. The consideration for taking the target market is due to the suitability of the Monster math animated film with the interests of elementary, middle and high school students covering the comedy genre, and using Indonesian. Because these two things will take a long time if changes are to be made. It's different from just adding stupidity and cuteness in both the main character and by adding supporting characters.

Apart from that, it happens that this Monster math animated film tells about everyday life and also contains learning values and norms that are in accordance with the potential target market of the Monster math animated film. Because the Monster math animated film itself hasn't been shown yet, adjustments can still be made to media issues and broadcast times. So elementary, junior high and high school students will be set as the target market for the animated film Monster math.

In order to position elementary, middle and high school students, the animated film Monster Math must have a number of advantages compared to local animated films which have already been shown on television. As for the efforts that can be made by the Monster math creative team. First, regarding the broadcast time for the animated film Monster math, try to broadcast it every day on television with showtimes from 14.00 to 14.00 hrs. 15.30 WIB from Monday to Friday and on Saturdays and Sundays from 18.30 s.d. 20.00 WIB.

Because that way the Monster math animated film can reach elementary students from Monday to Friday and on Saturdays and Sundays the Monster math animated film can be watched by all of the predetermined target markets including elementary, middle and high school students. Second, adding a supporting character in the form of a girl with adorable cute traits and this character is given a big role in each episode.

Movie dialogue

The following is a player and dialogue with a cloud bread film image based on (Nurgiyantoro, 2017: 166). In characterization, character or character traits can be seen through character dialogue, character explanations, and physical depictions. The behavior of the characters can be regulated through actions, speech, habits, and so on.

Episode Opening Cans

The opening song has a core that tells of an elderly woman (monster) named Monster who has the courage and virtue to help others. In this episode of opening the can, it has a duration of 5 minutes 55 seconds which starts with the background in the Monster's house, in the kitchen to be precise.

During the hot day, the Monster complained that it was hot and hot. The Monster also tried to drink water in a cylindrical cup without a lid. But he realized that the gallon water supply at his house was running out. Then he remembered that there was a supply of food and drink in cans that he kept in the refrigerator. Without thinking he immediately opened the refrigerator and took the can. He was looking for a way to

open the very hard can lid. He used several tools including pliers, knife, screwdriver, hammer and saw but his attempt to open the can failed so he had to think about it another way to open it.

Then he got an idea by using a heavy and large ax to open the can. He then took the can out of the house and started trying to open it with an ax that was resting on a tree. However, the can bounced into his chicken coop when he started swinging his axe. He also intended to take the can that slipped under his pet rooster which seemed fierce. Unknowingly the Monster is being chased by the chicken when he tries to reclaim the can.

He was chased by the chicken until he was cornered in a cottage where he lived, the chicken kept running towards the Monster while jumping and was about to stab the Monster with its sharp beak. Unknowingly, Monster protected his face with both hands while holding the can until the chicken jumped and pecked right at the top of the can. The monster and the chicken were both shocked and the chicken's beak got stuck in the Monster's can, causing the can to open when the Monster tried to get away. Finally Monster happily managed to open the can and immediately ran into the house for fear of being chased again by his chicken.



Figure 4.1 Episode footage of opening a can

The episode above illustrates several geometric shapes including the glass used by Monster when he wants to take a gallon of water. The geometry of the glass is a cylinder without a lid with a circular base. Another interpretation is the shape of the can in the form of a cylinder with both sides closed in a circular shape.

From this interpretation, it can be concluded that if students are able to analyze the geometric shapes of cans and glasses which are the core objects of the Monster Math episode, the analysis can be in a 2-dimensional form, namely redrawing objects and calculating formulas to determine the area and volume of objects as training material so that students are accustomed to seeing and observing and memorize objects in 3D cylindrical shapes open or closed.

Driver's License Exam Episode

This episode has a duration of 9 minutes 33 seconds with the beginning of the story of the two villains Kampret and Super Galak who stalk a woman in a park using a drone. They are after a diamond that the woman is wearing. They quickly drove to the park. Arriving at the park, Kampret then took the diamond with the thieves he had.

They managed to steal the diamond unnoticed by the woman who owns it. Then they swiftly headed for the car he parked across the park. The scene switches to a Monster who is practicing driving with a driving instructor. Long story short, Monster doesn't focus on driving practice until it almost violates traffic signs.

The monster, who was shocked, suddenly had his bag robbed by the criminal duo, immediately issued his moves to chase the criminal's car. The villain then takes out balls to hinder the movement of the Monster, but all obstacles are successfully passed by the Monster. Finally, Monster got his bag back and still chased the criminal until the criminal was caught by the nearest police. The stolen diamond is finally released and flies towards its owner, the woman in the yellow dress in the park.





Figure 4.8 A snippet of a driver's license exam episode

This episode consists of many geometric 3D objects that are displayed, but only a few objects that form the outline, namely the diamond of the woman in the yellow shirt which is the size of a 3D prism. Then there are the mirrors of the villain's car in the form of a 3D circle and balls that are ejected through the part of the villain's car which is also 3D

From this analysis it was concluded that students could estimate the area and volume of the 3D objects mentioned above. The prism has the dimensions of the base, hypotenuse and height, then there is the diameter and radius to determine the area and volume of the 3D object.

Discussion

Geometry Object Teaching Materials

According to Majid (2017), the use of teaching materials made by the teacher allows students to study learning according to competence because it will be sequential and systematic, so that at the end of learning students can master the competency completely and thoroughly. The teaching materials referred to in this book are in the form of information, tools and texts needed as lesson plans. The purpose of making teaching materials for this sterilization, according to Prastowo's statement (2015), namely:

- 1) Can help students learn something in their learning activities,
- 2) To prevent boredom when learning, various types of teaching materials are provided for students,
- 3) When teaching and learning activities, students are facilitated with the teaching materials provided, and
- 4) In order for learning activities to attract more students' attention.

The use of songs also plays a very important role, especially in the scope of early childhood education. It is known that the characteristics of early childhood are individuals who are active and mobile. This is where the task as an educator is to facilitate students' needs to continue to develop all children's abilities by taking into account the characteristics of early childhood. In fact, moving activities are of great

interest to children, because children can explore themselves for expression but still develop competence. songs for children cannot be just entertainment or filling activities between playing or learning activities.

Songs composed by the art of tone or sound in sequence, combination, and temporal relationship (usually accompanied by musical instruments) to produce musical compositions that have harmony and continuity (contain rhythm). And the variety of rhythmic tones or sounds is also called a song. Songs can be sung solo, in twos (duet), in threes (trio) or together (khor). Mei-Ying Liao, et al (2013) survey revealed that; that singing plays an important role for the development of children's music and education at the time of their kindergarten experience at the age of 5-6 years.

Although kindergarten teachers have limited ability to teach music, singing is one of the music activities used most predominately in kindergarten. Songs and singing are highly recommended as materials and learning processes in kindergarten classes. Singing is an activity that can enhance developmental skills. Mathematical logic skills include the ability to solve problems and create things with numbers and reasoning (Armstrong, 1999) in Musfiroh (2008:3.3).

CONCLUSION

Being smart logically means being smart in numbers and being smart in the law of thinking. Mathematical-logical intelligence includes three interconnected areas, namely mathematics, science (science) and logic. So logical-mathematical intelligence is the ability to see, understand numbers, shape concepts, patterns and solve simple problems. Learning media was developed through the stages of needs analysis and education, development, expert validation, small group trials, and large group trials, then ready to be implemented. For teachers who develop thematic-based song animation media, this can stimulate students to increase students' mathematical logical intelligence.

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