

DEVELOPMENT OF ROBOT MALIN KUNDANG MINIATURE DEVICES IN TRAINING LEARNING IN CLASS VI PRIMARY SCHOOL

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ABSTRACT

This research originated from a problem that occurred in the sixth grade of SDN 44 Alur Tengah, North Lintau Buo Subdistrict, Tanah Datar District, West Sumatra Province, originating from the problem of lack of concrete props about explaining the eclipse process. The purpose of this study was to improve the results of learning and motivation of students in following the learning process in the field of Natural Sciences, the material for the process of eclipses. The research used ADDIE Development Research (Analysis, Design, Development, Implementation and Evaluation). Improving student learning outcomes has increased from. Before the props were applied the average learning outcomes were 68.57 and after the average teaching aids were applied the learning outcomes were 83.33. The conclusion of this research is the application of Malin Kundang Robot Miniature Props Development can improve learning outcomes and activities of class VI students of SDN 44 Alur Tengah.

Keywords: Research, Development, Robot, Eclipse

INTRODUCTION

One of the basic competencies of science learning in class VI in elementary schools is that students are expected to be able to explain the process of eclipse. Learning that has happened so far the teacher only explains with pictures (Abstract Props) so that learning tends to be monotonous and unpleasant. Of course this will have an impact on the motivation and learning outcomes of students. The Planetarium Props

(concrete objects) in the school cannot be used because they have been damaged, corroded, broken and cannot function optimally.

According to Abin Syamsudin Makmun *in* Agus Taufik *et al.* 2011) suggests 3 (three) factors that influence the process and results of student learning in schools namely; input factors, process factors, and output factors. Input factors (input) include: (1) raw input, (2) Instrumental Input (Instrumental Input) includes teachers, curriculum, material and methods as well as facilities and facilities, (3) environmental input (input environment) which includes the physical environment, geographical, social and cultural environment.

In accordance with the statement above states that learning outcomes are influenced by three input, process and output factors. The problems that occur in SDN 44 Alur Tengah, Lintau Buo Utara Subdistrict, in the Input process, the condition of students lacks interest in participating in learning because teaching aids are less attractive so learning feels crisp. If learning is not interesting then the learning outcomes are also not satisfactory and the output (process of change) behavior and learning outcomes are not in accordance with what is expected by the National Education goals.

In teaching science learning in elementary schools the teacher uses several skills. One of them is Science Process Skills (KPS). According to Harlen *in* Nuryani) states that teachers are very instrumental in helping students develop science process skills. The teacher must provide opportunities to students for material exploration and phenomena. Discuss in groups and build ideas and encourage students to discuss critically about what has been done in the group. In accordance with the Science Process Skills Theory (KPS) above the learning problems that occur Students are not interested in listening to the teacher's explanation. Cooperative learning has also been done. Students are divided into several groups. The author also self-reflection and ask students. Some students answered that the eclipse image was not clear to the place where the students sat in the back seat. So that students are only silent and have no response.

Marisa *et al* (2011) stated that "if viewed from the aspect of formal state rules, we re-examine Law number 20 of 2003 concerning the national education system Article 25 paragraph 1 stated that" every formal and non-formal education unit provides

facilities and infrastructure that meets educational needs in accordance with the growth and development of the physical potential of the social, emotional and psychological intellectual intelligence of students ". Based on Law No. 20 of 2003 states that "schools must meet the needs of the education process in order to achieve national education goals". The teacher is an agent in the education process trying to fulfill the intellectual development of students by innovating to create a tool for Malin Kundang Robot Miniature in learning science to fulfill the needs of teaching aids. Based on the author's record for the last 2 years about science learning in class VI SDN 44 Alur Tengah tends to be stagnant at an average number of 68.25 in the 2014/2015 school year and 72.35 in the academic year 205/2016. Seeing the average number of learning outcomes The author innovates to create a new Planetarium learning props development. In addition to modifying the planetarium props the author also applied the Quantum Teaching learning model to improve learning activities. The author is interested in the Quantum Teaching learning model of the TANDUR model presented by Bobby de Potter, Mark Reardon and Sarah Singernorie.

Based on exposure to problems in the field and some of the above theories, in science learning it is necessary to use teaching aids to embed the basic concepts of eclipses. Grow motivation and enthusiasm for learning so that the achievement of national education goals is achieved. The author innovated by developing the Malin Kundang Robot Miniature props. If you don't use Malin Kundang Robot Miniature, the learning spirit of students is low and results in learning outcomes. The author also combines with the Theory of Quantum Teaching TANDUR which was initiated by Boby de Potter et al to increase students' interest in learning.

METHOD

The research method used was the ADD N (Research and Development) Method of the ADDIE Model with a limited scale experimental scale test. The ADDIE model is developed by Dick and Carry (1996) to design learning systems. According to Endang Mulyatiningsih (<http://staff.uny.ac.id>) ADDIE stands for Analysis, Design, Development or Production, Implementation or Delivery and evaluation. According to the steps of product development, this research and development model is more rational

and more complete than the 4D model. Based on expert opinion above, the ADDIE Research Model of Development consists of five stages, namely analysis, Design, Development, Implementation, and Evaluation. The research subjects were class VI students of SDN 44 Alur Tengah, Lintau Buo Utara Subdistrict, who sat in the 2017 school year with 21 people. The research location is in SDN 44 Alur Tengah, Lintau Buo Utara District, Tanah Datar District, West Sumatra Province. When the study was in January, dd. March 2017. The technique of collecting data is in the form of tests, interviews and observations at SDN 44 Alur Tengah, Lintau Buo Utara District..

RESULTS AND DISCUSSION

Flowchart in the process of discovering Malin Kundang Robot Props uses ADDIE Developer Research which begins with an analysis of the problems that occur in the field, namely in class VI SDN 44 Alur Tengah, Lintau Buo Utara District, Tanah Datar District, West Sumatra province.

Analysis

At this stage, a literature review of the material of the eclipse process is carried out. Reviewing various relevant research, discussions with senior teachers and consulting with Lintau 1 Vocational School Teachers as observers and expert teams in the development of Malin Kundang Robot Miniature Products.

Design

After the preparation process is complete, then the product design of the Malin Kundang Robot Props is then carried out. At this stage develop the teaching aids that have been made. The prototype 1 that was created was validated by a team of experts who collaborated with the Teachers of SMK 1 Lintau in Lintau Buo Utara sub-district Tanah Datar District to validate Malin Kundang Robot Props. In the process of developing teaching aids, there are several inputs and related suggestions regarding the usefulness and function of the product if applied to other subjects relevant to the Teaching Aids. From the development of Teaching Aids and Consultation with colleagues along with the Expert Validation team, several inputs were obtained regarding the Malin Kundang Robot Miniature props and produced a revision of the Props in the form of prototype 2.

Implementation

After receiving input from a team of experts and colleagues, the authors applied Teaching Aids in class VI SDN 44 Alur Tengah District of Lintau Buo Utara, Tanah Datar District. The next step is to apply teaching aids on Saturday, March 15, 2017. Following are some documentations on the application of Malin Kundang Robot Miniature Props in learning

Evaluation

At the evaluation stage a reflection was held on the implementation of Malin Kundang Robot props. Evaluation includes whether the application of Malin Kundang Robot has reached the goal of product development, what aspects have been able to be achieved by the product and the author looks for what causes students to be able to achieve good learning outcomes.

Practical Application in Learning

The Mechanism for Implementing Malin Kundang Robot Props in Learning The application of Malin Kundang Robot props has been applied at SDN 44 Alur Tengah, North Lintau Buo District, Tanah Datar District, West Sumatra Province. In the Development Stage, developing the Malin Kundang Robot Props. The team of experts from SMK 1 Lintau suggested that robots are not only used in the process of learning science about eclipses, Robot Malin Kundang can also be used when learning mathematics with material webs - webs for building space. The Malin Kundang robot can also be used on Indonesian language subjects with aspects of listening to Folk stories.

Design of Learning Innovation Work

- Product Name: Robot Malin Kundang
- Tools / Material Makers: Used paperboard, scissors, glue, saws, wood, plastic balls, wire, ruler, nails, color paper.
- Product Type: A type of planetarium teaching aid that was developed into a Mini Robot that explains the process of eclipses
- Level / Class: SD / class VI
- Integrated Thematic lesson material

The application of teaching aids on science learning with material explains the process of the occurrence of solar and lunar eclipses, students are very enthusiastic and passionate about learning. This is because so far in explaining the process of eclipse with images (Abstract) and collaborated with the Lecture Method. By applying the Malin Kundang Robot props by collaborating with the TANDUR Quantum Teaching Model, students were more enthusiastic. This is seen from the response of students when the author brings props to the class. Students begin to ask what objects are brought by the teacher. Students seemed eager to be assigned to draw a picture of the process of the Solar and Moon Eclipses. Where the position of the Sun, Earth and Moon is in a straight line. Students also often ask questions and respond to teacher questions quickly when the teacher gives a few quizzes. But of about 21 people the number of class VI students was 3 students who did not draw according to the teacher's direction. The 3 participants have different reasons. There were 2 students who did not carry a pencil when the teacher told them to draw. The other students also carry a pencil that has been blunt. But the teacher provides a solution so that students who do not bring pencils may borrow to the lower classes so that students can complete the task of drawing the eclipse process.

In Mathematics learning Malin Kundang Robot Props can also be used. Robot body parts can be assembled. Because the body parts of the Robot are made of cardboard which have been set up to be able to disassemble. Students are enthusiastic in drawing space-built nets. It is the same as drawing the eclipse process, in learning nets - there are also spaces where students do not do the assignments given. The reason is that students do not carry scissors.

During the last hour students learn Indonesian Language Subjects with Aspects Listening to the material listening to the teacher's explanation of folklore. The participants enthusiastically listened to the voice coming out of Robot Malin Kundang. Because this is only the beginning they listen to the sound of a robot object. The lesson was fun because all students quietly listened to the sound of the robot. At the end of the learning process the teacher instills religious values in the learning process. Learners are provoked with a number of questions such as who is the creator of heaven and earth? Who governs all the solar systems? with some questions about religion, the teacher

instills character with students. Benefits of Malin Kundang Robot Props a. Helping the teacher in explaining the process of eclipse. b. Malin Kundang Robot props provide benefits where 1 piece of props can be used in explaining 3 subject matter, namely

Data Analysis Results of Practical Applications of Learning Innovation

In terms of completeness of student learning outcomes based on Cognitive assessment, of the 21 students of class VI only 3 people did not complete. The author conducts interviews with students, why can't answer the questions given by the teacher. Some of the reasons fostered by students include students who are not concentrated while learning this because they remember the events in the home they experienced, namely their grandfather passed away exactly 1 day before the learning process. So students still remember memories with grandfather. Other students do not concentrate on learning because they do not eat breakfast. So that the stomach rumbles and only thinks that the resting bell rings fast.

Based on teacher interviews with students why the learning outcomes of students are still below the Minimum Criteria for completeness influenced by several factors. Among students who are not completely reversed put the position of the moon and earth in the picture when told to do the task of drawing the position of the Eclipse. In addition, students are also reversed in understanding the concept of umbra and penumbra in eclipse learning. In addition, students also admitted that there were those who had not yet breakfasted so that the mind of the students only thought of resting hours and the bell playing outside so that students did not concentrate in learning. In this case the teacher has given direction to students to always have breakfast before leaving school. In order to be able to capture the lesson well.

Dissemination Activities

Dissemination activities were carried out at the Cluster VI Cluster of North Lintau Buo Subdistrict, Tanah Datar District, West Sumatra Province. Dissemination activities provide feedback on input and suggestions to the author. Some Teachers gave constructive suggestions and criticism to perfect the Malin Kundang Robot Miniature Props.

CONCLUSION

Development of Malin Kundang Robot Teaching Aids can improve the learning outcomes of class students. And the learning activities of students have increased before and after the application of Malin Kundang Robot props.

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