

## DEVELOPMENT OF MEDIA WAYANG *HANDS ON ACTIVITY* BASED ON LOCAL WISDOM- TO IMPROVE MATH PROBLEM SOLVING ABILITY FOR GRADE IV SDN 1 KUNDURAN

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### Abstract

**Very Kritiyanti.** 2023. Development of Media Wayang *Hands On Activity* Based on Local Wisdom to Improve Math Problem Solving Ability for Grade IV SDN 1 Kunduran. Problem solving abilities are less directly related to real life and lack of interesting and challenging practical activities for students to complete. Through the media wayang hands on activity assist students in carrying out project activities with cultural practice activities that assist students in building their own knowledge. This study aims to determine the learning tools used are valid, practical, and effective. The results of the development of learning tools are as follows: (1) the learning tools developed are valid; Syllabus with an average of 4.22 (very good); RPP with an average of 4.21 (very good); Textbooks with an average of 4.26 (very good); LKS students with an average of 4.32 (very good); and test problem solving abilities with an average of 4.14 (good); (2) the learning tools are stated to be practical, namely: a) the use of the tools in good learning has an average of 4.41, b) positive student responses have an average of 4.31; (3) learning mathematics is stated to be effective, marked by the achievement of: classical completeness reaching a proportion of more than 75%, students' solving abilities through hands on activity are better than conventional classes, the proportion of students' solving abilities through hands on activities is greater than in conventional classes , process skills and the character of love for wayang culture have a positive effect on problem solving abilities, and there is an increase in problem solving abilities, process skills and character of love for wayang culture.

The development of local wisdom-based wayang *hands-on* activity media can assist teachers in carrying out practical learning activities in making puppets and performing puppet shows to solve student problems, so that the learning process is carried out more deeply and meaningfully. Thus the knowledge gained by students will be remembered and not easily forgotten.

**Keywords:** *Wayang, Hands On Activity, Problem solving ability*

### 1. Introductions

The whole world of Indonesian funds needs an extraordinary education system because education is the most important thing in understanding the meaning of educational goals, as usual there are many definitions of education that provide different definitions of education. John Dewey

in (Sudharto, 2009) argues that education is the process of forming intellectual and emotional fundamental skills towards nature and fellow human beings. Dictionary of Education Education is the process by which a person develops abilities, attitudes and other forms of behavior in the society in which he lives. Education is a social process in which people are exposed to selected and controlled environmental influences (especially those that come from school), so that they can obtain or experience the optimum development of social abilities and individual abilities.

National Education System No. 20 of 2003 concerning the national education system that education article 1 paragraph 1 that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character , as well as the skills needed by himself, the community, the nation and the state. The functions and objectives of national education are set forth in Law Number 20 of 2003 concerning the National Education System article 3 which reads that national education functions to develop capabilities and form dignified national character and civilization in the context of educating the nation's life, aiming at developing the potential of students so that become a human being who believes in and fears God Almighty, has noble character, is healthy, knowledgeable, capable, creative, independent and becomes a democratic and responsible citizen.

The aim of education has been conveyed that our education, the Indonesian nation in general, aims to produce human resources who realize their potential in developing abilities, forming character and developing the skills needed for themselves, society, nation and country. To achieve the educational goals listed in Law Number 20 of 2003 concerning the National Education System, it is necessary to rearrange the paradigm of the education system in Indonesia.

The existence of a balance between attitudes, skills, and knowledge results in learning in all subjects having to link the three competencies that must be achieved. Mathematics is one of the subjects that realizes the achievement of educational goals which include attitudes, skills, and knowledge. In the 2006 mathematics content standard it is stated that mathematics is studied with the aim that students have several abilities, namely: the ability to understand mathematical concepts, use reasoning, solve problems, communicate ideas, and have an attitude of appreciating the use of mathematics in everyday life (Wardhani, 2010). In some of the abilities listed in the standard content of mathematics subjects, it is necessary to have additional skill abilities that students use to utilize mathematics itself.

Mathematical abilities that are in accordance with educational goals realize one's potential by developing abilities, forming character and developing the skills needed for oneself, society, nation and state. One aspect of ability in mathematics that is not given enough attention in learning is the activity of utilizing mathematics. Some of the abilities that are considered in learning mathematics only relate problem-solving abilities and attitudes that are developed, while the skills that should be used in the life of society, nation and state are still not visible. Mathematics learning which includes problem solving abilities with developed characters and skills that can be utilized for the benefit of society, nation and state.

Research on students' low problem-solving abilities is caused by the learning process in class does not improve high-order thinking skills and is not directly related to real everyday life (Sadiq, 2007). Statement (Kadir, 2008), that students' higher-order mathematical thinking skills can be trained by providing interesting and challenging problems that can be solved by mathematical methods. Likewise the opinion (Hughes, et al, 2003), that students try to learn through practical activities that are intrinsically interesting, give them a challenging problem to solve, and choose subject matter that has an appeal to their natural interests.

From several studies, it was found that the low problem-solving ability of students can be improved by providing real-life problems that are challenging and can be solved with the mathematical skills they have acquired. One of the researchers suggested that activities to develop problem-solving abilities with practical activities and choose subject matter that has an appeal to their natural interests. So practical activities can be the key to developing their problem-solving abilities by providing material that has appeal.

Utari et al (2016) argue that local wisdom is knowledge, beliefs, norms, customs, culture, and insights in an area that have been passed down from generation to generation and are still held to be used as guidelines in acting correctly in life. According to Shufa (2018: 49) the integration of local wisdom aims to create learning that is not only focused on knowledge but also instills a sense of love for diversity in the environment around students, so that they can maintain local local wisdom in the midst of the current era of globalization. Toharudin and Kurniawan (2019) in the International Conference on Mathematics and Science Education revealed that local wisdom can be combined with technological developments to create innovative learning models and media that are able to improve thinking skills, students' literacy skills, and student behavior in accordance with the values of wisdom. local.

Based on the experience of teaching researchers at SDN 1 Kunduran, Kunduran District, Blora Regency, they found that the learning that was carried out was only in the form of problems that were commonly found. There is no innovative mathematics learning media that utilizes the local culture. Students easily get bored with learning mathematics because it is considered difficult. Lack of questions about problem-solving skills in mathematics that relate to wayang culture and character cultivation. The book which is the student's handbook has not been utilized in real life. One of the media that can examine all material so that the material has an attraction with students' practical activities that aim to improve problem-solving skills faced by students, as well as an effort to develop student character in learning activities, the learning media is wayang media.

Through wayang media students can build their own knowledge. Not only using puppets, but students are required to make puppets according to the problems raised in learning. The puppets that have been made by students can be used for subsequent learning regarding rotation, dilation and translation material by carrying out puppet performances. The use of wayang media can indirectly preserve our regional culture. Learning mathematics with cultural nuances will make a major contribution to school mathematics, because schools are social institutions that are different from others, thus enabling socialization between several cultures (Shirley, 2008). Learning that relates material to the cultural environment will encourage students to make connections between the knowledge they have and its application in everyday life. Learning by using wayang media as a learning activity is ethnomathematics learning. According to (Rosa, 2011) the application of ethnomathematics in learning can develop mathematical understanding and can increase the absorption of mathematical concepts.

The absence of learning media that utilizes problem-solving abilities for the needs of students in the world of work has become a research initiative to develop learning media. Learning media that have not taken place and are still in the developmental stage, are the basis for conducting research on the development of learning media. Development of learning media that can improve solving abilities with students' practical activity skills in utilizing knowledge, as well as mirroring attitudes in learning activities. From the problems that have been stated above, the researcher offers a solution with a learning model that is appropriate to the context of the problem to improve problem solving with students' practical activity skills in utilizing knowledge, as well as mirroring attitudes in implementing learning activities. The Project Based Learning model is an effort to improve problem solving skills, students' practice activity skills in utilizing knowledge, as well as a reflection of attitudes in learning activities. According to Jones et al., as cited by (Thomas, 2000),

PBL are assignments given based on challenging questions or problems, involving students in designing, solving problems, making decisions, or investigating activities, giving students the right to autonomously over a period of time, and culminating in a tangible product or presentation.

The project based learning model used in learning needs a process of practical skills as an activity in problem solving, namely hands on activity is an activity designed to involve students in digging up information and asking questions, doing activities and finding, collecting data and analyzing and making their own conclusions. (Kartono, 2010). The stages of the hands on activity are almost the same as the process of solving the problem described by Polya. Hands on activity as an activity that allows students to observe, carry out activities, and manipulate scientific processes by conducting experiments on phenomena experienced by students (Hussain and Akhtar, 2013). Hands on activity makes activities based on activities of finding, collecting data, analyzing then making their own conclusions, can help improve students' problem solving abilities.

The learning model of project based learning through hands on activity which contains ethnomathematics, namely by using wayang media will help preserve culture by getting to know culture more deeply. Projects that are done by making wayang, getting to know wayang characters, and doing wayang performances. Wayang media is an ongoing project activity, while hands-on activity is used to assist students in carrying out experiments or practical activities in solving a given problem. Some of the important roles of wayang media in this study are wayang as a learning medium, learning project materials, learning activities, media for preserving culture and as a character builder for students.

The puppet media used will be combined with today's technological advances, so that the puppet media will further increase the motivation and meaningfulness of learning. One of the latest types of learning media is the computer, which can be used to convey learning materials interactively and can facilitate learning because it is supported by various aspects: sound, video, animation, text, and graphics (Rahmat, 2005). By utilizing today's information and technology, wayang media combined with information media and technology will increase students' interest, activity, and learning motivation. Media Information and Technology (IT) will be used in wayang performances in class. Sound effects, videos, animations, texts and graphics that will be shown in the media will help students understand the concept of knowledge provided. Students can develop characters through wayang stories. Wayang stories present a model of life with characters worthy of emulation. If you see or read wayang stories that feature the opposition of good and evil characters, people will choose good characters (Nurgiyantoro, 2011). Characters developed in wayang

performances as a means to teach various necessities of life, provide moral teachings, ethics of life, and pass down views on life. As a whole, wayang characters and wayang media used in learning will create a love for culture. In this study, the character aspect formed is love for wayang culture to improve the problem solving skills of fourth grade students at SDN 1 Kunduran.

## 2. Research Methods

This type of research uses research and development or often called Research and Development (R&D). According to Sugiyonoo (2015) defines as a technique or scientific way to research, design, produce and test the validity (effectiveness) of products that have been produced or can be shortened to 4P (Research, Design, Production, and Testing) which aims to find practical knowledge until it can be apply in the learning process.

The development model used is the Borg and Gall model (in Sugiyono, 2015), namely: (1) potential and problems; (2) data or information collection; (3) product design; (4) design validation; (5) design revisions; (6) product trials; (7) product revisions; (8) use trial test; (9) product revisions; (10) manufacture of mass products

Place This research was conducted at SD Negeri 1 Kunduran, Jl. Raya Kunduran, Kunduran District, Blora Regency, Central Java Province. Time This research was carried out in the even semester of the 2022/2023 academic year.

## 3. Result and Analysis

Based on the results of the research and discussion, this study has the following conclusions:

- 3.1. The characteristics of developing learning tools using the Borg and Gall model development steps which have been modified into research study and data collection stages, planning stages, initial product development stages, initial field trial stages, field trial stages and field implementation test stages result in development media wayang hands on activity based on local wisdom to improve valid mathematical problem solving skills for class IV SDN 1 Kunduran, as well as the application of practical and effective learning tools.
- 3.2. The development of local wisdom-based wayang hands-on activity media to improve mathematical problem-solving skills in geometry material has been validated by experts, and the result is that the syllabus is included in the very good category with an average score of 4.29, the lesson plan is in the very good category with an average score - average 4.21, textbooks in the very good category with an average score of 4.22, LKS in the very good

category with an average score of 4.32, and problem solving ability tests in a good category with an average score of 4.14. Experts state that the learning tools developed in this study are valid and can be used in learning.

- 3.3 Development of local wisdom-based wayang hands-on activity media to improve mathematical problem-solving skills using wayang media is declared practical. This is indicated by the student's response to positive learning having an average of 4.31, and the use of devices in learning is included in the very good criteria with an average of 4.41.
- 3.4. The application of learning mathematics by developing local wisdom-based wayang hands-on activity media to improve mathematical problem-solving skills is declared effective. This is indicated by: (a) the proportion of students who are taught achieves KKM of more than 75%, (b) the average value of students' problem-solving abilities is better than students who are taught by conventional models, (c) the proportion of students' problem-solving abilities completeness students who were taught were greater than students who were taught by conventional methods, (d) there was an influence of process skills and an attitude of love for wayang culture on students' problem-solving abilities of 85.7%, (e) there was an increase in the problem-solving abilities of students who were taught there was an increase process skills and students' attitudes towards wayang culture.
- 3.5. There is an interaction of process skills based on low, medium, and high criteria for loving wayang culture with low, medium, and high criteria for problem solving abilities. The interaction that occurs between process skills and the character of wayang culture is due to project activities carried out by students using wayang media. The project activities carried out make students practice process skills with hands on activities by making puppets and performing puppet shows. The relationship between process skills and the character of love for wayang culture is a project that is carried out with activities when making wayang and performing wayang performances.

#### **4. Closing**

Based on the results of the research and discussion, this study has the following conclusions:

- 4.1. Development of local wisdom-based wayang hands on activity media to improve math problem solving skills for Class IV SDN 1 Kunduran has been validated by experts, and the result is that the syllabus is included in the very good category with an average score of 4.29, the lesson plan is in the very good category with an average score of 4.21, very good



category of textbooks with an average score of 4.22, very good LKS category with an average score of 4.32, and a good category of problem solving ability tests with an average score of 4, 14. Experts state that the learning tools developed in this study are valid and can be used in learning.

- 4.2. The development of local wisdom-based wayang hands-on activity media to improve math problem-solving skills for class IV SDN 1 Kunduran is declared effective. This is indicated by: (a) the proportion of students who are taught achieves KKM of more than 75%, (b) the average value of students' problem-solving abilities is better than students who are taught by conventional models, (c) the proportion of students' problem-solving abilities completeness being taught is greater than students taught by conventional methods, (d) there is an influence of process skills and attitudes of love for wayang culture on students' problem-solving abilities of 85.7%, (e) there is an increase in students' abilities, an increase in process skills and attitudes students on wayang culture.



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