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Increasing Interest and Learning Outcomes in Numbering 1-100 in Elementary School through Sticks and Cards Media

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1. Abstract

This study aims to improve the interest and learning outcomes of grade 1 primary school students in the ability to count numbers 1-100 using stick and card media. The ability to count numbers 1-100 is a basic competency that students must master at the basic education level. However, students often face challenges in understanding and developing these skills. This study involved grade 1 students as research subjects and identified problems including low student interest in learning, lack of variety of interesting learning methods, inappropriate use of media, and low student learning outcomes in the ability to count numbers 1-100. The theoretical foundation of the research includes constructivism learning and multiple intelligences principles. The research method used was Classroom Action Research with two cycles, each cycle consisting of planning, implementation, observation, and reflection. In the learning process, stick and card media were used to visualise numbers and build students' understanding. The results showed that the use of stick and card media effectively increased students' interest in learning the ability to count numbers 1-100. In the first cycle, there was an increase in students' interest in learning characterised by active participation, enthusiasm and interest in learning. In the second cycle, students' interest in learning increased further with the variation of activities using the media. In addition, the sticks and cards media also contributed to the improvement of students' learning outcomes in number skills. Students showed an increase in concept understanding, ability to identify numbers, and application in real situations. The test results showed a significant improvement in the second cycle compared to the first cycle. Overall, the use of stick and card media effectively improved students' interest and learning

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outcomes in the ability to count numbers 1-100 in grade 1. The media helped students visualise numbers and build better understanding. The results of this study are expected to be a reference for teachers in improving the learning of numeracy skills and motivating students to learn mathematics better.

Keywords: *Sticks and Cards Media, Interest and Learning Outcomes, Numbering, Constructivism, Multiple Intelligences*

2. Introduction

Education is an important foundation in shaping individuals with quality and potential. At the basic education level, such as primary school, building a strong foundation in learning mathematics is crucial. The ability to count numbers 1-100 is one of the basic competencies that must be mastered by students at the grade 1 education level. However, in the learning process, teachers often face challenges in improving students' interest and learning outcomes in this ability. The context of this research is one of the primary schools in Yogyakarta, which has students with diverse backgrounds, both in terms of ability and interest in learning. One of the challenges faced by teachers in this primary school is teaching the ability to count numbers 1-100 with methods that are interesting and effective for students.

In the learning process of counting numbers 1-100, several problems were identified. Firstly, students' interest in learning the material tends to be low. Students may consider it a monotonous and uninteresting material. Secondly, the limited learning media that is interesting and can facilitate student understanding is an obstacle for teachers in creating an effective learning atmosphere. Third, the low student learning outcomes in the ability to count numbers 1-100 is a serious concern in improving the quality of learning. Therefore,

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this study aims to improve students' interest and learning outcomes in the ability to count numbers 1-100 by using stick and card media for grade 1 elementary school students.

In this study, the media was chosen because it can provide an interactive and interesting learning experience for students. With the use of appropriate media, it is expected that students will be more interested, active, and involved in learning, so as to improve their understanding and learning outcomes. The theoretical foundations used in this research include the concept of constructivism learning which emphasises the active role of students in constructing knowledge and understanding, and the principle of multiple intelligences which recognises the existence of different intelligences in each individual. By combining these theories, it is hoped that effective corrective actions can be designed and implemented to increase students' interest and learning outcomes in the ability to count numbers 1-100 for grade 1 students.

3. Methods

3.1. Participants and Context

This study involved grade 1 students of one of the elementary schools in Yogyakarta as the main participants. The number of students involved in this study was 28 students who were randomly selected from one class in the school. The context of this study is the learning environment in 1st grade.

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3.2. Material

Materials used in this study include:

a. Media stick: Wooden sticks with numbers 1-100 used to visualise the number sequence and help students recognise and understand the numbers.
b. Cards: Cards containing numbers 1-100 used for various learning activities such as games, number sequencing, and matching numbers to their representations.
c. Observation sheet: The observation sheet was used to record students' participation, interest in learning, and interaction with the stick and card media during the learning process.
d. Numeracy test: The test was conducted before and after the intervention using stick and card media to measure the improvement of students' learning outcomes in numbering ability 1-100.

3.3. Data Collection and Analysis Techniques

The data collection techniques used in this study include:

a. Observation: Observations were made to monitor students' participation, interest in learning, and interaction with the stick and card media during the learning process. Observation data was recorded using an observation sheet.
b. Numeracy test: Numeracy tests were conducted before and after the intervention using stick and card media. This test aims to measure the improvement of students' learning outcomes. The test data was analysed quantitatively by comparing the results before and after the intervention.

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Data analysis in this study will use both qualitative and quantitative approaches. Observation data and test results will be analysed descriptively to understand students' participation and their interest in learning. Numeracy test data will be statistically analysed using a comparison test to identify the improvement of students' learning outcomes after the intervention using stick and card media. The results of the data analysis will be used to draw conclusions and provide recommendations in this study.

3.4. Ethical Considerations

a. Obtaining Permission and Approval: Before conducting research, it is important to obtain permission and approval from authorised parties, such as educational institutions. This ensures compliance with applicable rules and regulations and maintains the privacy and safety of research participants.
b. Confidentiality and Anonymity: It is important to keep the identity of research participants confidential. Personal identities, including names and other personal information, must be kept confidential and not disclosed without the written consent of the participants. If participants' identities are disclosed in the research report, be sure to use pseudonyms or disguise information that could identify them.
c. Informed Consent: Ensure that the research participant, or parent/guardian in this case, gives written informed consent before participating in the research. Clearly inform them of the purpose, methods, risks, benefits, and rights of the research. Make sure they understand the information and give their consent voluntarily.
d. Benefits and Risks: Consider the possible benefits and risks associated with the study. Ensure that the benefits of the study outweigh the possible risks, and make

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efforts to reduce the risks as much as possible. Safeguard the safety and wellbeing of participants during the study.

e. Disclosure of Conflicts of Interest: If there are any conflicts of interest that might affect the objectivity of the research, these should be disclosed honestly and transparently. Avoid influences or biases that could undermine the integrity of the research.
f. Use of References and Acknowledgement: Be sure to give proper recognition to the contributions of other authors or reference sources used in the study. Avoid plagiarism and give proper credit to those who contributed to the research.
g. Honest Reporting: Research reports should be honest, accurate, and transparent. Avoid data manipulation or misleading presentation. If there are significant changes in the study design or results that are not in line with expectations, they should be reported objectively.

3.5. Research Limitations

a. Generalisability: The limitations of this study are related to the generalisability of the results. This study was conducted in one primary school in Yogyakarta, involving Grade 1 students. Therefore, the results of the study may not be directly applicable to other primary school student populations or at different grade levels. The results of this study need to be validated through further research involving larger samples and from various locations.
b. Duration of Research: This study was conducted over a limited period of time. The short duration of the study may not allow for long-term monitoring of the impact of

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using stick and card media on students' interest and learning outcomes. Therefore, the results of this study only reflect the short-term effects of the intervention.

c. External Variables: There may be external factors that may influence students' interest and learning outcomes that were not controlled for in this study. Variables such as environmental factors, parental roles, or individual student differences may have an impact on the observed learning outcomes. Although efforts were made to isolate the influence of stick and card media, these external factors are still likely to influence the results of the study.
d. Use of Media: Although stick and card media were used in this study to improve students' interest and learning outcomes, there is no guarantee that these media are universally suitable for all students. There may be individual variations in preference and response to the use of these media. Some students may be more responsive to this media, while others may not be as affected by it.
e. Teacher Influence: Although stick and card media were used in this study, it is important to remember that the role of the teacher also has a significant influence in the learning process. Factors such as teaching quality, teaching approach, and teacher-student interaction can also affect students' interest and learning outcomes. The influence of these variables cannot be completely isolated in this study.
f. Interest Measurement: The measurement of students' learning interest in this study may be subjective and may be influenced by other factors beyond the use of stick and card media. Students' learning interest may be influenced by personal factors, environment, or previous experiences, which are difficult to fully control in this study.

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4. Results and Discussion

Based on the implementation of classroom action for 2 cycles conducted 4 times a meeting and 1 meeting of pre-cycle activities, the data obtained that students' interest and learning outcomes have increased. The increase in interest in learning was successful by applying a *problem-based learning* model using stick and card media. The results of observations of the application of the *problem-based learning* model can be seen in the following table:

Table 1. Comparison of Observation Results of Student *Learning* Interest Using *Problem-based Learning* Model cycle I and II

Student *Learning* Interest Using *Problem-based Learning* Model	
Cycle I	**Cycle II**
55%	80%
Good	Very good

Based on the table above, the percentage of observations of student interest in learning using the *problem-based learning* model in cycle I was 55% with a good category, while in cycle II it reached 80% with a very good category. The results of observations of student interest and learning outcomes using the *problem-based learning model* increased from cycle I to cycle II by 25%. The increase in student interest and learning outcomes is known from student learning outcomes in cycles I and II as follows:

Comparison of Student Evaluation Results Cycle I and II

Description	**Value**	
	Cycle I	**Cycle II**
Average	85,4	91,25
Highest score	100	100
Completed KKM	21	24

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Not Completed KKM	7	4
Percentage of KKM	75%	85,7%

Based on the research that has been carried out, it is known that the learning outcomes of students in learning Mathematics through the application of *problem-based learning* models have increased. The average student score increased from cycle I of 85.4 to 91.25 in cycle II. Based on this data, it is known that students who have passed the KKM in cycle 1 were 21 and in cycle II were 24. The achievement of classical learning outcomes in cycle II has reached the success indicator because students experience individual learning completeness ≥ 75. The results of teacher activity observations using the *problem-based learning* model in cycles I and II are presented in the following table:

Table 3. Comparison of Observation Results of Teacher Activity Using *Problem Based Learning* Model cycle I and II

Teacher Activity Using Problem Based Learning Model			
Cycle I		**Cycle II**	
Meeting I	Meeting II	Meeting I	Meeting II
77%	80%	83%	91%

The results of teacher activity observations in cycle I meeting I obtained a percentage of 77%. Cycle I meeting II increased the percentage to 80% with very good criteria. Cycle II meeting I obtained 83% and cycle II meeting II increased to 91% with a very good category. In cycle I and cycle II there was an increase in the percentage of each meeting because the teacher had succeeded in providing teaching. So students can get the value of completeness and experience increased

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interest in learning. The use of *problem-based learning* models with stick and card media in learning Mathematics makes the learning process more active and fun so that all students can be involved in the learning process with a happy feeling.

Through media sticks and cards, students' interest in learning increases so that learning outcomes become more optimal. The *problem-based learning* model makes students more active by solving a problem at the beginning then discussing with the group and through activities to arrange flat shapes into a form of object makes it easier for students to understand the material taught. After that students are guided to make presentations in front of the class making students more enthusiastic in participating in learning. According to (Savery: 2006) in the problem-based learning model students are given a problem or complex situation that requires critical thinking, collaboration, and the application of previously learned knowledge and skills. "PBL integrates the learning of knowledge, skills, and attitudes through authentic problem solving" so that students are actively involved in the learning process. In addition, Sofan Amri (2013: 5) explains Problem Based Leraning as a teaching activity that begins with giving real problems in order to guide students to develop various skills and think critically in solving problems presented by educators. This is in accordance with learning activities in class I mathematics subject matter numbering numbers 1-100. The use of *problem-based learning* models with media sticks and number cards makes students more active and increases critical thinking so that their interest in learning increases.

5. Conclusion

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This study aims to improve students' interest and learning outcomes in the ability to count numbers 1-100 using media sticks and cards in grade 1 SD. Based on the data analysis and findings in this study, the following conclusions can be drawn:

a. The use of stick and card media is effective in increasing students' interest in learning the ability to count numbers 1-100. The use of these media is able to visualise numbers and make the learning process more interesting and interactive for students. In this study, there was an increase in students' interest in learning which was shown through active participation, enthusiasm, and interest in learning.
b. The use of stick and card media contributes positively to improving student learning outcomes in the ability to count numbers 1-100. Students showed improvement in concept understanding, ability to identify numbers, and application in real situations. Numeracy test results showed significant improvement in the second cycle compared to the first cycle.
c. The stick and card media provides a variety of interesting and effective learning methods in teaching the ability to count numbers 1-100. Through the use of these media, students can visualise the number sequence clearly, build better understanding, and increase active engagement in the learning process.
d. The importance of the teacher's role in implementing the use of stick and card media effectively. Teachers must have a good understanding of how to integrate this media in learning, provide appropriate guidance, and create an atmosphere that facilitates student participation.

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The conclusion of this study is that the use of stick and card media in learning the ability to count numbers 1-100 in grade 1 SD, can increase students' interest in learning and learning outcomes. The use of these media provides an interactive learning experience, visualises concepts clearly, and motivates students to be more active in learning mathematics. The results of this study can provide recommendations for teachers and educational institutions to consider using stick and card media in improving learning the ability to count numbers 1-100 at the primary level.

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