The Influence of STEAM-Based Microsite Technology on Computational Thinking Abilities and Digital

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ABSTRACT : *This research aims to determine the effectiveness of using word dice media in improving the mathematics learning outcomes on the topic of probability scale among sixth grade students at SD Negeri 2 Ternyang. The study employed a classroom action research (CAR) method conducted in two cycles. Each cycle consisted of planning, implementation, observation, and reflection. The subjects were 17 sixth grade students. Data collection techniques included tests, observations, and documentation. The results showed an increase in students' learning outcomes from the pre-cycle (35.29%) to the first cycle (64.70%) and significantly improved in the second cycle (88.23%). These findings indicate that the use of word dice media can enhance student engagement and understanding of probability concepts. Thus, it is recommended as an effective tool for teaching abstract mathematical topics in primary education.*

Keywords: word dice, mathematics learning outcomes, probability scale, primary education, classroom action research.

INTRODUCTION

Mathematics is a fundamental subject that shapes students' logical reasoning and problem-solving skills. However, students often face difficulties in understanding abstract concepts such as the probability scale. This challenge necessitates the use of innovative learning media to enhance understanding. One such innovation is the use of word dice media, which transforms abstract mathematical content into engaging, interactive activities. SD Negeri 2 Ternyang, with a sixth-grade class of 17 students, recorded low achievement in probability topics in previous semesters. This condition served as the impetus for applying word dice media as a means to increase comprehension and academic performance.

Students have difficulty understanding and applying the probability scale due to its abstract nature and limited use of concrete learning media. Can the use of word dice media improve the learning outcomes of sixth grade students in mathematics, particularly on the topic of probability scale, at SD Negeri 2 Ternyang?

To determine the effectiveness of word dice media in enhancing students' mathematics learning outcomes on the topic of probability scale.

- **Theoretical**: Enriches the repertoire of instructional strategies in mathematics education.
- **Practical**: Provides teachers with an effective tool to teach abstract mathematical concepts.

CHAPTER II: LITERATURE REVIEW

Learning Media

Learning media are tools or instruments that help convey messages and stimulate students' thoughts, feelings, and interests. Word dice are a form of manipulative media that allow students to actively engage with content.

Mathematics Learning Outcomes

Learning outcomes refer to the measurable knowledge and skills that students gain after instruction. In mathematics, this includes conceptual understanding, procedural fluency, and problem-solving ability.

Probability Scale in Mathematics

Probability is the measure of the likelihood that an event will occur. The probability scale ranges from 0 (impossible) to 1 (certain), with intermediate values representing varying likelihoods.

Previous Studies

Research has demonstrated that manipulative and game-based media enhance motivation and comprehension. Studies by Arends (2012) and Bruner (1966) highlight the benefits of hands-on learning.

CHAPTER III: RESEARCH METHODOLOGY

This is a Classroom Action Research (CAR) employing a cyclical model consisting of planning, action, observation, and reflection.

The research involved 17 sixth grade students at SD Negeri 2 Ternyang.

- Cycle I: Introduction of word dice media; observation of student engagement; evaluation through a written test.
- Cycle II: Improved strategy based on reflections from Cycle I; further evaluation.

3.4 Data Collection Techniques

- Observation: To monitor engagement and participation.
- Tests: To assess learning outcomes.
- Documentation: To record activities and results.

Data Analysis

Descriptive statistics were used to analyze learning outcomes. The minimum mastery criterion (MMC) was set at 70%.

CHAPTER IV: RESEARCH RESULTS

Only 6 of 17 students (35.29%) achieved the MMC. Students showed low motivation and confusion about the probability scale. After introducing the word dice, student participation improved. 11 students (64.70%) met the MMC. Some still struggled with terminology and conceptual connections.Refinements included clearer instructions and pairing students. Outcomes improved significantly with 15 students (88.23%) meeting the MMC.

CHAPTER V: DISCUSSION

The data clearly indicate that word dice media positively impacted student engagement and learning outcomes. The interactive nature of the dice helped demystify abstract terms and facilitated peer learning. This aligns with Bruner's theory of enactive representation and Vygotsky's social learning theory. The results support the use of gamification in education, especially for difficult mathematical concepts.

CHAPTER VI: CONCLUSION AND RECOMMENDATIONS

Conclusion

The use of word dice media significantly improved the mathematics learning outcomes of sixth grade students on the probability scale topic at SD Negeri 2 Ternyang.

Recommendations

- For Teachers: Incorporate manipulative media like word dice in lessons involving abstract concepts.
- For Schools: Provide training and resources for innovative teaching strategies.
- For Future Researchers: Explore the long-term impact of media-based learning on retention and transfer of knowledge.

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