The 'Fisika Gasing': Enhancing Kinematics Understanding and Student Satisfaction in a Biology Education at Mataram University

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Abstract *- The influence of the 'Fisika Gasing' technique on kinematics comprehension and student satisfaction was explored in this research of 27 biology education students. The study used a post-test design and an 8-item questionnaire to assess students' understanding of important concepts after participating in the 'Fisika Gasing' exercises, as well as their general satisfaction with the approach. The analysis of the post-test findings demonstrated that students' kinematics understanding improved significantly, confirming the method's efficiency in fostering conceptual knowledge. Furthermore, questionnaire results demonstrated a high level of satisfaction with the 'Fisika Gasin', emphasizing its capacity to generate engagement, improve knowledge, and raise confidence in dealing with kinematics challenges. These findings imply that the 'Fisika Gasing' approach has a lot of potential as a fascinating and effective pedagogical tool for boosting kinematics learning and cultivating student happiness in biology education programs. Further study on its long-term influence and applicability in various learning contexts is urged.*

Keywords*: Fisika Gasing; Kinematics; Biology Education Students*

INTRODUCTION

Physics is a natural discipline that studies matter, its fundamental elements, motion and behavior in space and time, and the related phenomena of energy and force. Physics is one of the most fundamental scientific fields, with the primary purpose of understanding how the universe functions. To understand physics better, students at universities are required to take basic physics lectures.

Basic physics courses are required for students majoring in Mathematics and Natural Sciences (PMIPA) at Mataram University's Faculty of Teacher Training and Education (FKIP). Physics Education, Biology Education, and the Chemistry Education Study Program are all part of the Department of Mathematics and Natural Sciences. Basic physics lectures consist of three credits of theoretical lectures in class and one credit of laboratory practice. The practicum was held at the physics laboratory of Mataram University's Department of Mathematics and Natural Sciences, FKIP. This physics laboratory is designed exclusively for students majoring in Mathematics and Natural Sciences Education, whereas students in other study programs and majors complete basic physics practicum in the FMIPA Basic Physics Laboratory (Zuhdi & Makhrus, 2020).

For a variety of reasons, student interest in physics is poor. For starters, physics is frequently seen as difficult and irrelevant, which leads to a lack of enthusiasm among students (Melinia et al., (2021); Nurdiansah & Makiyah, (2021)). Furthermore, some students find particular aspects of the physics curriculum to be uninteresting, while others find them to be engaging. There are also disparities in the reasons why males and females find physics uninteresting, with males appreciating practical activities and females valuing the relevance of physics. Furthermore, the idea

that physics is "too difficult" has led to a drop in student interest in physics as a career in nations such as Australia. School curriculum changes have also been cited as a factor leading to the drop in student interest in physics. This is in line with research presented by (Nurfathoanah, 2017).

Surya created learning methods in 1995, TOP constructivism is now a learning technique called *Fisika Gasing (Gampang, Asik & Menyenangkan)*.

Figure 1. Fisika Gasing Symbol

Surya spent 13 years researching physics lessons that are easy for students to accept, easy for teachers to teach, and make educating participants feel pleasant and pleasurable while establishing the Indonesian Physics Olympiad Team. According to the findings of Surya's research, three factors must be considered in order to make physics easy, fun, and pleasurable (Gasing): a). Avoid complicated mathematics; instead, search for alternatives that employ easier mathematics, b). Use reasoning rather than derived formulae to benefit from a good knowledge of physics ideas, when explaining topics through example questions (, c). use simple, round numbers such as 1, 2, or 10. Avoid using commas or fractions to avoid diverting students' attention away from physics answers and toward mathematical solutions, d). Increase direct communication with students, particularly concerning freshly taught physics ideas. In order to answer questions on the provided subject, ask them to share their thoughts. e). Increase the number of physics experiments and demonstrations so that every student may experience the enjoyment of physics. (Utomo, (2023).

GASING is a strategy for learning that employs simulations or examples from everyday life to teach students how to reason logically. Physics is simple, enjoyable, and must be cultivated in children in the classroom. (Rita, Suyoso, 2018).

The material developed by Surya in gasing physics includes kinematics and particle dynamics as a basis for understanding more complex physics. However, in this study, we focus on kinematics only.

Kinematics, the study of motion and its causes, forms a fundamental element of physics and serves as a prerequisite for understanding subsequent concepts. However, traditional teaching methods often struggle to engage students and effectively convey abstract concepts, leading to difficulties in comprehending and applying kinematic principles.

Research related to gasing physics is strengthening basic concepts of physics for students and teachers at the Aikmual Islamic Boarding School, Central Lombok, NTB (Hiden, at.al, 2020). Harefa (2018) on the effectiveness of the gasing physics method on physics learning outcomes reviewed from student attention (experiment on class VII students of SMP Gita Kirtti 2 Jakarta.

This research aimed to evaluate the impact of the Fisika Gasing method, which utilizes spinning tops to illustrate physical phenomena, on enhancing kinematics understanding and student satisfaction among biology education students at Mataram University.

RESEARCH METHODS

This study employed a post-test-only design to assess the effectiveness of the Fisika Gasing method. A total of 25 biology education students enrolled in a kinematics course at the Faculty of Teacher and Education at Mataram University participated in the research. All students received instruction using the Fisika Gasing method, which involved hands-on activities and experiments with spinning tops to explore various kinematic principles. The Fisika Gasing method involved the following key elements: Introduction of the spinning top as a model to visualize and understand physical concepts. Hands-on activities and experiments using spinning tops to explore various kinematic principles, including motion types, velocity, acceleration, and forces. Group discussions and collaborative problem-solving tasks related to the experiments.

Data collection consisted of: A post-test administered after the intervention to measure students' understanding of kinematics concepts. An 8-item questionnaire administered after the intervention to assess student satisfaction with the Fisika Gasing method.

The questionnaire addressed aspects such as: Level of enjoyment and engagement experienced during learning. Perceived ease of understanding concepts with the Fisika Gasing method. Motivation and confidence in learning kinematics. Overall satisfaction with the method.

RESULTS AND DISCUSSION

Results

Post test results on Kinematics over students who has follow Fisika Gasing method is as follows figure 2. The analysis of post-test results revealed a significant improvement in kinematics understanding among the students. This suggests that the Fisika Gasing method effectively enhanced their grasp of key concepts. The data from the student satisfaction questionnaire also showed positive outcomes: Students reported high levels of enjoyment and engagement during the Fisika Gasing activities.

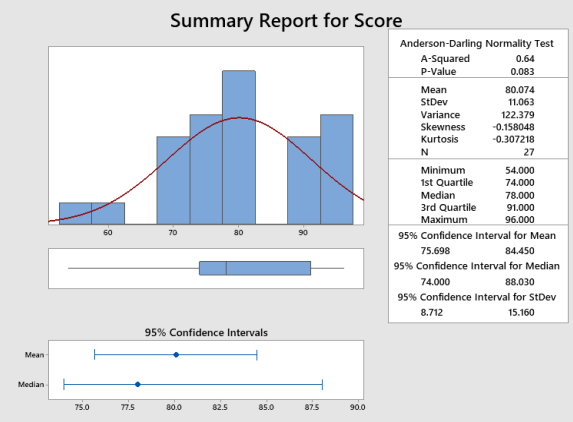

Figure 2. Histogram Score Kinematics

They perceived the method as an effective tool for facilitating their understanding of kinematics concepts. They expressed increased motivation and confidence in learning kinematics through the Fisika Gasing method. Overall, students indicated high satisfaction with the Fisika Gasing method.

Questions to determine the level of satisfaction with gasing among students taking basic physics kinematics material as in table 1.

Table 1. Question and Percentage of Fisika Gasing Satisfaction

No.	Question	Percentage
1.	How much fun is learning physics using the Gasing Physics method compared to conventional methods?	88
2.	How easily do you understand physics concepts using the Gasing Physics method?	93
3.	How interested are you in studying physics using the Physics Tops method?	96

No.	Question	Percentage
4.	Seberapa aktif Anda dalam pembelajaran fisika dengan metode Fisika Gasing?	92
5	How confident are you in working on physics problems after using the Gasing Physics method?	96
6	Do you feel more motivated to study physics using the Physics Tops method?	96
7	Would you recommend the Top Physics method to your friends?	96
8	How satisfied are you overall with the Gasing Physics method?	92

Discussion

Based on the provided scores, here is an analysis of the students' performance in the kinematics course: Descriptive Statistics: Minimum score: 54 Maximum score: 96 Mean score: 79.08 Median score: 78.00 Standard deviation: 11.20 Range: 42

Overall Performance: The average score of 79.08 suggests that the students achieved a good understanding of the kinematics concepts covered in the course. However, there is a considerable range of scores, indicating variation in individual performance.

Distribution of Scores: High Scores (above 90): 7 students (28%) achieved scores above 90, demonstrating a strong grasp of the material. Average Scores (70-89): 16 students (64%) scored between 70 and 89, indicating a good understanding of the key concepts. Low Scores (below 70): 2 students (8%) scored below 70, suggesting possible difficulties in comprehending the material.

Interpretation: The majority of students (92%) achieved scores above 70, indicating that the Fisika Gasing method was effective in facilitating their learning. The presence of high-performing students suggests that the method has the potential to foster deep understanding and mastery of complex concepts.

However, the low scores of some students indicate a need for further support or differentiated instruction to ensure that all students can achieve their full potential.

Recommendations: To address the range in individual performance, future studies could investigate the factors influencing student success in the Fisika Gasing method. This may include prior knowledge, learning styles, and study habits. Providing additional support for students who are struggling could involve offering individualized feedback, peer tutoring opportunities, or differentiated learning activities. Further research could explore the applicability of the Fisika Gasing method to different learning contexts and student populations.

Additional Notes: It is important to consider the context of the assessment when interpreting the scores. The difficulty level of the test, the time allowed for completion, and the scoring rubric all influence the final results. For a more comprehensive understanding of student learning, additional data points beyond post-test scores, such as pre-test scores, observations, and student feedback, would be valuable.

By analyzing these results and implementing the recommendations, educators can enhance the effectiveness of the Fisika Gasing method and ensure that all students have the opportunity to succeed in their study of kinematics.

CONCLUSION

The Fisika Gasing method demonstrated effectiveness in enhancing students' understanding of kinematics concepts, as evidenced by the average score of 79.08 and the high proportion of students

achieving satisfactory scores. The majority of students reported positive experiences with the method, indicating its potential for fostering engagement and improving learning outcomes.

However, the range of scores highlights the need for further investigation into factors influencing individual performance and for providing differentiated support for students who may be struggling. Additionally, incorporating pre-test scores and other data points would provide a more comprehensive picture of student learning and inform future improvements to the method.

Overall, the Fisika Gasing method presents a promising alternative to traditional teaching methods for kinematics instruction. By addressing the identified limitations and tailoring the approach to individual needs, this method can further contribute to enhancing science education and fostering a deeper understanding of fundamental physical concepts.

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