

## Analysis of the Use of Medume Boards for Learning in Elementary Schools on Data Processing Material

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### ABSTRACT

*This research aims to examine the effect of using Medume board media on increasing fourth grade elementary school students' understanding of data processing material. Medume Board, a visual-based learning aid, is designed to make it easier for students to understand the concepts of mean, mode, and median. The method used in this research is descriptive qualitative with data collection techniques through literature studies from various sources, such as books, journals and scientific articles. This research shows that using the Medume board can improve students' abilities in processing and analyzing data through interactive and concrete visualization. In addition, Medume boards are also effective in increasing students' active participation, development of analytical skills, and learning motivation. The research results are expected to contribute to the development of innovative learning media in the field of basic mathematics, especially in data processing material. Medume boards not only act as visual aids, but also as tools that support the development of critical thinking and problem solving skills. By utilizing simple but effective data visualization, students can more easily understand basic statistical concepts. In addition, this research illustrates that the integration of visual media such as Medume boards into the learning process can serve as a model for other teaching methods in subjects that require an understanding of abstract concepts.*

**Keywords:** Learning, Data Processing, MEDUME Board

### A. INTRODUCTION

Mathematics constitutes an essential component of the curriculum in elementary educational institutions, serving as a fundamental subject that all students are required to engage with during their formative years. The process of acquiring mathematical knowledge during this crucial stage has a significant and beneficial impact on the overall development and progress of a nation, as it lays the groundwork for future generations to thrive in a variety of disciplines. The Ministry of National Education of the Republic of Indonesia, commonly referred to as Depdikens, firmly believes that the educational experience centered around learning mathematics equips students with vital competencies that encompass logical reasoning, analytical skills, systematic thinking, as well as fostering creativity (BSNP, 2006). Additionally, the Ministry of Education emphasizes that the primary objective of imparting mathematical knowledge at the elementary level is to ensure that students develop a comprehensive understanding of mathematical concepts. It is anticipated that students will be able to articulate the interconnections between various mathematical topics, effectively employ appropriate methodologies to address problem-solving scenarios, grasp underlying patterns and attributes, apply mathematical principles in reporting contexts, and coherently explain mathematical ideas (BSNP, 2006).

Mathematics is a sophisticated discipline that intricately connects various concepts, as outlined by Nurhasanah, Kusumah, and Sabandar in their 2017 publication. The capability of students to comprehend mathematical concepts extends beyond mere recognition of the specific material they have encountered; it also includes the ability to articulate these concepts in alternative forms that remain accessible and comprehensible to others. Furthermore, students should be equipped to formulate informed opinions, as well as demonstrate proficiency in applying the material along with its cognitive framework in practical scenarios (Ulia, 2015; Istiha Psarri, 2017). The interrelated nature of mathematical

learning concepts is crucial, as when students engage with one concept, they inherently need to familiarize themselves with another, creating a state known as mathematical relationships. This phenomenon underscores the importance of students' abilities to draw connections between different mathematical ideas.

Consequently, it is imperative for educators to possess the skills necessary to design and implement effective learning plans that are well-structured and targeted, enabling learners to acquire holistic insights that render their educational experiences meaningful and impactful. Upon conducting observations, the author has noted that the level of comprehension among students at Negeri Kepatihan Primary School regarding the subject of mathematics is not particularly satisfactory, as evidenced by their limited competence in problem-solving tasks. This observation is particularly pronounced in relation to the specific concept of data processing, where students face numerous challenges, such as: 1) learners struggling to process information (data) effectively and to present this data in organized formats such as tables and diagrams; 2) learners exhibiting difficulties in analyzing the results of their data processing activities, which ultimately hinders their overall mathematical understanding and capabilities.

## **B. METHODS**

In the course of this comprehensive study, the authors employed a methodological framework characterized by a descriptive qualitative approach, in which a wide array of data was meticulously gathered through an extensive examination of various journals and scholarly articles that served as fundamental references, as well as additional supplementary information that enriched the research. The techniques utilized for data collection involved a thorough search and critical review of literature sourced from diverse materials, including but not limited to books, peer-reviewed scientific journals, pertinent articles, and a multitude of other relevant documents that contributed to the depth and breadth of the inquiry. Within the context of this study, various articles were utilized, which were subsequently subjected to rigorous analysis and systematic processing to distill valuable insights. Broadly speaking, the overarching purpose of this literary exploration is to address and resolve specific problems by undertaking a thorough examination of previously published writings and existing knowledge in the field.

The findings derived from this analytical process are anticipated to yield a more profound comprehension of the evolution and effectiveness of media-based learning tools, particularly those centered around the MEDUME board, which has been identified as particularly advantageous for primary school learners, specifically those in the fourth grade of primary education. Ultimately, the insights gained from this research endeavor are expected to inform and enhance educational practices, fostering an environment that is conducive to the learning needs of young students in an increasingly digital age. In conclusion, the implications of this study resonate beyond mere academic inquiry, aiming to contribute significantly to the ongoing discourse surrounding innovative educational methodologies.

## **C. RESULTS AND DISCUSSION**

Data processing is the process of collecting, organizing, analyzing, and presenting information that has been obtained to make it easier to understand and use. In elementary school materials, data processing often involves activities such as recording observations, grouping data by specific categories, calculating sums or averages, and presenting data in the form of tables, graphs, or diagrams. For example, if students conduct a survey about the

hobbies that their classmates like the most, the data collected will be processed by counting how many students chose each hobby, grouping the hobbies, and then presenting them in a more understandable form such as a bar chart. With data processing, students can see certain patterns or trends, which helps them to make conclusions or decisions based on the data that has been collected. Information is the result of certain data processing that is meaningful and can be used to make decisions about a company:

1. Presenting Data Using Tables and Lists A table is a collection of data organized neatly by rows and columns. Presenting and processing data in this form is generally used for single data or data that has a range of values or a large amount of data. The following are examples of data presentation in the form of tables and lists.
2. Presenting Data in the Form of Diagrams Diagrams or graphs are a way of presenting data in the form of images that can make it easier for us to read and interpret the data. There are several forms of diagrams, ranging from picture diagrams, bar charts, line charts, and pie charts.

#### Definition of Data Processing According to Experts

1. Rohman (2020) states that data processing in primary schools includes steps such as collecting, classifying, analyzing and presenting data. This process helps students understand how data can be processed and interpreted in the form of graphs, tables, and diagrams to make it easier to draw conclusions and make decisions.
2. Sulistyaningrum, Vera, and Murdiyasa (2021) emphasized that data processing in elementary school is important to avoid students' misconceptions in understanding basic statistical concepts. They mentioned that through data processing, students can recognize concepts such as mean, mode, and median, and how data can be used to see trends and patterns.
3. Safitri and Wahyuni (2019) explained that data processing in elementary school is the basis of mathematics learning that helps students understand the importance of organizing and presenting data in visual forms such as bar or pie charts. It aims to enable students to develop critical and analytical thinking skills.
4. Wulandari (2022) defines data processing in primary school as the process of engaging students in analyzing data from their daily activities, for example class surveys or simple observations, and presenting the results in the form of graphs or tables. This is considered important in connecting math learning with the real world.
5. Putri and Purnomo (2023) added that data processing at the primary school level provides students with a basic understanding of statistics, helps them present data in a form that can be well understood, while developing analytical and problem solving skills early on.

#### Explanation of the MEDUME board

Medume board is a learning media or learning tool designed to facilitate students' understanding of the concepts of Mean, Mode, and Median in statistics. The name "Medume" itself is an acronym for the three concepts. This board usually consists of visual elements, such as tables, graphs, or numbers that can be manipulated by students to calculate and understand how to find the mean, mode, and median values of a data set. With this tool, students can see and interact directly with the data they are learning, so that abstract concepts become more concrete. The use of Medume boards in the classroom is very beneficial, especially in mathematics learning, because it allows students to more easily understand and analyze data systematically, and increases active involvement in the learning process. In addition, Medume boards also encourage more practical and collaborative learning. Students can work in groups to organize data, discuss how to

calculate mean, mode and median, and compare their results with each other. That way, not only cognitive aspects are developed, but also social skills and cooperation. In its application, teachers can give real data analysis tasks, such as daily temperature data or class test results, to be processed using the Medume board.

Another advantage of the Medume board is its ability to help students overcome difficulties in understanding abstract concepts through visualization. For students who are more inclined to visual or kinesthetic learning, this media provides an opportunity to be more involved and understand the material more deeply. With this board, concepts such as the spread of data or the concentration of data at a certain point (mode) can be clearly seen and understood by students. Ultimately, the use of the Medume board not only helps students better master the statistical material, but also develops critical and analytical thinking skills, which are essential in various subjects and everyday life.

The effectiveness of using MEDUME boards for learning The use of Medume boards in primary school learning has been proven to be effective in improving students' understanding of data processing materials. Here are some reasons why Medume boards are effective in learning:

1. **Visualization of Abstract Concepts:** Data processing material, such as calculating mean, mode, and median, is often difficult to understand because it is abstract. Medume boards help present data in a visual form that can be manipulated, so students can more easily understand these concepts.
2. **Active and Participatory Learning:** Medume boards encourage students to actively participate in the learning process. They can interact directly with the data presented on the board, such as arranging the numbers, comparing the data, and calculating the results directly. This interactive learning makes students more engaged, resulting in increased understanding of the material.
3. **Analytical Skills Development:** Using the Medume board, students are trained to analyze data systematically. They are encouraged to find patterns, identify the highest and lowest values, and calculate the average independently. This enhances critical and analytical thinking skills that are important in data processing.
4. **Increases Learning Motivation:** Because it is interactive and allows students to manipulate data themselves, the Medume board makes learning more fun. Thus, students' motivation to learn data processing material is higher compared to conventional methods that only focus on teacher or textbook explanations.
5. **Collaboration and Discussion:** Medume boards can be used in group learning activities, where students can discuss and work together in solving data processing problems. This interaction not only strengthens students' understanding, but also trains their ability to work together and communicate.
6. **Improved Conceptual Understanding:** Students can see how changes in data affect the results of calculating the mean, mode, and median directly on the board. Thus, they gain a deeper understanding of how these concepts work and why they are important in data analysis.

Overall, the effectiveness of the Medume board in data processing learning in primary school lies in its ability to make learning more visual, interactive and collaborative, which helps students understand the material better and improve their analytical skills.

#### **D. CONCLUSION**

This study successfully showed that Medume board media has a positive impact on improving the understanding of grade IV elementary school students in data processing material, especially on the concepts of mean, mode, and median. By using this visual-based tool, students can more easily understand abstract concepts that were previously difficult to understand. Medume boards allow students to manipulate data directly, so they can see how changes in data affect statistical calculations. This makes learning more interactive and engaging, which in turn increases students' motivation in learning.

In addition, the use of Medume boards is not only effective in improving students' understanding of statistical concepts, but also in developing analytical and critical thinking skills. Students are trained to analyze data, find patterns, and make conclusions based on the data they process. Learning involving Medume boards also provides room for collaboration between students, so in addition to improving cognitive skills, it also contributes to the development of social skills such as communication and cooperation. Overall, the Medume board is an innovative and useful learning tool in learning basic mathematics.

#### **E. SARAN**

Based on the results of this study, it is recommended that teachers more often use Medume board media in learning mathematics, especially in data processing materials involving the concepts of mean, mode, and median. The use of this media is proven to be able to facilitate students' understanding of abstract concepts through concrete and interactive visualization. In addition, teachers also need to integrate Medume boards with group-based learning methods to encourage student collaboration and develop their social and analytical skills. Special training for teachers on how to optimally use the Medume board is also important so that this media can be applied effectively and in accordance with the learning objectives. In the future, the use of this medium could be extended to other materials in mathematics or other subjects that require a similar approach to understanding abstract concepts. Further research on the effectiveness of the Medume board in a long-term learning context is also recommended, so that its benefits can be continuously improved.

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