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The Use of Visual Media: Improving the Understanding of Data Presentation and Graphs of Students of SD Negeri Gurawan Elementary School

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Abstract

Penelitian ini bertujuan untuk mendeskripsikan pemanfaatan media visual dalam meningkatkan pemahaman siswa kelas V pada materi penyajian data dan grafik di SD Negeri Gurawan. Rendahnya hasil Asesmen Nasional (AN) dan tinjauan PISA menunjukkan lemahnya kemampuan literasi dan numerasi siswa Indonesia. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan teknik pengumpulan data melalui observasi, wawancara, dan dokumentasi. Subjek penelitian terdiri dari guru dan siswa kelas V sebagai sumber data primer, sedangkan referensi ilmiah dan jurnal digunakan sebagai data sekunder. Hasil penelitian menunjukkan bahwa penggunaan media visual seperti gambar dan ilustrasi, diagram berwarna, alat peraga konkret, serta media digital seperti Canva dan video animasi sangat efektif untuk meningkatkan pemahaman siswa dalam penyajian data. Media tersebut membantu siswa membangun hubungan antara pengalaman konkret dan konsep abstrak, memfasilitasi klasifikasi data, serta menumbuhkan minat dan partisipasi aktif dalam pembelajaran. Penerapan media visual juga terbukti dapat meningkatkan kemampuan menginterpretasikan grafik dan mendorong kolaborasi antar siswa. Hasil penelitian ini memperkuat teori Bruner tentang tahapan belajar dan mendukung pandangan bahwa media visual dapat meningkatkan efektivitas proses belajar-mengajar. Penelitian ini menyimpulkan bahwa media visual merupakan salah satu solusi strategis dalam memperkuat kemampuan berhitung siswa dan menyarankan para guru untuk mengintegrasikan media visual ke dalam proses belajar mengajar.

Keywords : Media Visual; Pemahaman; Presentasi Data dan Grafik

Abstract

This study aims to describe the utilisation of visual media in improving grade V students' understanding of data and graph presentation material at SD Negeri Gurawan. The low results of the National Assessment (AN) and the review of PISA show the weak literacy and numeracy skills of Indonesian students. This study used a descriptive qualitative approach with data collection techniques through observation, interviews, and

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documentation. The research subjects consisted of grade V teachers and students as primary data sources, while scientific references and journals were used as secondary data. The results showed that the use of visual media such as pictures and illustrations, coloured diagrams, concrete props, as well as digital media such as Canva and animated videos was very effective in improving students' understanding of data presentation. The media helps students build connections between concrete experiences and abstract concepts, facilitate data classification, and foster interest and active participation in learning. The application of visual media is also proven to improve the ability to interpret graphs and encourage collaboration between students. These results reinforce Bruner's theory of the stages of learning and support the view that visual media can improve the effectiveness of the teaching-learning process. This study concludes that visual media is one of the strategic solutions in strengthening students' numeracy and advises teachers to integrate visual media into the teaching and learning process.
***Keywords**: Visual Media; Comprehension; Data and Graph Presentation.*

INTRODUCTION

The Indonesian government continues to improve the quality of education through various policies, including curriculum reform and adjustments to learning strategies (Kusuma, Hamidah, Umalihayati, & Rini, 2024). Although access to education has expanded, challenges in improving the quality of learning outcomes are still very real (Dahyanti, Diastami, Humaira, & Darmansah, 2025; Iqbal & Ahmad, 2010). The results of global evaluations such as the Programme for International Student Assessment (PISA) show that Indonesia's education quality has not improved significantly over the past two decades (OECD, 2019; Wardani, Haryani, Prasetya, L, & Septiaseh, 2022). In addition, the revealed a gap in education quality between regions in Indonesia, signalling the need for more innovative and equitable learning strategies.

One of the government's concrete efforts to address the gap in education quality and improve student learning outcomes is by implementing the Merdeka Curriculum (Budiono & Hatip, 2023; Hadi, Ngindana, Kurdi, Sulaiman, & Fauziah, 2023). This curriculum is designed with an emphasis on strengthening basic competencies such as literacy, numeracy, and character. This focus aims to equip students with the foundational skills needed in 21st century life, as well as bridge the learning gap that still occurs in various regions of Indonesia. In its implementation, Merdeka Curriculum requires teachers to not only teach, but also carry out various administrative tasks and lesson planning. Teachers are required to develop lesson plans, conduct assessments, and align the curriculum with school needs (Fatmawati, 2021; Hazmi, 2019). However, the main challenge remains on how to convey complex learning materials, such as mathematics, in a way that is easy for students to understand, one of which is by utilising interactive visual media.

Numeracy literacy is an important aspect of the Merdeka Curriculum because it is directly related to students' ability to analyse and interpret data. Numeracy literacy is not

limited to calculations alone, but includes the ability to understand information in the form of graphs, tables, and diagrams, and use this information to make decisions (Ekowati, Astuti, Utami, Mukhlisahina, & Suwandayani, 2019; Lestari & Siswono, 2022). These skills are very important in everyday life and contribute greatly to students' learning outcomes in general. Students who have good numeracy literacy tend to understand mathematical concepts more easily, including data presentation and graphs. Conversely, students with low numeracy literacy skills will have difficulty in understanding basic statistical materials. Therefore, learning mathematics, especially data presentation material, requires a more effective and interesting learning strategy so that students can more easily absorb the information presented.

The use of visual media is one solution to improve students' understanding of data and graph presentation material (Ismawati & Hidayati, 2022). Data visualisation in the form of bar graphs, pie charts, or infographics helps students make sense of information presented abstractly. With the help of visual media, students can develop analytical and interpretative thinking skills that are needed in understanding quantitative data. Based on observations and interviews conducted in Class V of SD Negeri Gurawan, various problems were found in learning mathematics. Teachers still rely on the lecture method and textbooks, the use of teaching aids is minimal, and students tend to be passive and lack motivation (Soffanah Dina Pratiwi, 2022). This has an impact on students' low understanding of data presentation and graph material.

In learning practice, students still have difficulty understanding bar graphs and drawing conclusions from the data presented. Learning tends to be individualised without involving group work, so interaction between students is limited (Yuan, 2024; Zabatiero et al., 2024). This shows the need to use learning media that can attract students' attention and help them understand the material better. One of the visual media that can be utilised to overcome these problems is Canva. Canva is an online graphic design application that is easy to use, provides various attractive templates, and can be accessed for free (Pedroso, RV S. SULLEZA, Keith Hae Moon C. FRANCISCO, Ayya Jade O. NOMAN, & Chynna Althea V. MARTINEZ, 2023; Safira, Laksmi, Az-zahra, & Aisha, 2024). This application allows teachers to create visual materials such as infographics, graphs and posters that support mathematics learning, especially data presentation.

The use of Canva in learning allows teachers to present materials in a more dynamic and easy-to-understand format. Canva also provides various animation and graphic design options that can increase students' interest and motivation to learn (Melinia & Nugroho, 2022; Sa`adah, Istiqomah, & Suhartono, 2024). With this media, learning is not only more interesting, but also more effective in conveying abstract messages or concepts. The results show that the use of visual-based learning media such as Canva can improve student learning outcomes, especially in materials that require visual understanding such as data presentation. It also helps students with visual learning

styles understand the material better. Student interaction also increases because the material displayed is more communicative and visually appealing.

By utilising technology and visual media such as Canva, teachers can improve the quality of mathematics learning, especially in terms of understanding data presentation and graphics. This effort is in line with the demands of 21st century learning which emphasises the importance of technology integration in education. Therefore, the use of visual media should be part of the learning strategies that teachers implement to improve students' overall understanding of concepts and numeracy competencies.

METHOD

This research uses a qualitative approach with the aim of exploring research more deeply (Larsen et al., 2024). Data were collected through three methods, interviews, observation, and documentation, to obtain valid and reliable data, researchers triangulated methods as a data collection and analysis technique, triangulation is a data validity checking technique by utilising data validity checks using different methods (Pahleviannur et al., 2023). While in deepening the data obtained, researchers used two kinds of data sources, namely primary data and secondary data, primary data were obtained directly from research subjects when conducting interviews, observations, and documentation, while secondary data were obtained from information found in various journals. To ensure the truth of the information, researchers also used triangulation of data sources from interviews, archives, documents, observation results, and related research articles (Alfansyur & Mariyani, 2020).

The sampling process was carried out using purposive sampling technique, this technique is done by taking subjects based on specific objectives, not randomly or based on strata Sugiyono, (2019)the basis for using this technique is so that the data obtained is directed and meets scientific requirements. Data analysis uses four stages from Miles and Huberman starting from data collection, simplifying data by being reduced, presenting data, and interpreting data with conclusions (Mustafa, Gusdiyanto, Victoria, & Masgumelar, 2022). By using this approach, it is expected that the research can produce the use of visual media in improving the understanding of data presentation and graphs in elementary school students.

RESULTS AND DISCUSSION

Results

Based on the results conducted at SD Negeri Gurawan on the research on the use of visual media in improving students' understanding of data presentation and graphs, there are several results, namely:

Pictures and Illustrations

The initial strategy carried out at SD Negeri Gurawan in using visual media to improve understanding of data presentation and graphics in students is pictures and illustrations. These images or illustrations aim to help students understand the concept of data in a concrete and fun way and increase students' interest in learning observation skills and simple analysis skills. In addition, with these images and illustrations, students are able to compile and read graphs with confidence, where students are directly involved in the process of making data from the initial stage. Based on an interview with the class teacher, it is explained as follows:

"*Yes, with these pictures and illustrations learners are given the opportunity to observe and classify objects based on certain categories, for example tables, chairs, blackboards, pencils and those around the school. From the results of observations and groupings, students present them in the form of bar graphs or visual images."*

Through these images and illustrations, learners are more accustomed to understanding gradually and contextually. Therefore, learners are not only trained in the ability to calculate and compile data, but also build students' understanding of the concept of comparison and data visualisation. So that the learning process is more enjoyable because learners are directly involved both visually and kinesthetically.

Colourful diagrams and graphs

The use of colourful diagrams and graphs is very effective in helping learners understand the concept of data presentation because interesting visualisations can make it easier for students to distinguish information. The use of these colourful diagrams and graphs, teachers and learners make use of various kinds of origami paper, highlighters, or other digital media (powerpoint or graph-making applications) that can distinguish from various kinds of data. Based on the interview with the class teacher, it is explained as follows:

"The impact is very positive. Not only are students able to understand the material more easily but they are also able to develop their data analysis skills, logical thinking, and creativity. With this, students in learning activities become more lively and interesting because students are able to make data tables and arrange them in the form of bar and pie charts by utilising existing tools. In addition, students are also able to explain related to interactive graphics in digital media. Therefore, it is more effective than just listening to the teacher's explanation."

Colourful diagrams and graphs provide opportunities for students to understand, exercise creativity and explore the ability to think related to visual media for learning mathematics in the presentation of data and graphs. In addition, learning activities through visual media, especially on diagrams and colourful graphs, students are faster in recognizing data patterns, comparing amounts, and understanding the contents of the graph. With this, students can become school citizens who have logical and creative thinking.

Concrete Props

Another use of visual media is concrete props. The props used in learning data presentation and graphs are colour blocks, buttons, eksrim sticks, beads or bottle caps. Through these props, it will help students understand data collection and data presentation gradually. The purpose of this concrete props is to connect abstract concepts with students' real experiences. The teacher in this activity helps the process of compiling data, grouping, and presenting data in an easier and more fun graphic form.
Concrete props are the implementation stage of visual media. In this activity, students are divided into several small groups, then divided into props in the form of colour blocks with different numbers and colours. Each group is then asked to group the blocks by colour or size, and record the number. The results of the grouping were then presented in the form of a bar chart drawn on the cardboard provided. The results of using visual media concrete props can train students to be active, increase self-confidence and strengthen the skills of calculating, clarifying and presenting data with visual information. So that students are able to make good decisions from these group activities.

"*At this stage, students are given the opportunity to present what they have done in their groups. Then the results of the presentation are posted on the class madding board which will be read by other friends."*

The use of visual media is a new breakthrough for schools to not only memorise the concept of data presentation, but to actually experience and understand the process from start to finish. This activity is carried out by SD Negeri Gurawan as a form of improving understanding of data presentation and graphs in learning Mathematics. Learning mathematics using these teaching aids affects students to be more interactive, interesting and meaningful in accordance with the characteristics of students who tend to learn through direct experience.

Powerpoint and Video Animation

The use of powerpoint and animated videos in presenting data is a form of technology integration that can increase student interest in learning and facilitate visual understanding. Through the use of powerpoint and animated videos, teachers utilise interactive presentation slides and educational animated videos to explain the steps in compiling data, creating tables, and converting data into graphic diagrams (bars, circles and lines). Through learning using powerpoint and animated videos, the aim is to increase students' concentration and interest in the material, show the process of presenting data dynamically, and provide visual and auditive learning experiences in accordance with the learning styles of elementary school students.

"Technology provides many benefits in learning mathematics. Through powerpoint and animated videos in presenting data at SD Negeri Gurawan, it provides opportunities for

students to understand and engage. For example, in learning mathematics, this visual display makes students more focused, enthusiastic, and easy to understand the concept of changing data from tables to graphs. This makes learning more effective and encourages students to think logically because students can observe and apply in independent practice. So that students can learn according to their learning style and interact with existing technology."

The impact of using visual media in learning mathematics with powerpoint and animated videos is that students can discuss and answer questions about the video so that the teacher can measure students' understanding. This is evidenced by students being able to make graphs based on the data in the worksheet. With the use of powerpoint and animated videos, students are more enthusiastic, easier to understand the steps of presenting data, and more confident in making graphs. This makes learning more modern, relevant and effective in building understanding among primary school students. This is evidenced by the results of using visual media in learning mathematics.

Table 1. Research Results
Use of Visual Media in Learning Maths

No	Visual Media	Findings from Observations and Interviews	Indicators of Increased Understanding
1	Pictures and Ilustration	Students are able to classify data from pictures and present them with the help of the teacher.	Classification understanding improved, students began to be able to organize data.
2	Colorful Diagrams and Graphics	Student-made graphs are neater and more meaningful, students are enthusiastic about coloring and adjusting the data.	Students can differentiate categorical data, read graphs by themselves
3	Concrete Props	Practical activities with ice cream sticks and buttons help students understand the amount and comparison of data.	Students understand the steps from collection to graphing.
4	Powerpoint and Video Animation	Students are more focused and understand the process of presenting data gradually through visual displays.	Visualization supports the understanding of table and graph concepts.

Through the use of visual media in learning Mathematics applied at SD Negeri Gurawan, students are more active in understanding the various visual media used by the

teacher, so that this media makes learning more effective and meaningful, fun which is able to bridge student thinking from concrete to abstract. This shows that visual media can strengthen and improve students' understanding in learning data presentation and graphics, especially at the elementary school level.

Discussion

The use of visual media in learning mathematics, especially in the presentation of data and graphs, has a positive impact on improving student understanding. Based on research conducted at SD Negeri Gurawan, visual media such as pictures, illustrations, colorful diagrams, concrete props, to powerpoints and animated videos have proven to be able to build students' understanding gradually from concrete to abstract. This is in accordance with (Pande, 2021; Pohjannoro, 2022)view in his theory of gradual learning (enactive-iconic-symbolic), where visual media becomes a link between real experiences and abstract concepts.

The strategy of using pictures and illustrations has a positive effect in the early stages of learning. With the help of visualization of objects around students, the data classification process becomes more meaningful. According to research by (Mahayukti, Dianawati, Ardana, & Suryawan, 2019)picture media can improve students' memory and reasoning power due to the presentation of concrete information. In addition, students are more enthusiastic in observing and classifying data because they feel directly involved in learning activities. The use of colorful diagrams and graphs encourages students to better understand the differences in data categories, recognize patterns, and read information from graphs better. Research by (Midway, 2020) shows that color in graphs and data visualization is very effective for increasing student attractiveness and understanding, especially at primary school age which is still in the visual and cognitive development stage. Students at SD Negeri Gurawan show great enthusiasm in using tools such as color paper, highlighters, and digital applications.

Concrete props such as color blocks, ice cream sticks, buttons, and beads become a form of visual media that is very helpful in bridging student understanding from the data collection process to its presentation in the graph. This is in line with (Dwi Wicaksono, Pandu Paksi, & Supriyono, 2023)which state that concrete props make it easier for students to understand mathematical concepts because they can touch, classify, and see the data collected directly. In the research at SD Negeri Gurawan, group activities with props trained students' cooperation, confidence, and presentation skills. The use of powerpoint and animated videos is also a modern learning solution that supports students' various learning styles, especially visual and auditory. According to (Urba, Ramadhani, Afriani, & Suryanda, 2024; Zahroh, Apriyani, & Afrilia, 2025), audiovisual media can present information in the form of movement, sound, and color that enriches students' learning experience. In the context of this research, the use of interactive slides

and videos helps students understand the flow of data presentation more coherently, interestingly, and in the context of their lives.

Overall, this visual media approach provides an active, meaningful and fun learning experience for primary school students. Students are not only recipients of information, but also producers of data which they then present back in visual form. This is in accordance with the constructivistic approach to learning, where students build their own understanding through interaction with media and the learning environment. The research at SD Negeri Gurawan is reinforced by a study from (Azizah & Mardiana, 2024) which shows that visual media increases student learning activeness and provides a better understanding of the concept of data presentation. In addition, findings from (Piedra & Reascos, 2024) also confirmed that audiovisual media such as videos and animations are very effective in learning mathematics because they can increase students' focus, participation and understanding of the material.

The application of visual media also has positive social and emotional impacts. Students become more confident in conveying their observations and presenting data. Group discussion activities, presentation of work results, and posting graphs on the class mading encourage healthy social interactions, increase the sense of ownership of work results, and foster a sense of responsibility and cooperation. This supports the 21st century education goals that emphasize not only cognitive but also social and collaborative skills.

CONCLUSION

Research conducted at SD Negeri Gurawan showed that the use of visual media in learning mathematics, especially the presentation of data and graphs, significantly improved students' understanding, engagement and enthusiasm. Through various media such as pictures, colorful diagrams, concrete props, to powerpoints and animated videos, students are guided gradually from concrete experiences to abstract understanding. This approach not only strengthens students' cognitive abilities in classifying, organizing, and reading data, but also fosters social skills, logical thinking, and self-confidence through collaborative activities and presentations. The successful implementation of this visual media emphasizes the importance of creative teachers as facilitators and the need for professional development support so that this visual learning strategy can be widely applied as an innovative and relevant good practice in elementary schools.

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