

Utilization of Visual Media Multiplication Smart Board in Mathematics Learning in Elementary School

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Abstract

This research uses the literature study method and is based on the opinion that elementary school students in both lower and higher grades believe that mathematics is the most difficult and frightening subject. This idea causes current mathematical practice to appear boring and rigid and does not suit the characteristics of elementary school students so student learning outcomes regarding mathematical calculations are not optimal. The research results show that the use of multiplication smart board visual media can overcome these statements so that mathematics learning will feel more concrete. Multiplication smart board media is a learning media that is included in the category of Educational Game Tools (APE), which is designed in the form of a board made of cardboard. The use of smart boards provides good benefits for the process of conveying information so that it is interesting and effective in the learning process.

Keywords: *Visual Media; Multiplication Smart Board; Mathematics Learning*

Abstrak

Penelitian ini menggunakan metode studi literatur dan dilatarbelakangi oleh siswa tingkat sekolah dasar baik di kelas rendah maupun kelas tinggi berpendapat bahwa matematika merupakan mata pelajaran yang paling sulit dan menakutkan. Gagasan ini menyebabkan praktik matematika saat ini tampak membosankan dan kakuserta tidak sesuai dengan karakteristik siswa sekolah dasar sehingga hasil belajar siswa mengenai perhitungan matematika pun tidak maksimal. Hasil penelitian menunjukkan bahwa pemanfaatan media visual papan pintar perkalian dapat mengatasi *statement* tersebut sehingga pembelajaran matematika akan terasa lebih konkret. Media papan pintar perkalian merupakan sebuah media pembelajaran yang termasuk dalam kategori Alat Permainan Edukatif (APE), yang dirancang dalam bentuk papan yang terbuat dari kertas karton. Penggunaan papan pintar memberikan manfaat yang baik terhadap proses penyampaian informasi agar menarik dan efektif dalam proses pembelajaran.

Keywords: *Media Visual; Papan Pintar Perkalian; Pembelajaran Matematika*

INTRODUCTION

As explained in the Constitution of the Republic of Indonesia Number 20 of 2003, the purpose of basic formal education is closely related to the realization of the functions and objectives of national education. Basic education aims to create a learning

environment where students remain active in the learning process. Primary school has an important role as a foundation for the development of children's various abilities, including their cognitive, affective, and psychomotor aspects. According to Binti Maunah in (Humaero et al., 2020) curricular objectives are one of the educational objectives that include the goals of the field of study or the objectives of each subject explained by the teacher. By achieving these learning goals, students' potential can be developed to have good character strength, spirituality, self-control, and morality, as well as abilities needed by individuals, society, and the country. Therefore, teachers in their role as teachers, are responsible for facilitating students in the learning process, creating an interesting learning environment by utilizing media, tools, models, teaching methods, and approaches that are in accordance with the material being taught. A person's level of education can be assessed based on the achievement of their learning outcomes, which reflects their level of seriousness in pursuing education through the learning process. This process involves the relationship between educators and students, both in school and outside of school (Syam, 2023).

Mathematics learning is a process that links the relationship between teachers and students, to stimulate creativity and improve students' academic achievement. The level of difficulty or ease in understanding mathematics can vary depending on the individual's perspective. This subject requires students to think logically, critically, and analytically in considering various (Hasanah & Sari, 2022). A mathematician named Carl Friedrich Gauss in (Nafisah & Furnamasari, 2023) revealed "Mathematics is the queen and servant of the sciences" which explains that mathematics is the queen and servant of science so that mathematics is an important foundation and tool for the progress of science in general. Thus, mathematics is a compulsory subject that is taught at all levels of education, including at the elementary school level.

Many pupils at the elementary level, both in the lower and upper grades, consider mathematics to be the most difficult and daunting subject to learn. This belief has implications for the perception that the current mathematics learning practice feels monotonous and less dynamic. The main reason is that elementary school-age children have concrete operational characteristics, which indicates that their learning approach must be concrete and real. The use of a relevant and appropriate learning environment has a great influence on learning outcomes. Research shows that one of the most effective ways to improve students' understanding of mathematics is through the use of images, illustrations, or conceptual models. Therefore, it is recommended that teachers take the initiative in creating learning media that are directly related to the subject matter being taught, which aims to attract the interest and attention of students (Hamid, 2023).

The mathematics subject matter found in the lower grades is multiplication. Multiplication is one of the four aspects of basic arithmetic operations. Heruman in (Afifah & Fitriawanawati, 2021) said that some students face difficulties in understanding the concept of multiplication. Teachers should use different methods to teach students how to multiply things to make them easy to understand. The process of counting by

multiplication is called matter, and students need to have an understanding of this process because it has important relevance in practical application to daily life. In addition, the use of media and aids in the learning process is seen as a factor in improving the quality of education as a whole, including in improving the quality of education in mathematics learning.

Educational media has an important role in facilitating the understanding and mastery of educational concepts. Daryanto in (Fitria, 2014) describes the media as part of the communication process, which helps convey messages from the sender to the receiver. Meanwhile, according to Sudjana and Rivai, the function of learning media is (a) a means to create interactive learning conditions, (b) an important component in the context of teaching as a whole, (c) using learning media needs to be adjusted to the material being taught, (d) learning media is not only as entertainment but as an important element in the teaching and learning process, (e) accelerating the learning process and helping students understand the concepts that explained by the teacher (Firdausy et al., 2023). The use of learning media is expected to give birth to vibrant interaction between teachers and students through the use of various tools related to learning media.

The learning process becomes less interesting if the use of media is not maximized by teachers in the teaching process. The results of the research conducted (Afifah & Fitriawanati, 2021) stated that the application of media-based learning can stimulate student learning motivation. Factors that cause students to have difficulty understanding mathematical concepts are that students cannot complete tasks on their own, lack of understanding needed to handle tasks, and lack of clarity in the explanation of the tasks. In addition, the lack of student involvement in the learning process is also a problem. This condition is caused by the incompatibility of learning media with the characteristics of students and shortcomings in the application of creative learning methods, especially in the context of the Industrial Revolution era. As a result, students' interest in learning decreases and boredom arises due to the lack of direct involvement of students in the learning process, especially in multiplication learning. This has the potential to affect students' academic achievement in understanding multiplication material.

Thus, to overcome the challenges in achieving students' mathematics learning outcomes, the use of multiplication smart boards can be an effective solution. Multiplication smart boards are one of the media that can be used in the learning process to convey information effectively. This media can also be applied to learning for children. The multiplication smart board has a rectangular shape with a variety of attractive colors, is equipped with number symbols, and is adjusted to the learning theme through the addition of two-dimensional object shapes. By using the multiplication smart board as a learning medium, it is hoped that children can understand and develop their ability to understand number symbols. In addition, learning activities that involve the use of a whiteboard can also increase children's concentration. The reason for using this medium at the primary education level is to help students understand the concept of multiplication from an early age, both conceptually and in the application of proper

calculation techniques because the ability to understand concepts is the most important thing in mathematics (Zuliani et al., 2023).

METHODS

This study uses a qualitative descriptive analysis method with a literature study approach that aims to describe the researcher's findings based on a study of several relevant sources. A literature study is a type of research used to collect data or sources related to the topic raised in the research. Data was obtained from several books and scientific journals related to the study studied. The following are the stages of literature study in this study, namely: (1) collecting literature data relevant to the research topic, (2) reading and recording literature sources, (3) analyzing and processing data, (4) making conclusions, (5) presenting literature reviews. The topic of this research discusses the use of multiplication smart board visual media in mathematics learning in elementary schools. The source of the article used was obtained through Sinta, Google Scholar, and Research Rabbit.

RESULTS AND DISCUSSION

One of the aspects of arithmetic operations in elementary school is multiplication. Multiplication plays an important role in improving students' understanding of the basic principles of mathematics. With mastery of multiplication, students can improve their skills in solving more complex math tasks in the future, while also improving their understanding of the interconnectedness between numbers. Thus, a strong understanding of multiplication is key to students' academic progress at the elementary level.

1. Results

The following are the results of studies from several national research journals related to the use of multiplication smart board media in mathematics learning in elementary schools. The following is a table to make it easier to analyze the Journal of the Use of Multiplication Smart Board Media in Mathematics Learning in Elementary Schools.

Table 1. Journal Analysis of the Use of Multiplication Smart Board Media in Mathematics Learning in Elementary Schools

No.	Source/Journal/Book	Journal Review/Book
1.	WASIS: Jurnal Ilmiah Pendidikan, Vol. 2 No. 1, Mei 2021, 41–47. https://doi.org/10.24176/wasis.v2i1.5785	Title: Development of Panlintarmatika Media (Mathematics Smart Multiplication Board) Multiplication Materials for Elementary School Students Writer: Hasna Nur Afifah, Meita Fitrianawati

		Results of the study: Smartboard media is worthy of use in mathematics learning. However, in the study, the multiplication smart board media was developed into a Mathematics Smart Multiplication Board (Panlintarmatika). The assessment of the feasibility of using the learning media of the mathematics smart multiplication board in learning multiplication material is based on the evaluation of media experts, material experts, and learning experts, as well as the responses of students and teachers to the quality of the media. The final results of the development of the Mathematics Smart Multiplication Board (Panlintarmatika) learning media show that this media belongs to the category of visual media, which includes various elements such as lines, shapes, colors, and textures in its delivery. Therefore, it can be concluded that the Panlintarmatika learning media is considered feasible and appropriate to be used in learning multiplication material in grade II of elementary school.
2.	Jurnal Ilmiah Pendidikan Profesi Guru Vol. 6 No. 2, 2023, 233-241, DOI: https://doi.org/10.23887/jippg.v6i2.63497.	Title: Smart Board Media Multiplication Materials in Early Mathematics Learning in Elementary Schools Writer: Wirna Rizqi & Nurdiana Siregar Results of the study: The use of smart board media based on the evaluation of expert validators, this media is considered very feasible, while the students' response to the media reaches a very good level of criteria. The effectiveness test

		of smart board media stated that the average learning outcome of students who used multiplication skill media was higher than the average learning outcome of students who did not use media. Thus, it can be concluded that this smart board media is effective, practical, and valid, and can be used as a mathematics learning medium in improving students' multiplication calculation operation skills
3.	Didaktik: Jurnal Ilmiah PGSD STKIP Subang, Vol. 8 No. 2, Desember 2022, 1222–1236. https://doi.org/10.36989/didaktik.v8i2.368	<i>Title:</i> Improvement of Multiplication Calculation Skills through the Use of Smart Multiplication Table Media (Takalintar) for Class III Students of UPT SD Negeri 182 Gresik <i>Writer:</i> Siti Rohmatul Hasanah & Arissona Dia Indah Sari <i>Results of the study:</i> Developing multiplication smart board media into Smart Multiplication Table (Takalintar), which is a learning medium consisting of tables made of boards and corks. The goal is to support the learning process and improve students' multiplication skills. Challenges faced during the implementation of learning include the limitation of Takalintar media which is only available once, causing students to have to use the media alternately during practice. In addition, when applying Takalintar in LKPD, students experienced difficulties in drawing Takalintar tables due to differences in colors and worksheet formats with more colorful Takalintar media. However, Takalintar has advantages in helping students hone multiplication skills,

		although the main drawback is the limited number of media that is only one, resulting in students having to use media in turns. So, this Takalintar media can be used for mathematics learning in elementary schools
4.	Didaktika: Jurnal Ilmiah PGSD STKIP Subang, Vol. 9 No. 5, Desember 2023, 323-332. https://doi.org/10.36989/didaktika.v9i5.1927	<i>Title:</i> Development of Smart Multiplication Board Learning Media Based on the Montessori Method for Grade III Elementary School <i>Writer:</i> Marisa Rahma Tusya'diah <i>Results of the study:</i> The use of smart multiplication board learning media stated by the researcher is qualified to be used in mathematics learning in grade III A SD Negeri 53 Prabumulih. Assessment based on validity, practicality, and effectiveness. The validity of the media was assessed by three experts, namely media experts and material experts, with an average score of 87% in the category of "very effective". The usefulness of the media was measured using a multiplication board based on the Montessori method, with an average score of 91.17% in the "very useful" category. Meanwhile, the level of media effectiveness is assessed based on the results of student learning tests, with an average score in the "very effective" category of 82.9%. It can be seen that the intelligent multiplication board learning media based on the Montessori teaching method is suitable for use by grade III elementary school students
5.	Masaliq: Jurnal Pendidikan dan Sains, Vol. 3 No. 5, Juli 2023, 870-879. https://doi.org/10.58578/masaliq.v3i5.1391	<i>Title:</i> Efforts to Improve Multiplication Learning Outcomes through PKP2 (Multiplication Smart Pocket

		Board) Media Class II SDN 3 Sepatan Writer: Rizki Zuliani, Agustini SafiTri, & Laily Yuniar Nur'Azizah Results of the study: PKP2 media (multiplication smart pocket board) is specifically designed to provide a unique learning atmosphere and aims to increase students' enthusiasm for learning multiplication. The media consists of a board made of styrofoam coated with cardboard, with the addition of a plastic cup as a place for sticks. Each stick container is lined with origami and given a number 1-10. The use of media or teaching aids, especially those related to daily life, is expected to increase the effectiveness and depth of learning because students can experience the concepts taught themselves
6.	Jurnal Literasi dan Pembelajaran Indonesia, Vol. 3 No. 2, November 2023, 96–100	<i>Title:</i> Improvement of Multiplication Learning Outcomes in Mathematics Subjects Using Smart Board Media in Class II of SDN 15 Mataram Authors: Vivilia Ananda, Baiq Mariana, & Nurul Kemala Dewi Results of the study: Multiplication smart board learning media has an important role in stimulating learning motivation, repeating the material that has been learned, providing stimulation for learning, activating student responses, providing feedback quickly, and encouraging consistent practice
7.	ALFIHRIS: Jurnal Inspirasi Pendidikan, Vol. 1 No. 3, Juli 2023 208–216. https://doi.org/10.59246/alfihris.v1i3.360	<i>Title:</i> Application of Smart Board Learning Media in Second Grade Mathematics Learning Uptd Sdn 1 Juntinyuat

		Author: Syifaun Nafisah & Yayang Furi Furnamasari Results of the study: This smart board media is very suitable to be used as a learning medium and can help the mathematics learning process. This can be seen from the results of observations and student responses which show that smart board media is very effective in learning mathematics in elementary schools
8.	Jurnal Penelitian Dan Pengembangan Pendidikan, Vol. 3 No. 1, Maret 2019, 26–30. https://doi.org/10.23887/jppp.v3i1.17097	<i>Title:</i> Development of Papin and Kaja Media (Smart Boards and Magic Boxes) as Mathematics Learning Media <i>Writer:</i> Rizki Zuliani, Agustini SafiTri, & Laily Yuniar Nur'Azizah Results of the study: The use of smart board media in mathematics learning has the feasibility to be applied, with an increase in learning outcomes of 61.5 in the first session and 79.2 in the second session.

2. Discussion

Learning media is a teaching tool that supports the teaching and learning process by conveying messages more clearly, to achieve learning or educational goals effectively and efficiently (Nurrita, 2018b). Learning media is divided into three categories, audio, visual, and audio-visual. Audio media refers to media that is captured through the sense of hearing, while visual media refers to media that can be seen. Meanwhile, audio-visual media is a media that combines these two aspects. One of the visual media used in mathematics learning is multiplication smart board media.

Smartboard media is a learning media that is included in the category of Educational Game Tools (APE), which is designed in the form of a board made of cardboard (Nafisah & Furnamasari, 2023). The use of this media is focused on the mathematics learning process, especially in the context of multiplication and division material. The main function of a smart board is to provide a means that makes the math learning process easier. The goal is to provide support and media that make the math learning process more enjoyable for students and teachers (Putri, 2022).

Based on several previous studies, the use of smart board visual media in learning provides good benefits for students and teachers. In addition to helping teachers explain

the material, visual media also has added value, namely in accordance with the concrete operational characteristics of elementary schools. This means that students will understand and absorb the material if they see the object directly so that the process of conveying information is interesting and effective in the learning process. In addition, the multiplication smart board is a visual medium that is very effective and practical in learning mathematics so it is suitable for use in improving the ability of multiplication operations for students in elementary schools.

CONCLUSION

The results of the review of several research articles above suggest that multiplication smart boards are included in the type of visual media. Visual media is a visible medium that has several elements namely: lines, shapes, colors, and textures in its presentation. The application of multiplication smart board media, can provide different nuances in learning where students play an active role and can arouse the enthusiasm and motivation of students to learn in class. This is in line with previous research which revealed that multiplication smart boards are very effective in learning mathematics and can improve students' ability to calculate multiplication. The suggestion for the next research is to utilize smart board learning media in other materials and subjects that are more diverse through effectiveness tests so that they can find out how students respond to the use of smart board media in other contexts.

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