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Analysis of the Development of Image Media Use on Science Learning Outcomes in Primary Schools In the period 2018-2023

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Objective: Technological developments regarding image media have increased quite significantly in the last six years, where the impact of the use of visual media on science learning outcomes at both middle school and high school levels, especially elementary school, is very popular, and there has been an increase in research on both theses and SINTA articles. The goal of this study is to find out how much the usage of visual media affects science learning outcomes. Topics covered in elementary school. **Method:** A Systematic Literature Review (SLR) methodology is used in this investigation. This methodology makes the examination and synthesis of recent research findings in primary school education possible. Using the PRISMA methodology, the study carried out a systematic literature review, covering steps like identification, screening, eligibility assessment, and inclusion criteria. The literature sources covering 2018 to 2023 came from the Google Scholar or Google Scholar database. The conclusions of this research come from database searches carried out using the terms Image Media, Science Learning Results, and Primary School. **Results:** Once the literature search was completed, the analysis yielded ten articles that met the requirements for inclusion in the detailed analysis. This is selected and included. **Novelty:** To ensure students achieve the highest academic success, the application of appropriate media in learning science subjects in elementary grades can positively impact their learning activities.

INTRODUCTION

Education is a process carried out consciously to develop a mindset and lead to better behavior. Education has a significant role in preparing and developing human potential (Hidayah & Mulyani, 2024). Education is a planned effort that aims to achieve specific goals in developing students' abilities to become intelligent people (Huang, 2021; Tapalova & Zhiyenbayeva, 2022; Xia et al., 2022; Yang et al., 2021), have good morals, and have skills as a prerequisite for life in society through teaching and training (Corno, 2023). This is law no article 20 of According to 2003 According to the National Education System, education is a deliberate and organized endeavor that seeks to give students a favorable learning environment and procedure so they can actively realize their potential (Kaplin et al., 2019; Shaturaev, 2021a, 2021b; Usman et al., 2023). In religious spirituality, self-discipline, personal Growth, intelligence, and ethical principles, as well as the skills necessary for individual, societal, national, and global progress (Aithal & Ramanathan, 2024; Hufron & Junaedi, 2021; Kholidah, 2022; Sarbaitinil et al., 2023; Spohrer, 2024). Education has a significant impact, creating people who are professional, competent, and able to keep pace with developments over time (Burns, 2020; Rieckmann, 2018; Elizar & Sumarno, 2022).

The present era of global competition demands quality learning for students to develop their skills, abilities, and talents as capital to confront challenges. Based on accurate information, some students often need help to relate their institutional learning outcomes with a real-life application. The rise of the internet and advanced technologies, such as artificial intelligence (AI) and robotics, has radically transformed our approach to education and learning (Alam, 2021; Baena-Rojas et al., 2023; Bates et al., 2020; Cox, 2021; Jaakkola et al., 2020). This development offers young people new educational opportunities and plays a crucial role in shaping a sustainability-oriented future, which is essential for preserving our planet (Hidayah & Mulyani, 2024). The significance of technology is constantly growing with swift technical-productive advancements in all spheres of society (Pappa et al., 2024). This is because the educational processes in elementary schools emphasize pure skills without deep understanding. Additionally, the present learning conditions commonly only obey the students with low critical thinking skills, who passively obtain academic materials from the teacher (Shalikhah & Nugroho, 2023). 21st-century learning combines literacy skills, knowledge abilities, skills, behaviors, and mastery of technology (Bahtiar et al., 2023). Natural Sciences is one of the elementary school subjects that is considered to play an essential role in shaping students to become qualified (Akgun & Kaya, 2020; Eroğlu & Bektaş, 2022; Höttecke & Allchin, 2020; Park et al., 2020; Timm & Barth, 2021; et al., 2021). Science is an inherent concept of learning closely intertwined with various aspects of human life (Safira et al., 2023). Natural Science describes a group of sciences that study natural objects governed by specific and universal laws, valid whenever and wherever (Anjelina et al., 2023). In line with this statement, science learning requires visualization of an object because the object being studied exists in nature and cannot be presented in the classroom because it is abstract (Rohmani, 2019).

Image media is a precious and effective strategy for learning Natural Sciences. With image media, students are invited to observe and analyze natural phenomena visually so that their learning outcomes can be more optimal (Albus et al., 2021; Chen, 2020; Haryana et al., 2022; Klingenberg et al., 2020; Winarto et al., 2020). Image media is a reproduction of an original in two dimensions, in the form of a photo or painting (Rohmani et al., 2021). The primary purpose of displaying several types of images is "to visualize the concept that you want to convey ."Image media can also make more exciting and interactive learning, making students more motivated to learn (Astuti et al., 2020; Lauc et al., 2020; Sholihah et al., 2020; Susanti et al., 2022; Zeng et al., 2020). Overall, Using visual aids in science education is beneficial for students to understand the material better, remember the information conveyed by the teacher, broaden their horizons, arouse interest in learning, and facilitate various learning activities.

The results of the data analysis for hypothesis test 1 showed that the value (Sig. (2-tailed)) = 0.000 < 0.05 meant that H0 was rejected and H1 was accepted; similarly, the value (Sig. (2-tailed)) = 0.000 < 0.05 meant that H0 was rejected and H1 was accepted for hypothesis test 2. Suparman et al. (2020) In the pretest experimental class, the data analysis showed that the score was 24.00, lower than 25.83 in the control class. After receiving instruction through visual content, the test results of the experimental group showed that learning had been successful in science subjects, which increased by an average of 73.67, while the average of the comparison class was 67.00. Next, the research findings of Dharwisesa et al. (2020) demonstrate that there exist disparities in learning results among a set of students who are instructed via visual aids compared to a set of students who are taught through the traditional teacher-centric method using

traditional learning with a t-value of 35.71 and ttab 2000. According to the findings of this research, the TTW learning model using visual media can improve students' Indonesian language learning outcomes. Therefore, this research is essential because it is still very rare to discuss research related to the use of image media for elementary school-age children, especially in science subjects.

Many people have researched the development of research related to image media. However, no research has yet been found that examines the development of visual media on elementary school science learning objectives during the previous five years, 2018-2023. It is hoped that updates in learning activities from time to time can optimize learning success. Fun learning can make students actively observe learning mechanisms to increase learning success (Prasanti & Purnomo, 2019). Innovation in science learning can create more effective and enjoyable learning (Rohmani, 2019). Thus, this study aims to examine how image media has changed over time and how it has affected science learning objectives in elementary schools (Aqtoina et al., 2023).

Thus, this research is expected to enhance the science instruction standard in elementary schools significantly. Therefore, expectations and reality must be increased in the teaching and learning of natural subjects in elementary schools. Using appropriate visual material is the solution to the problems that have arisen. That is why research related to this topic is done. This research aims to focus on visual media. The subject of this comprehensive literature review is science education in elementary schools.

RESEARCH METHOD

The Systematic Literature Review (SLR) approach is a qualitative research method. This study aimed at systematically defining, evaluating, and synthesizing all pertinent findings related to solving specific problems and addressing preset queries. This research used the SLR approach, which involves systematically reviewing and identifying relevant journals, following structured steps based on predefined criteria (Triandini et al., 2019). Researchers create a basic framework and formulate problems by using SLR to guide the development of discussions and conclusions.

A Systematic Literature Review serves as the foundation for this study. It includes many literary works, including theses, journals, and review articles (Pilendia, 2020). Library research serves as the method to gather comprehensive information or data related to the topic from diverse research sources. Following data collection, descriptive analysis is performed to elucidate facts and offer concise explanations. The literature review data for this study was primarily sourced from Google Scholar. The steps of this research are as follows: 1) defining the topic or problem being considered, 2) identifying related reference materials via Google Scholar, 3) selecting Google Scholar results according to predetermined criteria, 4) creating a synthesis matrix from the results obtained, 5) Number of citations (Triandini et al., 2019) and 6) concluding the results of the review. The SLR flowchart studies are depicted in Figure 1.

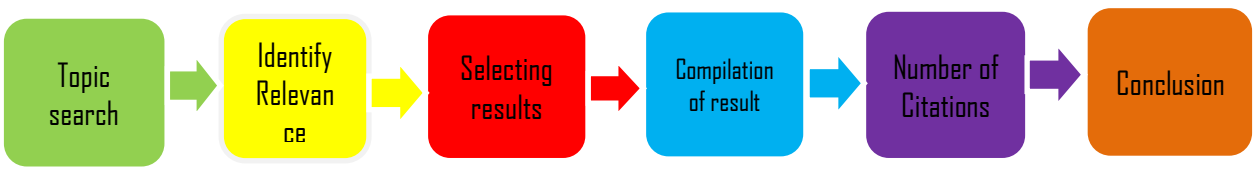

Figure 1. SLR stages chart.

This study adopts the PRISMA approach for systematic reviews and meta-analyses, which directs the stages of identification, screening, eligibility, and inclusion. Researchers searched the Google Scholar database for scientific article publications spanning the last six years (2018-2023). They utilized the specific keywords "Image Media," "Science Learning Outcomes," and "Primary School Students" to locate relevant journal articles on https://scholar.google.com/. Articles meeting predefined inclusion criteria were selected and extracted based on the following search criteria:

1. Keywords: "Image Media," "Science Learning Outcomes," and "Primary School Students."
2. Time Frame: Limit publication date to the last six years (2018-2023).
3. Indexed in the Scientific and Technological Index (SINTA).
4. Articles available in English and Indonesian.
5. Minimum of 10 references.
6. Journal article type (excluding theses and undergraduate theses) with full-text availability.

The study was conducted in May 2024, and the search focused on gathering relevant journal articles meeting these criteria from Google Scholar. The process of selecting articles Is based on the inclusion criteria and the PRISMA approach, as illustrated in Figure 2. Figure 2 presents the outcomes of the literature selection process. according to more specific keywords (n=12.80)

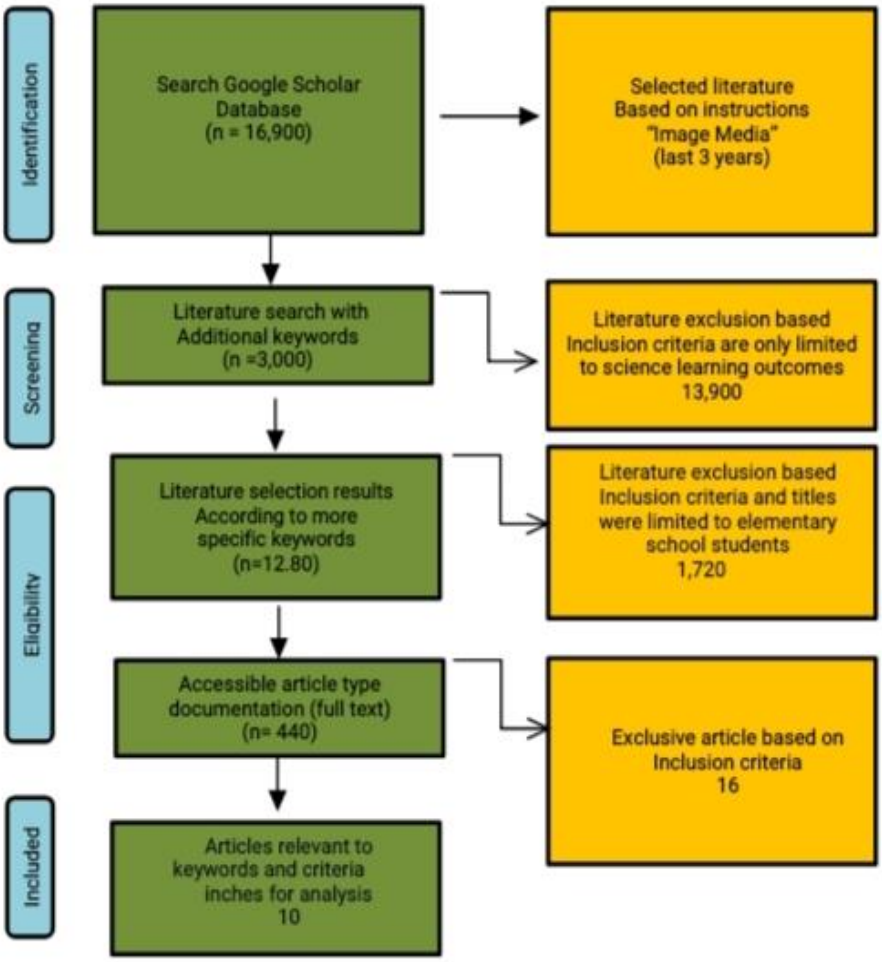

Figure 2. PRISMA approach.

RESULTS AND DISCUSSION

Results

The SLR results were in accordance with the inclusion criteria and PRISMA method. Suitably selected articles regarding the impact of visual media on learning outcomes in elementary school science subjects have been accepted. These results are obtained from the following four steps.

1. Identification

In the identification phase, researchers used Google Scholar to gather article data from scholarly sources. The search commenced with the keyword "Image Media" for the last five years; articles were retrieved (n = 16,900).

2. Screening

In the screening phase, additional keywords were added to the literature search. The initial search was completed with the keyword "Image media and science learning outcomes in learning activities" to obtain article results (n=3000). Then, the focus was on certain criteria related to scientific knowledge, and the results achieved were based on the number of articles (n=13,900).

3. Eligibility

The articles obtained in the feasibility phase (n=1720) were added to the more specific "primary school students" search term. Then, only journal articles with articles (n=16) were selected as the type of document selection.

4. Including

The final data obtained from the inclusion criteria resulted in the selection of several articles at the inclusion stage. These articles will be analyzed and discussed with the final selection, resulting in 10 articles (n = 10).

A literature insight search in the Google Scholar database controls how research results are presented based on subject-related keywords. The results of the analysis of publications selected for 2018-2023 or the last six years are in tabular form accompanied by graphs and explanations. The literature search was based on predetermined criteria. Figure 3 shows the number of downloaded documents based on keywords published in the last six years.

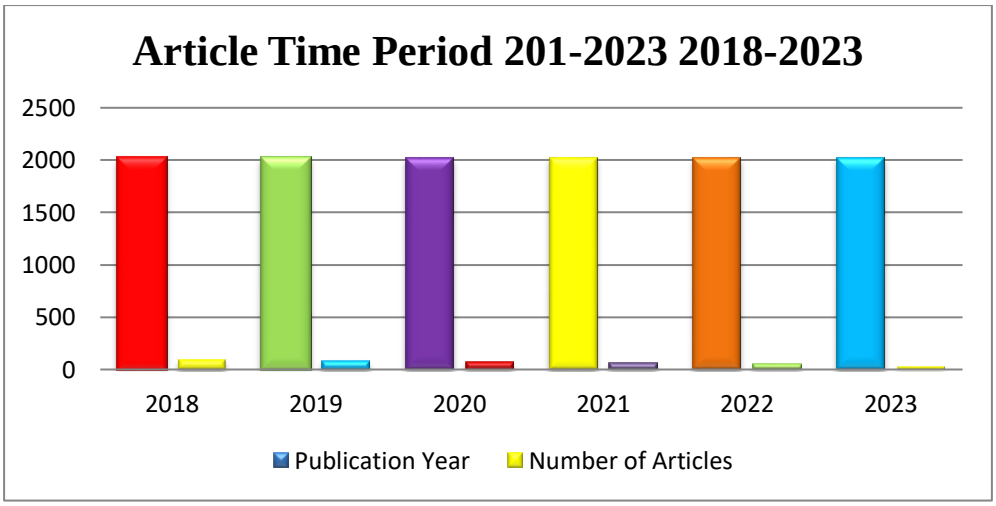

Figure 3. Clear line drawings are essential.

Figure 3. Several publications in 2018-2023 were obtained from the Google Scholar database using the search keywords "Image Media," "Science Learning Outcomes," AND "Primary School Students." Figure 3 depicts search results for a number of documents regarding specific keywords published in the last six years. Literature search results with predetermined keywords do not fully comply with predetermined inclusion criteria. This research specifically focuses on journal articles.

Discussion

In the results of the article analysis, in addition to keywords, the PRISMA approach was also used, which obtained 16,900 documents with the keyword "Image Media" from the last five years from the first literature searches of the Google Scholar database. These documents encompass categories such as books, theses, and articles. Further literature searches using the keyword "science learning outcomes" yielded 3,000 documents, followed by a focus on title criteria that narrowed to 13,900 science learning outcomes, resulting in 12,800 documents. The keyword "primary school students" was added to obtain 1,720 documents. Subsequently, only journal articles were selected, totaling 440 articles. Articles selected were published based on the specified keywords according to established criteria, and ten articles related to the topic were accepted for review. Table 1 is the outcomes of the review of 10 articles on the impact of visual media on students' learning outcomes in science subjects in primary grades.

Table 1. Review results.

Title of Article & Author	Number of Citations& Citations	Research result
The Influence of Image Media on Science Learning Outcomes in Elementary School Students (Suparman et al., 2020)	67 (Sinta 5)	The data analysis of the presented test class showed a low value of 24.00, while the control class received 25.83. After learning through visual media, the posttest analysis of the experimental class showed that learning results in science subjects increased by an average of 73.67, while the average of the comparison class was 67.00.
Application of the TTW Model Assisted by Image Media Improves Indonesian Language Learning Outcomes. (Dharwisesa et al., 2020)	15 (Sinta 3)	The research results show that there are differences in learning outcomes between the group of students taught by the visual media taught by the TTW learning model and the group taught by the traditional learning model, with a t count of 35.71 and ttab. 2000. Based on the results of this study, using visual media, the TTW learning model can improve the results of students learning the Indonesian language in fourth-grade elementary school.

Title of Article & Author	Number of Citations& Citations	Research result
Application of the Project-Based Learning Model (Project-Based Learning) Assisted by Image Media to Improve Your Ability to Write Fantasy Stories (Ginting, 2020)	11 (Sinta 3)	The results of data analysis mean the skill value for writing fantasy stories in cycle I is 72.46, with a classical completeness of 43.33%, and the average value of critical response text writing skill in cycle II is 81.76, with a classical completeness of 86.67%. Image media assisted in applying a project-based learning model to class VII A 1 students at SMP Negeri 1 Singaraja.
Analysis of The Effect of Image Media on Elementary School Students' Beginning Reading Ability. (Oktaviyanti et al., 2022)	83 (Sinta 5)	The research results showed that the average posttest score was lower than the average in the control class, at 44.68, compared to 68.65 in the experimental class. The data analysis technique employed was an independent sample t-test with a significance level of 5%, conducted using SPSS version 21.0. The calculated t-value is 3.304, which exceeds the critical t-value of 1.681. This indicates that the alternative hypothesis (Ha) is accepted, and the null hypothesis (H0) is rejected. Therefore, image media significantly influences the beginning reading abilities of second-grade students at SDN 23 Ampenan for the 2019/2020 academic year.
Efforts to Improve Student Learning Outcomes Through the Application of the Recitation Method with Image Media in Science Subjects Material on Plant Structure and Function in Class VIII-1 Semester 1 of JHS 4 Bolo for the 2020/2021 Academic Year. (Kasmir, 2021)	18 (Sinta 4)	After implementing the actions in cycle I, The posttest results show that the average student learning outcomes were 78.25. This average value has increased (+3.25), and the completion percentage has increased (+2.00) compared to before the improvement. Meanwhile, teacher performance for learning planning scored 91.80 (+0.30), and learning implementation was 91.88 (+0.18) in cycle I. Student learning achievement and teacher performance still did not meet the criteria for success, so it needed to be continued in the next cycle. In cycle II, the posttest results showed that student learning outcomes averaged 85.55 (+7.30) with a classical completion percentage of 90.75% (10.75).

Title of Article & Author	Number of Citations& Citations	Research result
Application of The Examples Examples Type Cooperative Learning Model Assisted By Image Media to Improve Geography Learning Outcomes (Narina, 2020)	12 (Sinta 4)	The results show that the percentage of individual performance is 68% in the first, 74% in the second, and 93% in the third. Traditional pass rates are 60% in the first cycle, 70% in the second cycle, and 90% in the third cycle, indicating increased activity by teachers and students when transitioning from the first and second cycles to the third cycle, according to the curriculum. Standards. The teachers' management skills received a good evaluation, with scores of 2.7 in the first, 2.8 in the second, and 2.9 in the third.
Application of the AIR (Auditory, Intellectualy, Repetition) Learning Model using Image Media in Elementary School Thematic Learning (Bonatua et al., 2021)	26 (Sinta 5)	Based on the research and discussion results, visual media are used in the thematic learning of the fourth grade of Marga Tunggal Primary School when applying the AIR (Auditory, Intellectual, Repetition) learning model. This is reflected in the mean pretest scores of 48.08 and post-test scores of 78.3. Implementing the AIR (Auditory, Intellectual Repetition) learning model significantly improved the learning results of the fourth-grade students of Marga Tunggal Elementary School.
The Effect of Using Series Image Media on the Ability to Write Narrative Essays of Class V MI Muhammadiyah 1 Payaman Students (Ati, 2021)	11 (Sinta 3)	The data analysis technique uses a particular t-test formula. From the data analysis, it is known that count> table where dk = 66 at the 5% significance level. The values obtained are count = 2.105 and table = 1.9965. It can be concluded that the use of visual media significantly influences the ability of class V MI Muhammadiyah 1 Payama students to write narrative essays.
Teaching Arabic Using Moving Image Media to Improve Vocabulary Mastery (Qibtiyah & Walfajri, 2020)	16 (Sinta 2)	Research results show that the learning process using moving image media could increase students' performance and enthusiasm for learning. Enthusiasm for learning is characterized by high concentration in the learning process, which encourages students to understand lessons easily. The high learning concentration is due to the versatile characteristics of moving image media, which are consistent with student progress. The teacher's media skills support the successful use of moving image media. The statistical analysis

Title of Article & Author	Number of Citations& Citations	Research result
		results show that the application of moving image media in learning Arabic significantly affects students' vocabulary.

Based on Table 1, the results of a literature search for 10 Google Scholar articles that meet the inclusion criteria using the PRISMA approach show that image media can improve science learning outcomes. This literature review systematically examines image media in science learning in elementary schools. This research looks for literature sources from Google Scholar with a focus on science learning in the last six years (2018-2023), which was researched using a Google Scholar literature search to collect significant data in research involving image media. This shows that Image Media has succeeded in improving Elementary School Students' Science Learning Outcomes (Amali et al., 2023; Hardiansyah & Mulyadi, 2022; Rukayah et al., 2021; Senen et al., 2021; Syawaluddin et al., 2020).

Image media in science learning has many significant benefits, such as improving the learning outcomes of elementary school students. Through the use of appropriate visual media, students can learn more actively. This method encourages students to think critically, filter information, and solve problems with various solutions. They provide opportunities for students to gain more meaningful learning experiences, such as directly understanding real scientific concepts. This helps students understand the material more effectively because they can gain direct experience that is more useful than just reading or listening. The more actively students learn, the more optimal they will understand learning (Firmanzah & Sudibyo, 2021).

Based on Table 1, there were 10 articles that met the inclusion criteria, which focused on image media to improve science learning outcomes in elementary schools. Table 1 shows the effectiveness of image media in improving student learning outcomes. The search for analyzed literature studies shows that image media can be applied effectively in the learning process to improve student performance in elementary school science education significantly (Huang et al., 2020; Safaruddin et al., 2020; Sahin & Yilmaz, 2020; Susilawati et al., 2022; Winarni et al., 2020; Wu et al., 2021). Image media is one of the factors that influence the success of learning (Abdulrahman et al., 2020; Al-Fraihat et al., 2020; Hosen et al., 2021; Ifenthaler & Yau, 2020; Li & Xie, 2019; Shehzadi et al., 2021). Teachers must be creative in creating optimal learning conditions based on students' goals and characteristics, defining, adapting, and applying appropriate visual resources to attract students' interest and active participation in the learning process.

CONCLUSION

Fundamental Finding: Based on the results and discussion of the analyzed literature study, it is evident that image media can be effectively applied in the learning process to significantly improve student learning outcomes in science education in elementary schools. **Implication:** Systematic Literature Review (SLR) using the PRISMA approach has highlighted several key findings: 1. Effectiveness of Image Media, 2. Increased Student Engagement, 3. Identification of Effective Media. The systematic literature

review underscores image media's significant role in enhancing elementary school students' science education. Limitation: Image media improves learning outcomes and fosters a positive attitude toward science by making abstract scientific concepts more concrete and engaging. **Future Research:** Educators and researchers should continue to explore and expand the use of visual aids and other innovative educational media to ensure all students have the opportunity to succeed and excel in science.

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