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Analysis of the Effectiveness of Using Audio Visual Media in Science Learning in Elementary Schools

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ABSTRAK

Media pembelajaran audio visual merupakan alat bantu yang diterapkan dalam konteks proses belajar mengajar untuk menyampaikan informasi dari materi pelajaran dengan menggabungkan unsur suara dan gambar. Latar belakang penelitian ini ialah masalah rendahnya hasil belajar siswa dalam mata pelajaran IPA, yang seringkali disebabkan oleh metode pengajaran tradisional yang kurang menarik dan tidak mampu mengakomodasi gaya belajar siswa yang beragam. Tujuan penelitin ini untuk menganalisis efektivitas penggunaan media audio visual dalam pembelajaran Ilmu Pengetahuan Alam (IPA) di tingkat sekolah dasar. Metode yang diterapkan adalah Systematic Literature Review (SLR), Data yang di peroleh berasal dari studi literatur dengan tahapan identfikasi, screening, eligibilitas, dan inklusi dengan menggunakan basis data dari Google Scholar. Metode analisis yang di pakai ialah analisis deskriptif. Tinjauan literatur dilakukan melalui 3 tahap pencarian. Tahap pertama menggunakan kata kunci "Penggunaan media audio visual" menghasilkan 7.750 dokumen, kemudian pada tahap kedua kata kunci tersebut ditambah dengan "Pembelajaran IPA" menghasilkan 1.160 dokumen, dan pada tahap ketiga kata kunci ditambah lagi dengan "di sekolah dasar" menghasilkan 648 dokumen. Dokumen-dokumen ini kemudian disaring berdasarkan kriteria inklusi, dan hasilnya adalah 8 artikel yang akan dianalisis lebih lanjut oleh peneliti. Hasil penelitian menunjukkan bahwa penggunaan media pembelajaran audio visual memiliki dampak positif terhadap pembelajaran IPA di sekolah dasar. Selain itu, penggunaan media ini juga dapat meningkatkan hasil belajar IPA secara signifikan, baik pada kelas rendah maupun kelas tinggi. Dengan demikian, media audio visual telah terbukti membantu dalam proses pembelajaran IPA di sekolah dasar.

ABSTRACT

Audio visual learning media is a tool that is applied in the context of the teaching and learning process to convey information from subject matter by combining elements of sound and images. The background to this research is the problem of low student learning outcomes in science subjects, which is often caused by traditional teaching methods that are less attractive and unable to accommodate students' diverse learning styles. The aim of this research is to analyze the effectiveness of using audio-visual media in learning Natural Sciences (IPA) at the elementary school level. The method applied is Systematic Literature Review (SLR). The data obtained comes from literature studies with stages of identification, screening, eligibility and inclusion using the Google Scholar database. The analytical method used is descriptive analysis. The literature review was carried out through 3 search stages. In the first stage, using the keyword "Use of audio-visual media" produced 7,750 documents, then in the second stage, the keyword was added with "science learning" to produce 1,160 documents, and in the third stage, the keyword was added with "in elementary school" to produce 648 documents. These documents were then filtered based on inclusion criteria, and the results were 8 articles which would be further analyzed by researchers. The research results show that the use of audio-visual learning media has a positive impact on science learning in elementary schools. Apart from that, the use of this media can also significantly improve science learning outcomes, both in low and high classes. Thus, audio visual media has been proven to help in the science learning process in elementary schools.

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1. INTRODUCTION

Education has a crucial role in forming quality and competitive individuals (Alcides et al., 2020; Thanaporn et al., 2020) . Through the learning process, humans can develop various personal potentials, both intellectual, social and emotional (Anshu & Babita, 2022; Neslihan, 2020). Education also plays an important role in preparing individuals to become individuals who have noble character, are responsible, and are able to contribute positively to society (Ankit & Upadhyay, 2022; Dilnavoz et al., 2023). In this digital era, education is adapting by utilizing technology to provide a more interesting and effective learning experience (Mohammed et al., 2020). Apart from that, in the digital era characterized by very rapid technological developments, the world of education is also experiencing a major transformation(Monisha. & Valanteena., 2022). Digital learning comes as a breath of fresh air, opening the gates to a more innovative, interesting and interactive educational future. No exception in elementary schools (SD) (Candra, 2022) . The integration of digital technology into educational practices has become an increasingly widespread trend (N. & Ivanova, 2022). Then, in the world of education there is one knowledge that has been taught from the initial education level to the upper education level, namely knowledge related to science or often called natural science (Miriam & Arritokieta, 2022). Natural Sciences (IPA) is a core subject in elementary education (A.A. et al., 2020; Vincentas, 2022) . Science education or learning aims to equip students with knowledge and understanding of natural phenomena, as well as developing various Essential abilities, including scientific reasoning, critical analysis, and creative thinking (Idris, 2022). Natural sciences in elementary schools play an important role in equipping students with basic scientific knowledge and skills (Nurul & Edi, 2022; Polonca et al., 2022). From an early age, children have a great curiosity about the natural phenomena around them (Julie & Firdevs, 2019). This curiosity needs to be nurtured and directed so that it develops into an interest and love for science (Jamie, 2020). Through effective science learning, students are anticipated to grasp basic scientific concepts, develop critical and logical thinking skills, and be able to solve problems scientifically (Neneng et al., 2022). This becomes the basis for them to continue learning and developing themselves in the future, as well as becoming individuals who are able to contribute positively to the progress of the nation.

The reality that is happening nowThere are still many students who face difficulties when studying science, which affects students' interest and learning outcomes (Seka & Abroto, 2021). Various factors can be the cause, such as uninteresting learning methods, Insufficient student engagement in the educational process, and other shortcomings.adequate learning resources, as well as a lack of learning media that supports the teaching and learning processThe main factors that need to be addressed (Sathyendra et al., 2020). This can result in negative impacts for students, such as suboptimal understanding of science concepts, lack of interest and motivation as well as science learning outcomes, as well as underdeveloped critical and creative thinking skills (Ana et al., 2021). To overcome this problem, it requires joint efforts that must be carried out comprehensively from various parties, such as using creative, active and innovative learning media. One educational tool that can be utilized is audiovisual media. Audio visual media is an instrument or equipment used in the learning process to convey information from subject matter through visual and auditive methods by combining elements of sound (audio) and images (visual) (Masrid & A, 2021; Rhomiy, 2023). This media supports teachers in concretizing complex teaching material so that it can be understood more easily by students (Fitri & Asnawi, 2022; Miranda. & Desyandri, 2022). Then, this audio-visual media also presents a combination of images, videos and sounds which are able to stimulate students' senses of sight and hearing simultaneously (Syarifah et al., 2022). The advantage of audio visual media is that it can help students visualize random concepts in science, such as the structure of the human body, the process of photosynthesis, and the movement of planets. This can enhance students' comprehension of the material and boost their enthusiasm for learning Natural Sciences (Anis et al., 2022). The application of audio-visual media in science learning can also increase students' curiosity and creativity and can encourage students to carry out their own research and experiments to learn more about natural phenomena (Afina et al., 2023). By implementing audio-visual media, science learning in elementary schools is expected to become more interesting, effective and meaningful for students. This will help them develop curiosity, interest and love for science (Nadya & Pradina, 2022). Extensive research has been conducted on the use of audio-visual learning tools in education. One particular investigation conducted by Suyitno concerning the utilization of audio-visual media, it has demonstrated efficacy in enhancing student engagement and improving learning results, as evidenced by the findings of this study (Suyitno et al., 2020). In addition, research conducted by Azizah dan Lutfi in the context of science education at the junior high school level, research indicates that employing audio-visual media can substantially enhance comprehension and knowledge acquisition in natural sciences (Azizah & Lufri, 2021). Despite extensive study, the integration of audio-visual learning tools remains limited in elementary science education. Thus, this research aims to assess the efficacy of incorporating audio-visual media in elementary science education through a

literature review analysis. This literature review will explore the concepts, benefits, and theoretical foundations of using audio-visual media in elementary science education, along with an analysis of previous studies on the topic. The aim is to offer valuable insights for teachers, researchers, and policymakers to enhance the quality of science education in elementary schools. Teachers can utilize the findings from this research to select and implement suitable audio-visual media in their science lessons.

2. METHOD

The research methodology utilized in this study adopts a Systematic Literature Review (SLR) approach. SLRs represent a distinctive qualitative research method employed to systematically identify, evaluate, and synthesize all relevant findings, aiming to address specific issues and respond to predefined inquiries (Von Elm et al., 2019). In practical application, the SLR methodology entails a systematic examination and identification of numerous journals, with each step following predetermined criteria. Through the conduct of SLR research, scholars can unveil the fundamental framework and problem formulation, subsequently elaborating on them through structured stages of discussion. This study draws upon data gleaned from literature reviews, encompassing diverse sources like journals, theses, and review articles. According to (Pollock, 2019) Library research serves as a technique to compile all relevant information or data from sources pertinent to a particular study. After collecting data, the step that must be taken is to carry out analysis. The analytical method used in this research is descriptive analysis which is carried out to explain and provide a brief explanation of the facts. The literature review data in this research was obtained from Google Scholar. The steps encompassed in this investigation include: 1) defining the topic or issue under examination (topic research), 2) locating pertinent reference materials via Google Scholar (Identify Relevant Research), 3) filtering Google Scholar results according to predetermined criteria (Selecting result), 4) constructing a synthesis matrix from the acquired outcomes (Compilation of result), and 5) concluding the review of findings (Cunclusion) (O'Donnell et al., nd). The steps involved in conducting a Systematic Literature Review (SLR) are illustrated in Figure 1.

Figure 1. Stages of Research in the Systematic Literature Review Method

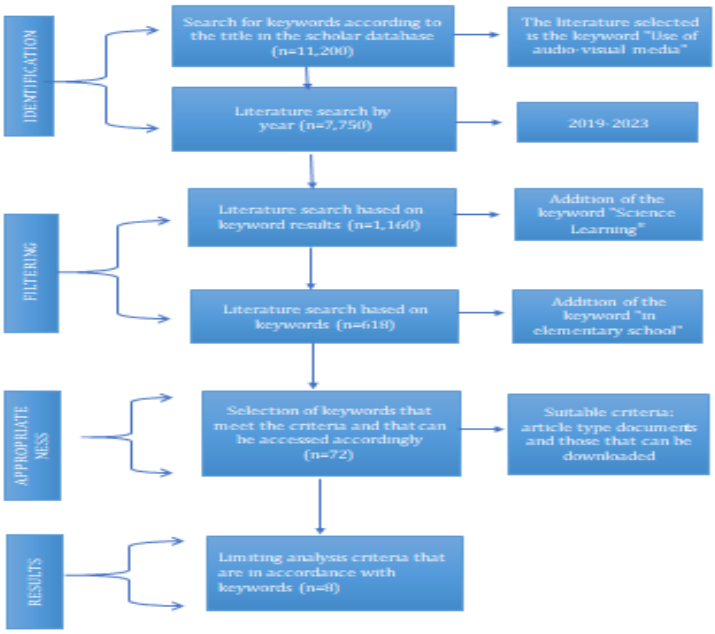

Figure 2. Systematic Literature Review Search Process

This research will focus on the discussion in the literature review. The articles that will be reviewed are contained in the scholar database from 2019 to 2023. Search for articles on the page Google Scholar_carried out in May 2024 with the keyword "Use of audio-visual media" getting 11,200 results, then limiting the year to 2019-2023 getting 7,750 results from all types of documents then adding the word AND and the second keyword, namely "Science Learning" getting 1,160 results. After that, finally the word AND was added again and the third keyword, namely "in elementary school", got a result of 648. From the 648 articles, data was selected and tested for feasibility by the researcher until 8 articles were obtained which were correct and in accordance with the aim of the literature review which was in accordance with the words key to the article title. Below is a chart of the stages of the literature search as written above.

3. RESULT AND DISCUSSION

Result

The results of literature searches obtained from the scholar database are useful for presenting data in the form of tables, graphs, images and other data which will be useful for readers and can be presented in the discussion chapter. Articles regarding the use of audio-visual media in science learning in elementary school have developments every year from 2019 to 2023. The following article developments in the scholar database are presented in the form of a diagram :

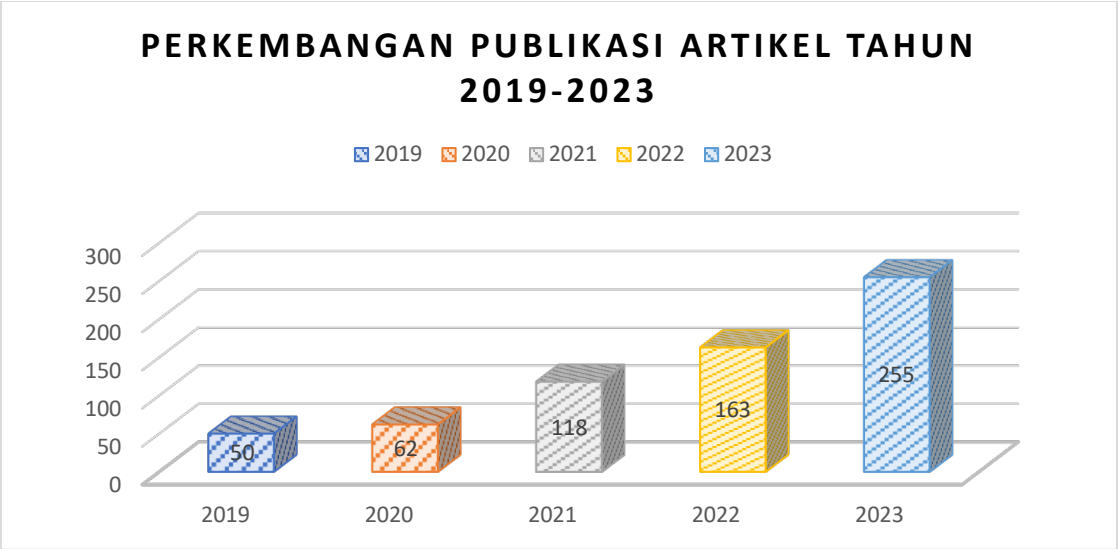

Figure 3 . Development of articles regarding the use of audio visual media in science learning in elementary schools

In Figure 3, it can be concluded that the development of articles regarding the use of audio-visual media in teaching science in elementary schoolsfrom 2019 to 2023, it has increased every year in the last 5 years. This can be seen from the diagram that has been presented, where in 2019 there were 50 published articles from various file types from the Google Scholar database. Furthermore, in 2021, 62 articles were found in search results. Then the following year there was an increase and 118 articles were obtained from various file types. Then, in 2022 there was another increase and 163 results were found. Finally, in 2023 there was the largest increase in publications, namely 225 from various types of document files. To find out the average number of articles per year in the Scholar database, researchers will describe it in the calculations below:

$$\tilde{x}=\frac{Jumlah\ artikel}{Jumlah\ tahun}$$

$$\tilde{x}=\frac{648}{5}$$

= 123.6 articles

So, the average number of article developments per year obtained in the Google Scholar database is 123.6 articles or rounded up to 124 articles. Then, from the results of searches carried out by researchers in the Scholar database in 2019-2023, the number of articles cited was different in each year. The number of articles that have been cited in the last 5 years is 268 articles. Below is presented article data cited from 2019 to 2023 regarding the use of audio-visual media in science learning in elementary schools :

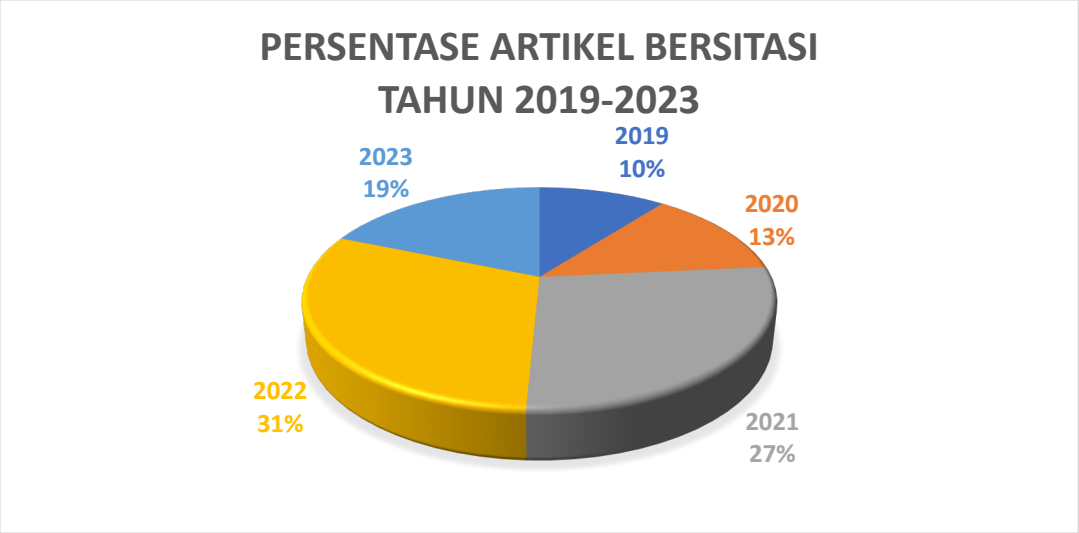

Figure 4. Percentage of Articles Cited in 2019-2023 Concerning the Integration of Audiovisual Media in Science Education at Elementary School

In the diagram above, it is presented with an explanation that the number of cited articles in 2019 was 10%, then in 2020 the number of cited articles was 13%, then in the following year, namely 2021, the number of cited articles was 27%, after that in In 2022 there will be an increase in the number of cited articles, namely by 31% and in 2023 the number of cited articles will reach 19%. Of the 648 articles that were found in the Google Scholar database, they contained the keywords "Use of Audio-visual media", "Science Learning", then added the keyword "in elementary schools" and restrictions for 2019-2023 and continued looking for articles that matched the search results criteria. The literature that had been determined by the researcher obtained 8 articles whose citations were limited for review. The 8 articles will be reviewed and analyzed by researchers. Here are the findings from an examination of 8 articles discussing the application of audiovisual media in elementary education:

Table 1. Findings from the Analysis of Reviews on Articles Discussing the Integration of Audio-Visual Media in Elementary School Science Education

Article Title & Author	**Identity Journal**	**Type Study**	**Results Study**
The Impact of Utilizing Audiovisual Media on Science Learning Outcomes for Fourth Grade Students in Elementary Schools (Windasari & Syofyan, 2019)	Journal of elementary education	This study applied a pre-post experimental method with one group of subjects tested before and after the intervention.	The results of this research show thatAudio visual media has been proven to increase learning outcomes significantly, with a pretest score that is 12.515 smaller than the posttest.
The Influence of Using Animaker Audio Visual Media on Science Learning Motivation Elementary School Students. (Maheswari & Pramudiani, 2021)	Educative: Journal of Educational Sciences	The research methodology employed is a quantitative approach utilizing a PostTest Only Control Design research design	This study observes that employing audiovisual Animaker media positively impacts the motivation to learn Natural Sciences (Science) among fourth-grade students at SDN Pekayon 12.

Article Title & Author	**Identity Journal**	**Type Study**	**Results Study**
The Influence of Using Audio Visual Media on Learning Outcomes in Science Subjects in Elementary Schools (Siswanto & Susanto, 2022)	JRTI (Indonesian Journal of Action Research)	This research uses a quantitative approach involving surveys as the method.	The findings from the research show that the use of Audio Visual Media for Natural Sciences has a significant impact on the achievement of learning outcomes, which is confirmed by rejecting the null hypothesis (H0) and accepting the alternative hypothesis (H1).
The Influence of Google Meet-Based Audio Visual Media on Students' Science Learning Outcomes in Elementary Schools (Dewi & Erwin, 2021)	Basicedu Journal	The research methodology utilized is a quasi-experimental approach employing a non-equivalent control group design.	The research results confirm that the use of Google Meet-based audio visual media provides significant benefits for students, increases understanding of subject matter, and Also contributes positively to attaining science learning objectives.
The Influence of The Effect of Audio-Visual Media on Elementary School Students' Understanding of the Water Cycle Concept (Safitri & Kasriman, 2022)	Basicedu Journal	This study employs a quantitative research methodology, utilizing the Pre-Experiment approach with a One Group Pre-Test Post-Test design.	The research findings suggest that incorporating audiovisual media is effective in significantly increasing students' knowledge of the water cycle material in class V at SDN Bambu Apus 01 East Jakarta.
Effectiveness of Using Powtoon-Based Audio Visual Learning Media in Science Subjects in Class IV (Hanipah & Saputra, 2022)	Pedagogical Journal	This research methodology adopts a descriptive approach with a qualitative methodology.	The research findings indicate that students achieve high levels of performance in science learning when utilizing Powtoon-based audiovisual media, with an average score of 83.3%.
The Impact of Audio-Visual Learning Tools on Science Achievement among Fifth Grade Elementary School Pupils (Aristo et al., n.d.)	Journal of Research and Community Service in Educational Sciences	This study employs a quantitative approach within a pre-experimental framework.	The research findings indicate that the utilization of audiovisual media in Integrated Science learning in class V at SDN 26 Dompu has proven to have a significant influence on achieving student learning outcomes.
Assistance in Utilizing Audio-Visual Tools for Enhancing Fourth Grade Students' Educational Achievements Science Learning at SDN Unyur (Aris & Kartikasari, 2020)	UPG Journal	This study employs classroom action research (PTK) methodology."	The results of the study validate the effectiveness of utilizing audio-visual learning aids to enhance students' comprehension and academic performance in the field of science, particularly concerning human sensory organs.

Based on eight articles that have been analyzed and reviewed by researchers, several important findings were obtained. Over the last five years, research shows an increase in the prevalence of the use of audio-visual media in elementary school science education. This increase is supported by various studies that have been carried out and analyzed by researchers. The research findings reveal the positive impact of using audio-visual media in science education. This media can effectively complement various science curriculum materials at the elementary level, making a significant contribution in clarifying the concepts

being taught. Furthermore, the application of audio-visual media in science learning at the elementary level has been proven to make the learning process more effective for educators. The use of this media not only arouses students' interest and motivation, but also increases their enthusiasm for learning, which ultimately has a positive impact on academic achievement, especially in science subjects.

Discussion

Research conducted by Windasari (Tahan Suci Windasari) demonstrated that audio-visual media positively affected learning achievement, as indicated by a posttest score increase of 12,515 points compared to the pretest . Additionally, findings by Galuh and Puri (2021) underscored the favorable impact of animated audio-visual media on science learning motivation among fourth-grade students, as supported by the results of normality, homogeneity (f-test), and hypothesis (t-test) analyses. The t-test results indicated that the tcount value (6.514) exceeded the ttable value (1.680), leading to the acceptance of hypothesis H1. Moreover, research by Maya and Ratnawati (2022) highlighted the positive and significant influence of audio-visual media on the science learning achievement of fifth-grade students at SDN Duri Kepa 17 Pagi. Lastly, investigations by Putri and Erwin (2021) revealed that the utilization of Google Meet-based audio-visual media aided in enhancing students' comprehension of science subjects, thereby positively impacting their learning outcomes. Educators find audiovisual media to be a compelling tool for delivering complex learning material to students. Rahma & Kasriman (2022) support this notion, asserting that audiovisual media holds promise for enhancing student learning outcomes. Ani & Erwin's (2021) research further demonstrates the efficacy of audiovisual media, revealing that student engagement reached an impressive 83.3% when utilizing powtoon-based audiovisual learning resources in science classes, indicating a "very good" level of participation and enthusiasm. Additionally, Mulya et al. (2023) validate the effectiveness of audiovisual learning tools in Integrated Science classes for fifth-grade students at SDN 26 Dompu, as evidenced by a notable increase of 19.38 points in average pretest and posttest scores. Similarly, research conducted by Ika & Cika highlights positive outcomes associated with the implementation of audiovisual media in teaching the human senses concept to fourth-grade students at SDN Unyur, indicating improved learning achievements. These findings underscore the significant role of audiovisual media in enhancing the quality of education and student learning outcomes, offering an engaging, interactive, and easily comprehensible learning experience that fosters student participation and motivation.

The above research revealed several significant key results. First, audiovisual media has been proven to increase student learning achievement significantly, as shown by various studies that observe an increase in posttest scores compared to pretest (Aristo et al., n.d.; Windasari & Syofyan, 2019) . Second, this media also has a positive influence on student learning motivation, which can be seen from increased participation and enthusiasm in the learning process (Safitri & Kasriman, 2022; Siswanto & Susanto, 2022). The implication of this research is that audiovisual media can be used as an effective tool to improve the quality of learning. By providing material that is more interesting and easy to understand, this media can help students to be more involved in the teaching and learning process, which ultimately improves their learning outcomes. Educators can utilize this technology to make learning more interactive and fun, which can increase students' motivation and interest in the material being taught (Achmad et al., 2022; Herbert et al., 2022) However, this study also has several limitations that need to be considered. One limitation is that this research was only conducted in a few specific schools, so the results may not be generalizable to all schools. In addition, this research focuses more on science subjects and may not have tested the effectiveness of audiovisual media in other subjects. For future research, it is recommended to conduct a broader study involving more schools and various subjects. Apart from that, it is also necessary to carry out long-term research to see the impact of using audiovisual media over a longer period of time. Thus, this research provides a clear view of the benefits of using audiovisual media in education, as well as providing recommendations for educational researchers and practitioners to continue to explore and utilize this technology in the learning process.

4. CONCLUSION

According to the findings of a review analysis conducted by researchers on eight articles meeting literature review criteria, it is evident that audio-visual learning media significantly and positively impacts the enhancement of science learning outcomes in elementary schools, spanning from initial to final grades. This media has proven to be a mediumArranging learning to be more productive and save time to improve qualitystudent learning. The main benefits of audio visual learning media include: increasing willingness to learn, increasing understanding of material, improving memory, developing critical thinking skills, increasing communication skills, facilitating individual learning. Increasing learning accessibility. In light

of these discoveries, researchers suggest that educators, particularly those in elementary schools, expand the utilization of audiovisual learning media within the science instruction and learning framework. Incorporating this media can assist students in comprehending the material more effectively, enhancing learning achievements, and fostering the development of various essential skills. It's crucial to recognize that audio-visual learning media serves as a tool that has the potential to enhance the quality of science education. Educators need to use this media creatively and innovatively, and combine it with other learning methods so thatTeaching is structured in such a way that students can gain a better and more meaningful understanding

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