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Effectiveness of Using Audio Visual Media in Improving Student Achievement in Mathematics Learning in Elementary Schools

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ABSTRACT

Background. Audio-visual media is media that contains elements of sound and images. It is useful for conveying information, knowledge, ideas, ideas in a more interesting way. The proper use of audiovisual media in accordance with the needs in education will be able to improve learning achievement. Audio visual media will help students in developing logical, critical, and creative thinking skills in solving problems. The use of audiovisual media in learning mathematics can improve student achievement in elementary school. This can be achieved as long as the use is effective and efficient.

Purpose. This study aims to measure the effectiveness of using audio-visual media in improving student achievement in mathematics learning in elementary schools. This research will also be useful to find out the factors that influence the success of using audio-visual media. In addition, it is also to find out how far audiovisual media can help students in understanding mathematical concepts, increase learning motivation, and develop logical, critical, and creative thinking skills.

Method. The method used in this research is quantitative. Quantitative method is a way of presenting data in the form of numbers. The data obtained is the result of the acquisition of responses. The data is taken from the distribution of questionnaires containing questions related to the effectiveness of the use of audio-visual media in improving student achievement in mathematics learning at the elementary school level.

Results. The results of this study state that the use of audio visual in math learning in elementary schools can improve student achievement. The use of audiovisual media has a positive effectiveness in learning mathematics in elementary schools. The use of audiovisual media can improve student learning outcomes, concept understanding, ability to analyze, and interest in learning. However, the use of this media must also pay attention to certain factors in order to be effective.

Conclusion This research can be concluded that audio visual media as a learning medium that contains elements of sound and images will be able to be used to convey information, knowledge, ideas, or ideas more interestingly. The use of audio-visual media in learning mathematics will help in improving students' concept understanding, interest, and learning outcomes.

KEYWORDS

Audio Visual, Elementary Schools, Primary School

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INTRODUCTION

Primary school is a formal basic education levelstarting from the age of 7 years to 12 years. Primary schools provide basic education in the fields of science, arts, sports, social and culture (Bickford, 2020; Daniels, 2022; Go, 2021). At the elementary school level, children are active, creative, playful, and have the potential to develop themselves. Children at this level will experience different physical, cognitive, social, and emotional development according to age, talent, interest, and a supportive environment (Brisk, 2022; Fauziyah, 2020; Goodwin, 2022). This is a must, the learning process in elementary schools must pay attention to the principles of learning to suit children. The learning process in elementary schools must also use appropriate methods, media, and strategies in the learning process. Math learning that is often disliked by children because it is boring and difficult can be overcome. The use of media in the form of audio visual, problem-based learning, cooperative learning, and others can be used.

Audio visual is a media that has sound and images in one presentation. Audio visual as a media can provide information, knowledge, ideas, and ideas (Abali, 2023; Albus, 2023; Almeida, 2020) In addition to education, audio visual media is used for business, as well as entertainment. Learning that uses audio visual is a form of utilization as a tool to help students understand learning materials (Barrios-Rubio, 2021; Batur, 2023; Can, 2022). It will also help teachers to present learning materials more interestingly. The use of audiovisual media is able to increase student motivation, interest, and achievement in learning, as well as overcome various obstacles in the communication process between teachers and students (Alraqiq, 2021; Barhoumi, 2023; Chin-Cheng, 2022). There are various kinds of audiovisual media presentation, ranging from video recordings, movies, animations, streaming videos, and many more. Audio-visual media is a special attraction because of the presentation in the form of moving and sound images that are in accordance with the subject matter.

Effectiveness is a level of success in achieving goals that have been designed and set beforehand. Effectiveness can be measured by comparing results with what is expected (Ambarwati, 2019; Rahim, 2020; Saputri, 2021). Effectiveness in the use of audiovisual media to improve student achievement in mathematics learning is how much audio visual is able to contribute to improving student achievement in learning mathematics. In addition, it is also how much influence the use of audiovisual media has in helping students understand mathematical concepts to improve student learning outcomes (Kurniasih, 2021; Masrifah, 2022). In increasing the effectiveness of using audio-visual media in learning mathematics, teachers must be able to adapt the media to the objectives, material, and characteristics of mathematics learning. Analyze how appropriate and relevant the use of audiovisual media is in learning mathematics. The selection of audio-visual media that is in accordance with the conditions and facilities available can facilitate access and operation by both teachers and students. Elementary school children who are still underage must be given appropriate guidance, direction, and feedback. The use of audiovisual media must be accompanied by explanations, questions, exercises, and evaluations that can help students understand mathematical concepts.

Research on the effectiveness of using audio-visual media in improving student achievement in learning mathematics in elementary schools has deep reasons to be researched. The reason is in the form of knowledge of how effective the use of audio-visual media is in learning mathematics in elementary schools. This statement will also have an impact on increasing or decreasing the quality of learning and student achievement. In addition, the use of audio-visual media makes math learning more lively and interesting. So that students do not feel bored and bored during learning. On the other hand, the teacher will present a method or learning event that is not monotonous, so that what the teacher says is easily accepted and understood by students. The more students understand the use of

audio-visual media well, the chances of increasing student achievement in mathematics learning will also increase. Understanding difficult concepts will be easily digested by students and can be played repeatedly.

The effectiveness of using audio-visual media in improving student achievement in learning mathematics in elementary schools will play an important role in improving the quality of education. Audio visual media has an important role in improving student achievement. Audio visual as media is able to help students understand learning materials more easily. This is because it can display concepts in accordance with the steps and in accordance with real phenomena. Audio visual media can also improve student memory because it can stimulate students' senses of hearing and vision simultaneously, thus improving students' cognitive and affective abilities. This will provide an illustration to mathematics teachers in the use of audio-visual media in learning to match the concepts and learning materials.

This research will make a significant contribution to the effectiveness of using audio-visual media in improving student achievement in mathematics learning in primary schools. The use of audiovisual media can help students achieve better learning outcomes. The effectiveness of using audio visual media will also lead teachers as educators to educate and teach more effectively and efficiently. The quality of learning will also be influenced by the quality of learning media. Audio visual media will be able to help schools or educational institutions improve the quality of education. This will also affect the image or good name of the school. Increased student achievement will also affect the fame of the school, as well as the ability of the school to compete with other schools both at domestic and foreign levels. This research will identify the benefits of using audio-visual media in learning mathematics. The obstacles that occur when using audio visual media will also be presented. This will help teachers as well as students to overcome the risks and problems that occur when implementing learning using audio visual media. So that teachers will also be able to compare the effectiveness of using audio visual media in improving student learning achievement in mathematics learning.

This research provides new innovations, namely the effectiveness of using audio-visual media in improving student achievement in learning mathematics in elementary schools. In research (Azizah, 2021) with the title "Effect of Collaboration the STAD with Audio Visual Media on IPA Knowledge Competencies of VII Class SMP Negeri 32 Padang". The research focuses on the effect of audio-visual media collaboration which will affect science knowledge competencies at the junior high school level. The innovation of the research being conducted is the focus on the use of audio-visual media in learning mathematics in elementary schools whose effective use will affect student achievement. The difference from this study refers more to the subject and also the intended school level.

Considering the existing reasons, the researcher aims to answer several questions that arise. First, can the use of audio-visual media improve student achievement in learning mathematics in elementary schools? Second, are there obstacles and challenges that occur when using audio-visual media in learning? Third, is the use of audiovisual media effective for improving student achievement in mathematics learning in elementary schools? The researcher hopes that with this research every audiovisual media user can use wisely. The proper use of audiovisual media by teachers in learning will be able to improve the quality of learning and understanding in students. In addition, hopefully this research will be able to provide assistance in dealing with, analyzing the obstacles and challenges that occur in the use of audiovisual media. The researcher hopes that this research can be taken into consideration for further research. Hopefully, further research can explore the discussion of this research.

RESEARCH METHODOLOGY

Research Design

This research uses a quantitative design. A study with the presentation of data in the form of numbers. The questions presented amounted to 20 items which will be inputted into google from as a medium between the subject and the researcher. the use of google from is relatively easy to access and easy to share. So that there is fast and efficient feedback (Chapelle, 2020; Chen, 2022). In this case, the questions inputted were about the effectiveness of using audio-visual media in improving student learning achievement in learning mathematics at elementary schools. This method is used for the ease of formulating the results of statements and views from selected respondents on the effectiveness of using audio-visual media. This quantitative method is a form of presentation or data collection in the form of numbers that can be measured. The stages of research by submitting a questionnaire via whatsapp will make it easier for subjects and researchers to communicate without having to meet face to face. The results of the questionnaire distribution will be managed in SPSS. Researchers will review the highest answers.

Research Procedure

This study conducted a series of systematic steps to collect, analyze, and provide understanding of the data collected. This research begins with a request for permission from the teacher and also students who will be given statements. Furthermore, each question is translated into a table in the form of a percentage. The process of collecting data until the acquisition of responses in filling out the questions is considered fulfilled. On the other hand, the researcher presents the questions using good and correct language so that it is easily understood by both teachers and students. So that the collection can be done quickly and does not take much time. This process will make it easier for research to test data and examine the various advantages and problems that occur when using audio-visual media.

Research Subjects

The research subjects were teachers and students at the elementary school level who were randomly selected. The researcher acts as a collector of every answer given by teachers and students to the questions asked. This research will be very important to find the effectiveness of using audio visual media in math learning. In addition, it will also provide an overview of the advantages and disadvantages in the use of audio-visual media. This will provide an overview for teachers in increasing the effectiveness of using audio visual media. In addition, it can also be a reference in applying learning strategies when using audio visual media. This is a form of effort to anticipate the risks that will arise in the use of audio-visual media in learning mathematics and other learning.

Research Ethics

A research requires ethics in the process. Research ethics is a form of behavior shown by researchers when conducting research. The form of ethics is in the form of rules, principles, and norms that are used as a foundation when conducting research (Amato, 2020; Barroga, 2020). Research ethics will benefit both researchers and research subjects. A sense of comfort, security, and lack of discrimination against subjects and researchers will facilitate the research process. So that information can be conveyed and conveyed appropriately and more easily. This will facilitate the process of collecting data and information needed by researchers. This aspect contains consent and permission from individuals to conduct research. The data collected will be kept safe from the recognition of private property rights by others. The research will be conducted in a fair and impartial manner. Researchers will not impose their will on the subject so that there is no feeling of threat.

Furthermore, the researcher appreciates every response given and to all parties who have helped in the implementation of the research.

Data Collection Technique

In this study, the data collection process used Google from which aims to provide convenience in answering and recapitulating all the answers given by respondents. In addition, it will also save time and costs in collection. Because google from is shared in the form of a link via watsapp to the research subject. The collected data will be entered into a table with the responded answers in the form of a percentage on each question. The collected responded results are then inputted into excel to go to the next stage. At the next stage, namely entering data into SPSS to facilitate statistical calculations of the responded. Its usefulness is to see the response of the subject to the analysis of the effectiveness of audio-visual media in improving student achievement in learning mathematics in elementary schools.

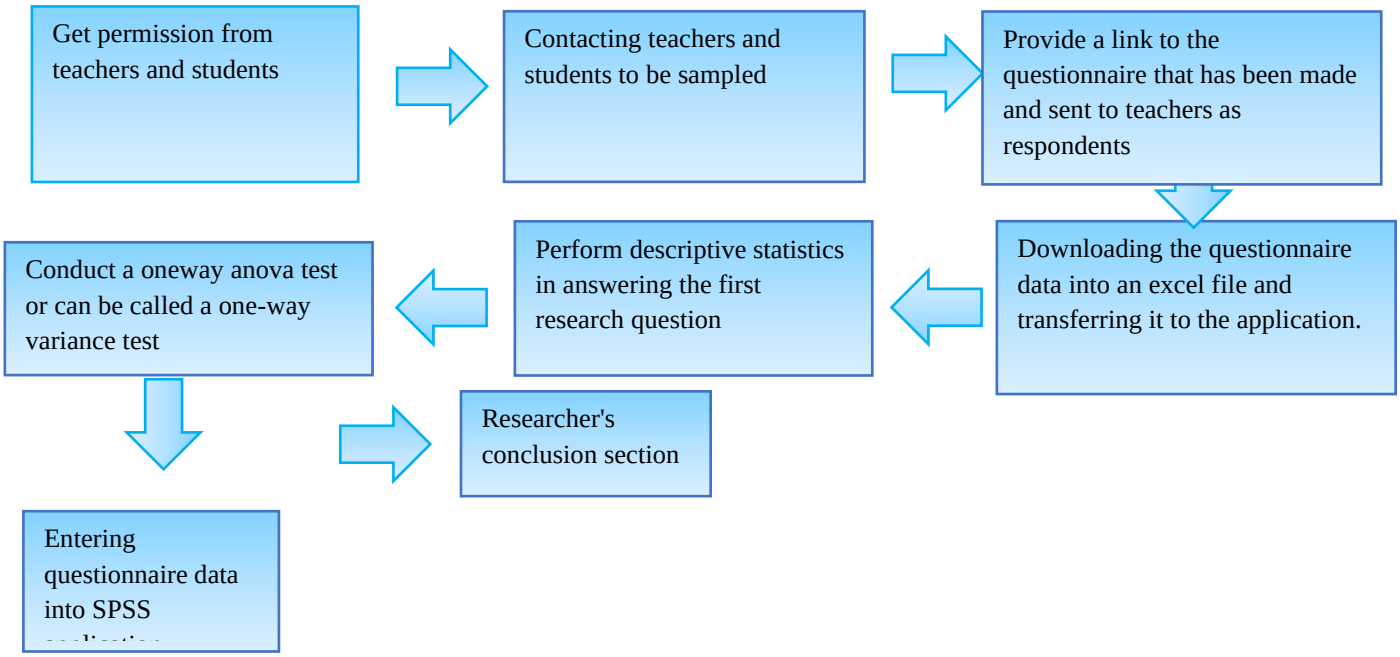
Table 1 Sample Population

NO	**Department of**	Number of Participants	Percentage
1.	Teacher	**10**	**40%**
2.	Students	**15**	**60%**

Table 1 Rincian Sampel Penelitian

No	**Choice Category**	Tier Number
1	Strongly Agree (5)	**>90%**
2	Agree (4)	**70-80%**
3	Disagree (3)	**50-60%**
4	Strongly Disagree (2)	**0-40%**
Total		**100%**

Figure 1 Data collection and data analysis tools



RESULT AND DISCUSSION

Audio visual media is a form of media that combines sound and images. It can be used to convey information or learning messages. This media can help teachers and students understand and remember mathematical concepts more easily, because it provides concrete and interesting visualizations. student involvement and motivation in learning mathematics can increase by using audio-visual media. This is because it is able to stimulate the various senses of students and provide opportunities to interact with teachers, friends, and learning materials. This media can enrich students' learning experience because it provides access to a variety of varied sources. Audio-visual media is also able to overcome differences in student learning, because it provides freedom of access and flexibility to choose and adapt media to the needs, interests and abilities of students.

Table 3 Teachers' responses to the effectiveness of using audio-visual media in improving student achievement in learning mathematics at primary school.

NO	Question	SS (%)	S (%)	TS (%)	STS (%)
1	The use of audio-visual media helps students understand math concepts better.	56%	44%	0%	0%
2	With audio-visual media, students are more engaged in learning math in class.	56%	37%	6%	0%
3	Teachers see an increase in student achievement after implementing audio-visual media in teaching mathematics.	50%	50%	0%	0%
4	Visualization of mathematical concepts through audio visual media facilitates students' understanding of the material.	63%	37%	0%	0%
5	Audio-visual media provides variety in math learning so that students do not feel bored	50%	47%	6%	0%
6	The use of audio visual media helps overcome students' various learning styles	56%	44%	0%	0%
7	Students are more enthusiastic and focused when the material is presented through audio visual media	63%	37%	0%	6%
8	The use of audio visual media expands students' learning experiences through the use of technology.	56%	48%	0%	0%
9	Students feel more connected to the mathematics material because of the supporting visualization	50%	44%	6%	0%
10	Audio visual media helps create a dynamic and interactive learning atmosphere	63%	37%	0%	0%

The explanation of the table above is the result of the teacher's response to the statement submitted. The highest statements with the percentage of strongly agree 63% and agree 37% are in statements 4, 7, and 10. In statement 4 regarding Visualization of mathematical concepts through audio-visual media facilitates students' understanding of the material. This is because visualization of mathematical concepts can increase student learning motivation. In addition, visualization can enrich students' knowledge and understanding of mathematical concepts. In item 7 regarding Students are

more enthusiastic and focused when the material is presented through audio visual media. This reason is still about the presentation of audio-visual media that is creative and varied so that it captivates students to see it. This will increase students' learning motivation and provide positive feedback on learning.

Table 4 Student responses to the effectiveness of using audio-visual media in improving student achievement in learning mathematics at primary school.

NO	Question	SS (%)	S (%)	TS (%)	STS (%)
1	Students understand math lessons more easily when teachers use audio-visual media	56%	44%	0%	0%
2	The use of videos and images makes math material more interesting and memorable	69%	31%	0%	0%
3	Students feel more confident in doing math problems after seeing visualization of concepts through audio visual media.	63%	37%	0%	0%
4	Math learning becomes more fun because of audio visual media.	63%	37%	0%	0%
5	Students are more interested in learning math because they can see the real application of the concepts taught.	56%	44%	0%	0%
6	With audio visual media, students can clarify their understanding of difficult concepts.	56%	44%	0%	0%
7	Students feel more motivated to learn math because they can see how the concepts are applied in everyday life	50%	50%	0%	0%
8	The use of audio visual media makes the learning atmosphere more interactive and fun	63%	37%	0%	0%
9	Students feel more involved in learning math when teachers use audio visual media	56%	37%	7%	0%
10	Audio visual media helps students prepare well for math exams	50%	6%	0%	0%

The table above is the result of students' responses to the effectiveness of using audio-visual media in improving student achievement in learning mathematics in elementary schools. The statement that has the highest response is item number 2 with 69% of responses strongly agreeing and 31% agreeing. This statement regarding the use of videos and images makes math material more interesting and easy to remember. This reason is based on the fact that videos and images can attract the attention of students who present with a more lively, interactive, varied, and creative character. Audio-visual media can also provide a connection between ideas, real examples, or stimulation that is relevant to the material. In addition, it can increase student learning motivation, because it provides feedback, order, and appreciation. In addition, this media can help retain old information due to the activation of students' visual memory.

Table 5 Teachers' responses to the effectiveness of using audio-visual media in improving students' achievement in learning mathematics at primary school using the oneway anova test.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
X.1	Teacher	2.400	3	.800	.	.
	Guru	.000	6	.000		
	Total	2.400	9			
X.2	Teacher	4.400	3	1.467	.	.
	Teacher	.000	6	.000		
	Total	4.400	9			
X.3	Teacher	2.400	3	.800	.	.
	Teacher	.000	6	.000		
	Total	2.400	9			
X.4	Teacher	2.100	3	.700	.	.
	Teacher	.000	6	.000		
	Total	2.100	9			
X.5	Teacher	4.500	3	1.500	.	.
	Teacher	.000	6	.000		
	Total	4.500	9			
X.6	Teacher	2.100	3	.700	.	.
	Teacher	.000	6	.000		
	Total	2.100	9			
X.7	Teacher	2.100	3	.700	.	.
	Teacher	.000	6	.000		
	Total	2.100	9			
X.8	Teacher	2.100	3	.700	.	.
	Teacher	.000	6	.000		
	Total	2.100	9			
X.9	Teacher	8.400	3	2.800	.	.
	Teacher	.000	6	.000		
	Total	8.400	9			
X.10	Teacher	2.100	3	.700	.	.
	Teacher	.000	6	.000		
	Total	2.100	9			

The table above is a sample of responses from teachers that have been processed into SPSS. Total sum of squares 2,200, df 9, and mean squares 0.700, with F and Sig none. This is found in the 10th statement regarding audio visual media helping to create a dynamic and interactive learning atmosphere. Audio visual media is a tool that combines two forms of media, namely images and sound into the learning process, such as videos, animations, and others. This media will be very useful for educators to improve understanding, attract student attention, and create an interactive atmosphere. It will also be able to improve students' competence in mathematics learning.

Table 6 Student responses to the effectiveness of using audio-visual media in improving student achievement in learning mathematics in elementary school oneway anova

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
X.1	Students	3.429	5	.686	.	.
	Students	.000	8	.000		
	Total	3.429	13			
X.2	Students	2.857	5	.571	.	.
	Students	.000	8	.000		
	Total	2.857	13			
X.3	Students	3.214	5	.643	.	.
	Students	.000	8	.000		
	Total	3.214	13			
X.4	Students	2.857	5	.571	.	.
	Students	.000	8	.000		
	Total	2.857	13			
X.5	Students	3.214	5	.643	.	.
	Students	.000	8	.000		
	Total	3.214	13			
X.6	Students	3.214	5	.643	.	.
	Students	.000	8	.000		
	Total	3.214	13			
X.7	Students	3.429	5	.686	.	.
	Students	.000	8	.000		
	Total	3.429	13			
X.8	Students	2.857	5	.571	.	.
	Students	.000	8	.000		
	Total	2.857	13			
X.9	Students	5.429	5	1.086	.	.
	Students	.000	8	.000		
	Total	5.429	13			
X.10	Students	5.500	5	1.100	.	.
	Students	.000	8	.000		
	Total	5.500	13			

In the table above is the acquisition of responses from students on the effectiveness of the use of audio-visual media in increasing student achievement in learning mathematics in elementary schools. The total sum of squares is 5,500, df 13, mean squares 1,100, with F and Sig none. This statement is about audio-visual media helping students prepare well for math exams. This reason is supported by an increase in student learning motivation because it can attract attention, arouse curiosity, and provide variety in learning. Audio visual media can enrich students' knowledge and understanding of mathematical concepts. This is because it displays directly, concretely, and visually the form of formulas, graphs, diagrams, or others. Another thing that also supports is improving students' learning skills and achievements in mathematics. This is because it is able to provide practice problems, feedback, and interactive assessments that are challenging and fun.

Audio visual media is a medium that combines sound and images in the presentation of information, learning materials, knowledge, ideas, or ideas. Audio visual media is media that can be seen and heard presented in a more interesting and communicative form. The learning process has different methods and media. The use of audio-visual media as a tool to present information, understanding of concepts, and various forms of example problems in accordance with student learning material. The use of audio-visual media will create its own attraction due to an interesting and not monotonous presentation. Audio visual media has many types, ranging from video recordings, movies, animations, and even video straiming. In addition, visual media also have broadcasts at a certain time, such as national television broadcasts, local, news, talk shows that cannot be replayed by individuals. The appearance of moving and sound audio-visual media in accordance with the learning material will make it easier for students to follow the learning flow. In addition, audio-visual media such as educational television will provide actual, interactive information to students. So that this can increase the insight of students, although sometimes it is difficult to adjust it to the learning material at school.

The use of audio visual media in learning will provide learning experiences that sometimes cannot be seen directly, such as natural disasters, culture, history. The use of audio visual media that is presented attractively will captivate students when they see it. So that students' interest in learning will increase, motivation and achievement will also change. Forms of learning that have limited space, time, and senses will be implemented with audio-visual media. Visual media will bring and present to students the real form of things that are being studied. The success in achieving learning objectives depends on how efficient the use of audio visual media in learning. The effectiveness of using audio visual media in learning can be seen, tested, or compared from before using and after using the media. Appropriate placement of audio visual media will help teachers and students in achieving the desired learning competencies.

Increasing the effectiveness of using audio-visual media in learning mathematics can be through adjusting audio-visual media with the material to be learned by students. Presentation is also interesting, but it should not be excessive so that student focus remains under control. Selection of media that is in accordance with the facilities so that it can be presented properly to students. So that it will be able to be accessed and operated properly by teachers and students during learning. Creativity and innovation from the creation of audio-visual media must be increased. This is useful so that there is no monotony in the presentation. Interactive media will also be able to help students' understanding become deeper. So that students can also participate in learning. This will create an active and lively learning atmosphere.

The use of audio-visual media will be able to improve student achievement in learning mathematics in primary schools. Audio visual media can help students understand and remember mathematics concepts more easily. This is because audio visual media provides concrete and interesting material. Elementary school students who are classified as active and do not like boring things will like the use of audio visual media. This media will provide information and direction to students. So that students will play a direct role in solving problems in the mathematics material. This media will increase students' involvement and motivation in learning. The presentation of learning materials that are able to stimulate students' senses and provide opportunities or opportunities to interact with friends, teachers, and learning materials. Differences in student learning styles will be overcome with audio-visual media. This will enrich students' learning experience. This media will provide varied learning resources depending on the selection, because the media will provide flexibility and freedom for teachers and students to choose.

The use of audio-visual media that requires tools will be an obstacle. Barriers that often occur are difficulties or damage to media tools or devices, such as internet connections, projectors, speakers, laptops, and other digital tools. Limited resources, both natural and human, will affect the effectiveness of using audio-visual media. Not all areas have electricity, not all areas have internet access, and not all areas have adequate equipment. This will be an obstacle in accessing and selecting audio visual media used by teachers. In addition, the lack of knowledge and skills of both teachers and students in using the media will hinder the achievement of competencies. This is because there will be errors, inefficiency, and incompatibility with learning materials. The decline in quality and relevance that occurs due to the incompatibility of media with the objectives, materials, methods, and desired achievements.

The use of audio-visual media that presents information using sound combined with images will be able to improve student achievement in learning mathematics at primary school. This media will help students understand and remember maths concepts more easily. Increased student engagement and motivation will affect student achievement. Because audio-visual media will stimulate students' various senses. Diverse learning experiences will enrich students as they have access to a variety of sources. In addition, audio-visual media will overcome the different learning styles of students. So that students become more flexible and enjoy. So that the learning delivered will be easily accepted by students.

The use of audio-visual media also has the disadvantage that it requires large costs for manufacturing, duplicating, and maintaining. In addition, the tools used are fairly sophisticated and the costs are quite large. The design, operation, and use of media also require special skills. So that students and teachers are required to be able to manage audio-visual media. Improper use will also cause misunderstanding and confusion. Health risks for teachers and students are also threatened, such as eye pain, headaches, hearing loss, and many more. The dependence on audio-visual media can be a problem. The tendency of teachers and students to use audio-visual media in mathematics learning will reduce the ability to think, communicate and socialise independently.

CONCLUSION

Audio visual media is a media that combines sound and images in the presentation of information, learning materials, knowledge, ideas, or ideas. Audio visual media is media that can be seen and heard presented in a more interesting and communicative form. Audio visual media can improve student achievement if used effectively. Audio visual media plays a role in increasing students' interest and motivation towards mathematics. This is because the appearance of audio visual media is interesting, varied, and interactive. Understanding mathematical concepts, principles, and formulas will also be easy for students to understand. Audio visual media can be used in various types such as film, video, television, sound slides. To measure the effectiveness of using audio-visual media in learning mathematics, you can use the test questions that have been studied. In addition, it can also be by determining learning objectives and indicators, compiling assessment instruments, conducting media trials, implementing learning.

Inappropriate use of audio-visual media will result in many problems. Starting from the confusion that occurs in understanding mathematics material. Errors that will often occur, ranging from the use of the wrong media, inappropriate material, to problem solving methods that are difficult to understand. The use of audio-visual media also requires a fairly high cost. The use of tools in the presentation will incur considerable costs. The duplication of audio-visual media can also be hampered due to limited costs. In addition, uneven internet access in various regions will hinder the process of using audio visual media effectively.

AUTHORS' CONTRIBUTION

Author 1: Review; Editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

Author 4: Conceptualization; Project administration.

Author 5: Validation; Writing.

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