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Junior High School Teachers' Strategies in utilizing E-learning-based Audio-Visual Media in Science Learning at School

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ABSTRACT

Background: The rapid shift to digital learning during the COVID-19 pandemic has compelled educators to adopt innovative teaching strategies, particularly through the integration of e-learning-based media. One such approach involves the use of audio-visual media to enhance the effectiveness of science education. **Objective:** This study aims to determine the teacher's strategy in utilizing e-learning-based audio-visual media at SMP Negeri 12 Cimahi in learning Natural Sciences. **Method:** This study used a qualitative approach with a field research method. Data collection was done through observation, interview, and documentation. Data validity was tested through credibility, transferability, dependability, and confirmability tests. The data obtained were analyzed through data processing, classification, interpretation, and conclusion drawing. **Results:** The use of audio-visual media during the COVID-19 pandemic at SMP Negeri 12 Cimahi has been running well in online and offline learning. **Conclusion:** E-learning-based audio-visual media has proven effective in increasing student engagement, clarifying complex concepts, and increasing learning motivation. **Contribution:** This study contributes insight into the importance of using e-learning-based audio-visual media in improving the effectiveness of science learning, especially in emergencies such as a pandemic.

1. INTRODUCTION

The development of science and technology in the Millennial Era has had a significant impact on all areas of human life, including education (Juliawan et al., 2021). All fields including education should take advantage of advances in science and technology to achieve their goals effectively and efficiently. During the COVID-19 pandemic, the use of technology-based media has an important role to play in facilitating learning activities at home (Wardhani & Krisnani, 2020), through the use of teaching aids (learning media) that are adapted to conditions and facilities that can be utilized by teachers, students or guardians of students at home and in general the tools used today are Smartphones via the Whatsapp Group application (Fadila et al., 2021).

The impact of the COVID-19 pandemic has changed teaching and learning activities that were originally carried out in schools, now available for online learning at home (Baety & Munandar, 2021). Online learning is based on the capabilities of each school. Online learning can use digital technology, such as Google Classroom, self-study room, zoom, video fusion, telephone, or real-time chat via WhatsApp, etc (Basar, 2021). Smartphones are the main element

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as important tool that is useful for learning. However, what must be done is to monitor teacher guidance through the WhatsApp group to give homework so that children can learn (Putri & Nurafni, 2021). In addition, teachers can also collaborate with parents at home through video calls or photos of children's learning activities at home to ensure interaction between teachers and parents. For this reason, to increase effectiveness and efficiency in online learning during the COVID-19 pandemic, it is necessary to develop various learning models using creative and innovative learning media (Marsiding, 2020). This needs to be done so that the distance learning process does not look less interesting, watchable, and boring which hinders the knowledge transfer process (Rosyada et al., 2021). Therefore, the role of media in the learning process is very important, because it will make the learning process more diversified and reduce boredom.

In the learning process, communication is established between students and their environment, both in group areas and social areas (Hudah et al., 2020). Through learning it is hoped that there will be a change in students' attitudes toward maturity, both physically, intellectually, mentally, morally, or socially (Syahroni et al., 2020). Education through the learning process is a conceptual and detailed effort in the learning process where there is reciprocal interaction and communication between teachers and students using learning resources (Gunawan & Amaludin, 2021), learning media that are relevant to existing circumstances and conditions, for example when Currently, the world is facing an epidemic which causes the teaching and learning process to be diverted at home by utilizing various existing scientific and technological advances, so that teachers, students, and parents are forced to be addicted to the current conditions (Abdullah, 2017). Then by evaluating the attitudes, knowledge, and skills acquired by students after participating in the learning process and interacting with the teaching and learning process, the results can be seen. Among them are various learning media designed to stimulate learning motivation, so that the teaching and learning process can run well, and can achieve the goals of the teaching process itself, so that it has an impact on student learning outcomes or academic achievement (Mukholifah et al., 2020). It also aims to create a meaningful, active, effective, and efficient teaching process.

In addition, a teacher is required to be able to use media that can be provided by the school, and this media can keep up with the times (Munisah, 2020). Learning media is an important supporting factor in improving the learning process (Wahyuningtyas & Sulasmono, 2020). There are two very important elements in learning, namely teaching methods and learning media (Rejeki et al., 2020). Technological developments also play an important role in the learning process (Fadhli, 2016). The use of assistive devices is very helpful in teaching and learning activities, especially in efforts to improve student academic achievement (Harsiwi & Arini, 2020). The use of learning media also determines the success of learning and improves the quality of learning. During the COVID-19 pandemic, the role of the media is very much needed in the learning process. Media is not only a tool but also an integral part of the education and learning system (Andrijati, 2014). Therefore, teachers are required to be able to use tools that can be used by everyone (Salsabila & Aslam, 2022) be it schools, teachers, students, or guardians of students. These tools can meet the development and requirements of the times. One of them is the use of audio-visual media.

Learning media has a great influence on student success in certain subjects. It can be said that this is a packaging material that makes it easy to understand, interesting, and not boring so that it can achieve the goals being taught (Nurrita, 2018). Learning media is usually used as one of the parameters to understand the extent to which students can easily and happily accept and apply the material introduced by the teacher (Ekayani, 2017). The application of media used interesting learning media will overcome student boredom; therefore, it can be said that learning media has a great influence on student understanding (Sunaengsih, 2016). A good teaching process can create an effective teaching process through two-way communication between teachers and students,

Based on preliminary observations made at SMP Negeri 12 Cimahi, the authors observed that natural science teachers often could not make the most of the WhatsApp Group application to use audiovisual learning media. In the conditions of online learning during the Covid-19 pandemic, if natural science is conveyed inappropriately it will be very exciting and arouse students' curiosity, the result can be very boring. Several problems cause students to have difficulty accepting subject matter including (1) in teaching the teacher is too short and fast in delivering explanations; (2) students' enthusiasm in participating in the online learning process is still relatively passive, this is evidenced by the lack of student response to the teacher's explanation; (3) not all students took part in the teaching and learning activities. This was evident from the number of students who saw the explanation sent by the teacher via the WhatsApp group; (4) students are not involved in explaining the material, the teacher does not give time for students to ask questions, the examples given by the teacher are not supportive so that the reciprocal relationship between students and teachers in the online learning process does not occur as it should.

Identification of problems based on observations at SMP Negeri 12 Cimahi found five problems including (1) during the Covid-19 pandemic, learning media was not utilized when studying online; (2) online learning is still monotonous; (3) students' enthusiasm is still low due to the lack of teachers in utilizing learning media; (4) there is

still a lack of educator knowledge in utilizing technology-based learning media in the teaching and learning process; (5) the lack of variation or creativity of teachers in the use of learning media.

From the description above, it can be seen that through the needs and developments of the current era, such as the Covid-19 pandemic, the enthusiasm and effectiveness of learning media learning activities need to be realized optimally. Therefore, audio-visual media is one of the essential educational media (Herlina, & Suherman, 2020) so that students can play an active role in the learning process. Audio-visual media was chosen as one of the most effective methods for solving problems related to understanding advanced scientific material at the basic level (Firmansyah & Kardina, 2020). Therefore, the research that will be carried out by researchers is regarding the use of audiovisual learning media through digital media such as WhatsApp, Zoom,

The purpose of this study was to determine the strategies of junior high school teachers in utilizing audio-visual media based on e-learning at SMP Negeri 12 Cimahi. The focus of this research focuses on (1) efforts to find out the use of audio-visual media in learning natural sciences in schools; (2) find out the obstacles encountered in the use of audio-visual media in learning natural sciences at school; (3) find out how to overcome the obstacles encountered in the use of audio-visual media in learning natural sciences at school.

2. METHOD

2.1 Research Approach

In this study, the researcher used a type of field research, namely research that requires researchers to go directly to the field to conduct research. The approach used is a qualitative approach with a descriptive method, namely a study that describes an event or symptom that is happening at this time. Following the title of this study, namely describe the use of audio-visual media in learning natural sciences during the Covid-19 pandemic at SMP Negeri 12 Cimahi. The research approach used is a qualitative method, with a descriptive research method. Qualitative research procedures, produce descriptive data in the form of written or spoken human expressions and observable behavior. Qualitative research refers to research in which the researcher engages in research using observation, interviews, content analysis, and other collection methods to introduce the reactions and behavior of the subject.

2.2 Participants

This research was conducted at SMP Negeri 12 Cimahi, the subjects of this study were the principal, class teachers, and students of SMP Negeri 12 Cimahi. The research subjects were used as primary data, the subjects were used as informants and report providers to obtain information directly based on events or facts on the spot. Obtained data related to how educators use audiovisual media as scientific teaching materials. This information is useful for the student learning process when using smartphone technology to deliver material and assignments through the WhatsApp Group.

2.3 Instruments and Data Collection

Research instruments are tools used in research to collect and obtain data so that research can be carried out easily. Data collection techniques are the most strategic step in research, because the main purpose of research is to get data. Without knowing the data collection technique, the researcher will not get data that meets the established data standards. The process of collecting data uses three methods, namely (1) observation, which is direct observation of things that are happening or are happening so that these observations merge with the things being studied; (2) interviews, namely direct conversations with research subjects utilizing research questions that have been prepared, interviews are conducted to dig deeper into data information; (3) documentation, namely additional data collected to improve observation and interview data. The file is a valid event review.

Checking the validity of the data is carried out to prove whether the research being carried out is truly scientific research as well as to test the data obtained. Data validity tests in qualitative research include credibility, transferability, dependability, and conformability. The steps for checking the validity of the data in this study include (1) checking the integrity of the data; (2) displaying data, namely presenting data in research notes in several formats as needed; (3) validating data and concluding, namely explaining the processed data, then comparing it with generally accepted normative theories and regulations and set as the conclusion.

2.4 Data Analysis

After checking the validity of the data has been completed, the next step is data analysis. Data analysis was carried out by arranging data from general to specific. Data analysis technique is an activity of examining and

analyzing the research instruments used in a study (Utomo et al., 2024). In simple terms, qualitative research data analysis techniques can be carried out in several stages including (1) editing, improving data; (2) data classification; (3) explanations; (4) conclusion.

The data analysis technique has several steps or stages that need to be carried out properly and correctly, as for the stages are as follows:

a) Data processing, which is the process of processing data that has been collected. Data processing consists of several stages, namely editing and coding;
b) Data analysis, which is the process of finding data and determining test hypotheses. Once the data is clearly classified, data analysis can be done to find patterns;
c) At this stage there is a notable difference between quantitative and qualitative research. Quantitative research generally applies statistics. While qualitative research applies coding. Both can be done manually or with the help of computer software;
d) Verification or conclusion drawing, aims to find conclusions from research activities. The conclusion is drawn by comparing the description that has been formulated with the results of the data analysis that has been obtained, so that in the end the researcher can conclude whether to accept or reject the assumption that has been formulated.

3. RESULT AND DISCUSSION

3.2 Result

According to previous findings, it can be seen that teachers, parents, and students use WhatsApp digital audio-visual media for learning from home and it is very useful for subjects that require more detailed explanations such as natural science subjects.

First, the utilization of audio-visual media. The learning system at SMP Negeri 12 Cimahi during the learning process during the Covid-19 pandemic took place using two learning systems, namely online and at school. Audio-visual media is very useful for teachers who teach and students who are taught because digital audio-visual media has a feature to be able to send learning images or videos via android phones so that the utilization of digital audio-visual media can represent the presence of teachers as teachers and students who are taught in the midst of the online learning process from home. Digital audio visual media is also very useful for teachers to convey material that cannot be conveyed directly due to the pandemic, such as in natural science subjects where children should conduct experiments or practicums from certain natural science materials, but because of this pandemic these activities must be eliminated, for this reason the role of audio visual media is very useful because teachers can explain these activities by sending learning videos through the Whatapp group so that children can download or watch them on YouTube and practice them at home with parents, then send pictures of the results of their reports through the Whatapp group.

Second, constraints in the use of audio-visual media. There are obstacles encountered in the learning process, including (1) problems related to teacher abilities; (2) there are differences in the level of students' understanding; (3) parents who don't have cell phones and don't understand how to use them; (4) collaboration with parents of students who are still lacking. Constraints in the use of audio-visual media during online learning are also experienced by students and parents at home, this can be seen from the results of interviews with students and parents.

Third, the solutions adopted to solve the problem of learning from home include (1) attending training on information technology or studying with peers, for educators; (2) strengthening students' understanding in class which is done once a week; (3) utilizing media that can be used by all parties, both from the school, teachers, students, and parents; (4) improve the quality of communication and cooperation with parents. This is very important for elementary-level students. Giving certain assignments by the teacher must be followed by supervision of the completion of the assignment by parents at home because children's learning time is dominated at home.

The results of the study show that the impact of the COVID-19 pandemic has changed teaching and learning activities that were originally carried out in schools to now be available for online learning at home. Online learning is based on the capabilities of each school. Online learning can use digital technology, such as Google Classroom, self-study room, zoom, video fusion, telephone, or real-time chat via WhatsApp, etc.

3.2 Discussion

The findings revealed that the learning process activities at SMP Negeri 12 Cimahi during the Covid-19 pandemic took place using two learning systems, namely online and at school. The learning process, which was

initially carried out in the classroom, has changed in line with government policies to limit work, study, and worship activities from home. This policy forces all parties to be addicted because it is in a pandemic condition so the use of audio-visual media in the online learning process creates many obstacles for the school, teachers, students, and parents.

Other findings also reveal that parents who do not have an internet network and lack knowledge of teachers and parents in using technology so that schools are only able to use WhatsApp groups as a learning medium that all parties can use, not every child has a cell phone to follow the learning process through audio media. The visual that is used, namely WhatsApp groups, makes it difficult for children and parents to study, the need for a quota to access the internet makes parents complain because of their large expenses, parents who are busy with their work at home make parents not always able to accompany their children learn optimally, then the lack of understanding of parents in using gadgets than their children so that when studying at home children tend to play games, or watch other videos from YouTube rather than study or do their assignments, so many parents complain because they are forced to do their children's assignments and decreased student learning outcomes under the minimum completeness criteria.

The solution to overcoming teacher abilities is to improve teachers' teaching abilities during the coronavirus outbreak, even teachers have made various efforts to overcome this ability. Then the school also established a policy to hold classes once a week in each class. This was done to find out firsthand the child's achievements or children's understanding during the learning process at home. In addition, overcoming differences in student understanding, and solving individual differences related to personality has become a way of thinking and class (Wajdi, 2021). To overcome student diversity in the online learning process, teachers and schools are looking for solutions so that students have the same understanding, namely paying attention to differences between students by stimulating students to continue learning (Hayati, 2021). However, by improving the quality of communication and cooperation with parents, being a parent has an important role in student development. For students, this is very important, because teachers have to supervise their parents' homework at home after completing certain assignments. After all, the time the child is at home dominates learning.

The Covid-19 epidemic has had a profound effect on human development. The Covid-19 epidemic is having a profound effect on every part of life. Education is an area that has been impacted (Siahaan, 2020). Classroom teaching and learning activities appear to be widespread, which is consistent with the government's strategy of working from home, studying, and praying. In other words, by allowing students to study from home, educators must ensure that teaching and learning activities continue regardless of where students study. Educators are undoubtedly obliged to innovate in terms of the use of learning materials. Related to the condition of the Covid-19 pandemic, changes in the use of educational media are urgently needed. In this case,

The online learning process is carried out via WhatsApp, video conferencing, Google Forms, or homework through special applications available (Handarini & Wulandari, 2020). The implementation of online learning allows students and teachers to study at their respective homes. Students can access topics and submit assignments given by teachers without having to meet at school. Taking this action can reduce the appearance of crowds in face-to-face learning because keeping a distance can prevent the spread of Covid-19 (Sadikin & Hamidah, 2020). Learning media is anything that can be used to convey information to students and stimulate the learning process (Aqib & Rohmanto, 2008). Media are various forms of stimulants and tools designed to encourage students to learn quickly, precisely, easily,

In the learning process, learning media functions as a container and distributor of knowledge; in this example, the instructor is the source of knowledge, and the students are the recipients. Everything can be used to involve students' ideas, emotions, attention, and willingness in larger learning media, thereby encouraging student learning (Susilan & Cepi, 2007). The function of learning media is to clarify the presentation of messages and information so that it can expedite, and improve learning processes and outcomes. In addition, learning media can increase and direct students' attention so that they can generate interest in learning, more direct interactions between students and their environment, and the possibility for students to study independently according to their abilities (Rahmi, 2021).

Learning based on audio-visual media can be used as a natural science learning strategy. It can be seen that audio-visual media is a type of media used in learning activities by involving hearing and sight as well as in one process or activity. Messages and information that can be channeled through this media can be in the form of verbal and nonverbal messages that rely on both sight and hearing (Rayandra, 2011). Meanwhile, according to Asra & Sumiati (2007), audio-visual media is media that can be seen and heard at the same time, such as sound films, videos, television, and sound slides.

Audio-visual learning media is an intermediary or message delivery from the sender to the recipient of the message in learning activities that involve both sight and hearing. The audio-visual media used by researchers here is a video that contains learning material, using videos students can see and hear the material (Asmara, 2015). Learning media must provide a pleasant experience and meet the individual needs of students. In the learning process, the media has a function as a carrier of information from the source (teacher) to the recipient (student). Audio-visual media is a means, intermediary, or delivery of messages (subject matter) delivered both from the teacher and actual reality (Fahreza & Julianda, 2018). Despite its position as a bridge between the source and the receiver, this audio-visual media can provide a stimulus to students to lead knowledge that is abstract, verbal, and visual symbols towards a concrete direction closer to actual reality. As a first step is the student's interest in learning (Fatimah et al., 2022). Interest can be formed from external factors, one of which is the use of audio-visual media which will help students build this interest in understanding lessons.

It should be noted that students' attention is focused on audio-visual media, students are asked to watch the video sent to the WhatsApp group until it is finished, then students are allowed to ask questions and respond to the videos sent, then the teacher holds discussions with students, students are quite active in the process discussion (Fujiyanto et al., 2016). This shows the attention of students and it can be said that audio-visual media can foster student learning interest. Even though it is simple, audio-visual media can convey the message conveyed by the teacher and can make students interested in the material presented by the teacher (Gabriela, 2021). Therefore, Teachers are expected to choose videos that will be given to students because not all videos can be used as media from lesson delivery and pay attention to video characteristics such as videos that are easy to understand or understand by students, videos are good spectacles according to the age of students and the most important thing is that videos are related to the subject matter to be conveyed.

Based on the discussion that has been revealed above, the findings show that the use of audio-visual media in the social science learning process can increase student motivation. Through audio-visual media, students will more easily understand the material if the teacher explains audio-visual media. In addition, audio-visual media also makes it easier for students to do assignments, so that students have more attention to the material.

4. IMPLICATIONS AND CONTRIBUTIONS

Research implications. The results of the research have implications and relevance to the learning process in schools, namely audio-visual learning media can also be used as an alternative medium for learning natural sciences, the role of using audio-visual media can display multifunctional and interesting motion pictures to be used as learning media. Through audio-visual media, teachers can convey messages quickly, and concisely and can be remembered by students, because the teacher's delivery attracts students' attention.

Contribution. This research contributes and contributes knowledge in both theory and practice regarding the role and use of audio-visual media as a medium for learning natural sciences for students in schools. The results of these findings are also novelty and can be used as a reference for further research regarding studies on the use of audio-visual media as learning media. The results of this study can be used as reference material so that researchers can carry out better e-learning-based activities and can develop creative ideas related to audio-visual learning media that can increase student motivation and quality.

5. LIMITATION AND FUTURE RESEARCH DIRECTIONS

From the overall process of conducting research, there are several limitations in this development research, including (1) limited theoretical studies regarding audio-visual media, so in this research theoretical studies are still limited and lack references; (2) researchers have difficulty in obtaining appropriate picture and video illustrations for the material the researcher wants; (3) the condition of students when collecting data regarding student responses was not conducive so that the results obtained were less than optimal.

Research Recommendations. Schools should provide intensive training for teachers on using technology and e-learning-based audiovisual media to help them teach more effectively. Additionally, regular evaluations should be conducted to assess the effectiveness of audiovisual media in learning, identify challenges, and find solutions to overcome them.

6. CONCLUSION

The use of audio-visual media during the Covid-19 pandemic at SMP Negeri 12 Cimahi, especially in natural science subjects, has been going well, not only implementing the online learning process but also in class so that

assignments and giving material in natural science lessons cannot be explained directly can be overcome by utilizing audio-visual media. The use of audio-visual media in the learning process during a pandemic at SMP Negeri 12 Cimahi has been carried out based on the capabilities of all teachers, students, and guardians of students, namely only by utilizing the audio-visual media WhatsApp Group.

Suggestions and recommendations. Based on the results of the analysis and discussion of the research, the following are suggestions and input that researchers can provide from the results of this study. First, for principals and teachers. For the learning process during an epidemic to achieve its goals optimally, educators should further develop their abilities, one of which is skills in operating audiovisual media. Second, parents should learn to use technology at home and pay more attention to their child's learning process so they can monitor the development of their child's learning process at home. Third, for students. Students are expected to continue learning and not play too much with friends. Fourth, for future researchers.

Using e-learning-based audiovisual media has been proven to enhance student engagement, clarify complex concepts, and help students understand the material better than conventional methods. E-learning-based audiovisual media can also boost students' motivation to learn, especially when combined with interactive and engaging strategies. This has a positive impact on their learning outcomes.

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Author Contribution Statement

All authors discussed the results and contributed to the final manuscript. The first and second authors fully contributed to the implementation, preparation, and completion of the research report. Therefore, all data contained in this article are original and can be accounted for by the authors.

Conflict of Interest Statement

The author declared no potential conflicts of interest with respect to the article. This research has become a collaborative activity that is routinely carried out by researchers every year.

Ethical Approval Statement

The author declares that this study was conducted in accordance with research ethics principles and has received ethical approval from the author's institution, including respect for participants' autonomy, confidentiality of data, and ensuring their safety and well-being, as outlined in the applicable research ethics guidelines.

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