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Utilization of video-based learning media in Biology Lessons at MAN 1 Semarang

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ABSTRACT

This research was carried out with the aim of producing learning media using the Quizizz platform; Knowing student responses and reactions regarding the use of video-based learning media and the Quizizz platform; and Knowing student learning outcomes from using video and Quizizz-based learning media. The method used in research is Research and Development (R and D). The subjects in this study were students of class 10 MIPA 5 MAN 1 Semarang City totaling 36 students consisting of 11 boys and 21 girls. In this research, the implementation of R and D method research has 7 stages, namely potential and problems; data collection; product design; design validation; design revisions; product trials; analysis, and reporting. The results of this study indicate that: The application of video-based learning media and the Quizizz platform is classified as adequate; Video-based learning media and the Quizizz platform are well received; After the application of video-based learning media, the average value of student learning outcomes increased as enough criteria.

ABSTRAK

Penelitian ini dilaksanakan bertujuan untuk: Menghasilkan media pembelajaran dengan menggunakan platform Quizizz yang valid; Mengetahui respon dan tanggapan siswa mengenai penggunaan media pembelajaran berbasis Video dan platform Quizizz; Mengetahui hasil belajar siswa dari penggunaan media pembelajaran berbasis Video dan Quizizz. Metode yang digunakan pada penelitian adalah Research and Development (R and D). Subjek pada penelitian ini adalah siswa kelas 10 MIPA 5 MAN 1 Kota Semarang berjumlah 36 siswa terdiri dari 11 laki laki dan 21 perempuan. Pelaksanaan pada penelitian metode R and D memiliki 7 tahapan menurut Sugiyono dalam bukunya yang berjudul "Metode Penelitian Kuantitatif, Kualitatif dan R and D"), yaitu potensi dan masalah; pengumpulan data; desain produk; validasi desain; revisi desain; uji coba produk; analisis dan pelaporan. Hasil penelitian ini menunjukkan bahwa: Penerapan media pembelajaran berbasis video dan platform Quizizz tergolong kriteria cukup; Media pembelajaran berbasis video dan platform Quzizz diterima dan ditanggapi dengan baik oleh siswa; Setelah penerapan media pembelajaran berbasis video nilai rata-rata hasil belajar siswa meningkat dan tergolong kriteria cukup.

Kata Kunci: Biologi; media pembelajaran; pembelajaran audio-visual.

INTRODUCTION

The learning process in schools is actually carried out by all education personnel using various learning media available, for example in common learning materials which include reading methods, question and answer methods, discussion methods and assignment methods. These media are the example of conventional learning media. Learning media has developed rapidly because the era influences it, teachers need to pay attention to learning media because it is related to the condition of students and affects the effective learning process. Learning using conventional media is considered less effective because it is less able to convey learning contents to students due to the lack of illustrations or the material load is too heavy, for that, more effective and more interesting media to learn is needed. Learning media must always develop following the development of science and technology to present a contemporary classroom atmosphere (Wisada et al., 2019).

Learning media is considered effective if it can support and facilitate the teaching and learning process, which includes using audio-visual media because it can represent sound and images and present an attractive appearance. Student learning methods and maximizing the role of teachers in schools as teachers are learning resources, facilitators, learning leaders, demonstrators, mentors, motivators, and evaluators. Teachers must convey information to students and ensure they truly understand their learning. Learning becomes a problem when the teacher's information transfer process cannot be optimally adopted, so learning objectives are not achieved. The problem is caused by factors that hinder learning, such as teaching materials that are too complicated, abstract delivery of material by teachers, and student disinterest. In utilizing the learning media, a teacher's creativity is needed because the learning process's success depends on the educator's competence, especially in mastering the learning material (Abdullah, 2017).

Problems in the learning process can be overcome by using audio-visual learning media. According to Talib et al. (2017), learning using video media is likely to reduce the obstacles students often face in the learning process and increase student understanding. The results of this study explain that video-based learning media in history subjects positively affects student learning outcomes (Ainina, 2014; Fujiyanto et al., 2016). One of these positive impacts is the interest and ability to easily understand learning materials that are different from the material provided by the teacher so that student learning outcomes can improve.

Research related to learning media using audiovisuals has been widely conducted. One is research conducted by Latifa and Lazulva (2020), which focuses on using animation-based learning media in learning chemistry at SMAN 09 Pekanbaru. The research focuses on animated videos using the Powtoon application, which is utilized for learning periodic elements (chemistry) for senior high school students. In addition, research related to audio-visual media as learning media was conducted by Rahmatullah et al. (2020), who developed audiovisual learning media using the Canva application. This research focuses on the utilization and feasibility test of the Canva application as a student learning media. In contrast to previous research, this study utilizes two applications as interactive learning media. Learning media development is done using the Adobe Premier and Quizizz applications to see students' understanding of learning biology material related to fungi. From this, it can be seen that the purpose of this study is to develop audiovisual-based learning media and see students' responses and learning outcomes in using the learning media that has been developed.

LITERATURE REVIEW

Learning Media

In simple terms, learning media can be interpreted as a tool in learning activities. Learning media can help facilitators deliver their material. In line with this, there is a definition which states that "Learning media is an introduction to the source of the message with the recipient of the message, stimulating thoughts, feelings, attention, and willingness so that they are encouraged and involved in learning" (Widad et al., 2021; Kumala et al., 2020; Agustina, 2017). This definition emphasizes the learning media as the message delivered between educators and students by Pakpahan in the book titled "*Media Pembelajaran*" which defines learning media as a message channel that becomes a means of communication in a learning process. Magdalena et al. (2021) also explained the meaning of learning media, namely everything that can be used in delivering information or messages in a learning process. The definition conveyed by Magdalena emphasizes "everything", where everything can be in the form of tools or objects, the environment, or even living things.

From some of these definitions, it can be seen that learning media is essentially everything useful in the learning process, from teacher to student, for students to be aware of the material presented. Therefore, the main role of learning media is to link students and educators. Learning media is one of the important aspects of the teaching and learning process, supporting and building a more interactive and interesting classroom atmosphere. Learning media is very important because it can connect teachers and students.

According to Nurfadhillah in the book titled "*Media Pembelajaran: Pengertian Media Pembelajaran, Landasan, Fungsi, Manfaat, Jenis-Jenis Media Pembelajaran, dan Cara Penggunaan Kedudukan Media Pembelajaran*" learning media will facilitate student learning because with learning media vague or abstract things can be explained concretely. Tafonao (2018) outlines the role of learning media, which consists of three roles: (1) As a necessity. The need can be interpreted that learning media cannot be ignored because learning media is a vast learning resource, which is not limited by form or type that allows students to continue learning. (2) As a tool for generating learning motivation. Learning media that is suitable for students can arouse student motivation. In addition, learning media can also facilitate the teaching and learning process and the relationship between teachers and students so that the classroom atmosphere will positively affect the learning process. (3) Redisplay the object. In this case, Tafonao (2018) explains that learning media can display objects or events from a learning material that is adjusted in the way needed.

According to Hasan et al. in the book titled "*Media Pembelajaran*" generally, the media functions as a communication tool in teaching and learning. Learning media will connect educators with students in channeling their learning materials. The main function of learning media is a learning tool, where this tool becomes a means of communication between teachers and students. According to Wahid (2018), the function of learning media can be viewed in terms of its historical or developmental history, namely (1) Audiovisual Aids (AVA), whose function is to provide concrete learning experiences to students, (2) Communication function which consists of two components, namely the messenger and the message receiver. In this case, the message can be in the form of learning materials; the messenger is the educator, and the message's recipients are the students.

When viewed from the description of the functions of learning media, learning media must fulfill these two functions, namely being a tool for providing learning experiences and channeling messages for students and educators. Wahid (2018) also explains that the use of teaching media will help the learning process and deliver messages in the form of learning materials to be more effective and efficient.

Learning Media Planning

The rapid development in this era makes people's lives more advanced, especially in the field of educational technology to the point that educators are required to improve and develop learning media with more developed mediums than before. The development of information technology produces superior mediums to convey learning material with advantages and disadvantages. Therefore, a principle is needed to determine which type of learning media follows the rules and inquiries of learning media to be used as a mass learning media more effectively and efficiently.

In producing superior quality learning media, inquiries are needed to produce the appropriate learning media. Appropriate learning media will positively impact and foster students' interest in learning. The learning media used can be in other formats than just books. Nurrita (2018) outlines the criteria that must be considered in choosing learning media, namely objectives, effectiveness, the ability of teachers and students to create and digest material, flexibility, media availability, benefits, and the quality of the media itself.

Some principles must be considered in using learning media. According to Saud in the book "*Pengembangan Profesi Guru*", the selection of learning media must pay attention to the following: (1) Function appropriately, meaning that the media used during the learning process must follow basic abilities and knowledge. (2) Helpful, meaning that when the media is used, it can improve the quality of student learning. (3) Varied, meaning that the media used is not boring and of various kinds so that students have high expectations. The results of Hadiapurwa's research in his thesis entitled "*Efektivitas Penggunaan Media Pembelajaran Berbasis Komputer Model CAI (Computer Assisted Instruction) Dalam Meningkatkan Hasil Belajar Siswa Pada Pendekatan STM (Sains Teknologi Masyarakat) Di Sekolah Dasar: Studi Kuasi Eksperimen Pada Model Pembelajaran Tematik Di Sekolah Dasar Negeri 2 Cibogo Kecamatan Lembang*" states that the use of learning media is effective in improving student learning outcomes in the cognitive aspect of understanding.

There are rules in determining the learning media an educator must understand to develop superior, effective, and interactive learning media during the teaching and learning process. The principles in learning media are that good learning media must have the right function, be useful, and be varied. Students can follow the process with quality learning media and get maximum results.

Video-based Learning Media

Interesting learning media can arouse the motivation of students. The role of teachers is needed in developing learning media that can arouse students' enthusiasm so that learning outcomes will be maximized. Following the opinion of Nurrita (2018), "Teachers must be creative in providing learning media, for example, by making their learning media." In line with what was conveyed by Suseno and Ismail (2020), they also explained that teachers ideally must be competent in managing the learning process that can arouse student motivation and have creativity and innovation in developing learning materials and / or media for students.

The rapid development of information technology has positively impacted various fields of science, including education (Cholik, 2021; Mulyati & Evendi, 2020; Setiawan, 2018; Aspi & Syahrani, 2022). By utilizing technological developments, learning media that can be used will be more diverse. One of them is audio-visual media, which is one of the alternatives in providing learning material. Referring to the opinion of Umarella et al. (2018) regarding considerations in choosing learning media, which include (1) easy to pack, (2) interesting learning, (3) and can be improved at any time. Thus, these three considerations answer the alternative utilization of audiovisual as a learning tool. Audiovisual learning

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media will be easier to pack, more interesting so that students do not feel bored, and can be corrected at any time if there is an error.

According to Salbila et al. (2020), audio-visual media is a tool or media that becomes an intermediary that includes sound and images in one unit. Saputro et al. (2021) in their research explain that audio-visual media is an intermediary media or material used, and its absorption is through seeing and hearing to build conditions that can enable students to acquire knowledge, skills, or attitudes. In line with this, Hakim and Hamzah (2022) also explained that audiovisual learning media is a tool the teacher uses to transfer the learning material that can stimulate sight and hearing. Based on this opinion, learning using audio-visual media allows teachers to channel their knowledge that can be received by sight (visual) and hearing (audio).

Based on this understanding, it can be followed that audio-visual media is a medium that can be seen (visual) and heard (audio) simultaneously. Audio-visual is a term that often describes the word "video" video media is one of the electronic media that combines audio and visual technology to create dynamic and interesting presentations. Video media can present learning materials in audio and visual forms that contain learning messages and application of knowledge of concepts, principles, procedures, and theories for students to understand the learning materials provided by the teacher. According to Ismail in the book titled "*Teknologi Pembelajaran Sebagai Media Pembelajaran*" audio-visual learning can be understood easily, where this audio-visual-based learning process utilizes hardware. Audio-visual-based learning is delivered and received using the senses of sight and hearing, so it can be an alternative to attracting students' attention.

METHODS

The research applied the Research and development (R&D) method to develop informatics learning media. The reason for this research is to find solutions to problems that occur in the learning process in the classroom by applying a learning method as an innovation and solution to the problems experienced by students and educators. Design The R and D method used in the research is Matching pre-test and post-test using the Quizizz platform.

Research with the R&D Method, according to Sugiyono in the book titled "*Metode Penelitian Kuantitatif, Kualitatif dan R&D*" is a research method used to produce certain products and test the effectiveness of these products. There are ten stages in R&D research, including (1) Potential and Problems; (2) Data Collection, (3) Product Design, (4) Design Validation, (5) Design Revision; (6) Product Trial, (7) Product Revision; (8) Usage Trial; (9) Final Product Revision; (10) Mass Production.
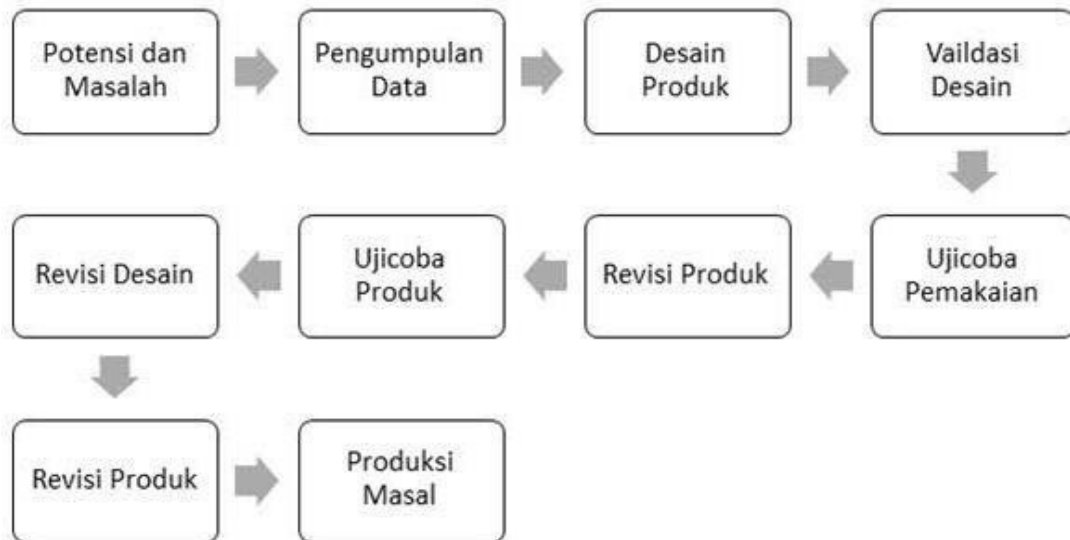
Figure 1. The stages of the *Research and Development* method
Source: Sugiyono in the book titled "Metode Penelitian Kuantitatif, Kualitatif dan R&D"

Of all these stages based on **Figure 1** about stage of research and development method, not all were carried out in this study. The implementation of R and D research only reaches the 7th stage of the research because the results are only tested and produced on a limited basis. In **Figure 2** below, these are the stages of research that will be carried out in this study:
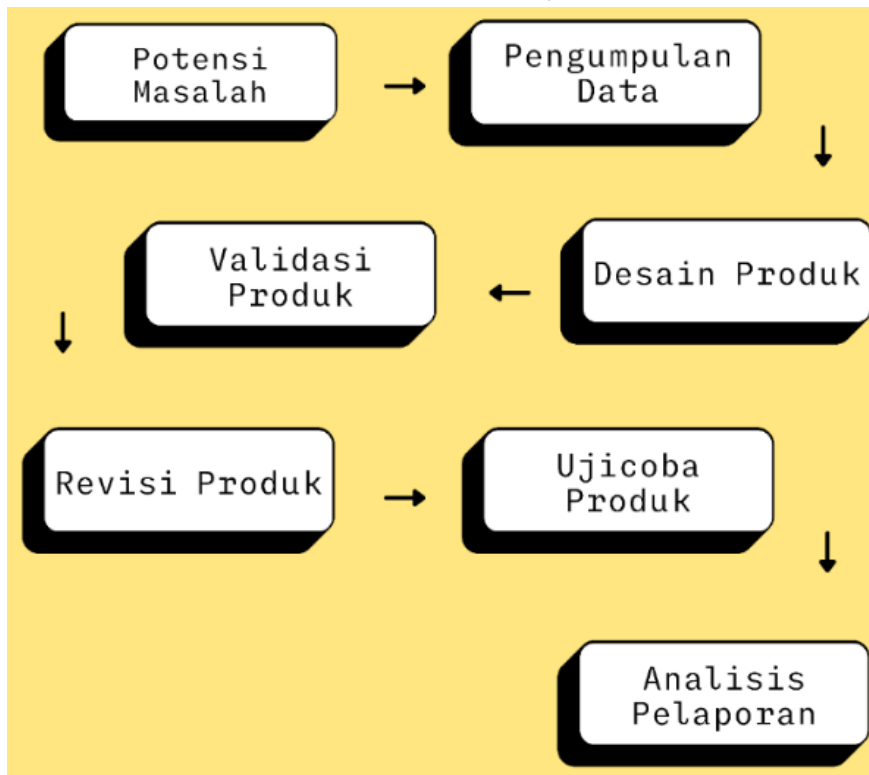

Figure 2. Stages of the Research and Development method that will be carried out
Source: Sugiyono in the book titled "Metode Penelitian Kuantitatif, Kualitatif dan R&D"

Matching pre-test post-test method is a method which giving an initial test before the application of the experiment. Then, provide certain treatments so the students are expected to get better results in post-test activities after these activities. Matching pre-test and post-test is a research activity by giving an initial

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test before experimenting, and after that is followed by giving a final test. The pre-test and post-test test design is carried out to determine students' learning ability and whether there is an impact of the learning media provided on student learning outcomes.

This research involved Biology teacher of Class 10 IPA 5 MAN 1 Semarang City as the research mentor, related subject teacher, and an observation observer. The subjects in this study were the students of class 10 IPA 5 MAN 1 Semarang City, with a total of 36 students consisting of 11 male students and 21 female students. The object of research used is the application of video-based learning models and pre-test post-test, which aims to improve student learning outcomes, especially Biology subjects in class 10 IPA 5 MAN 1 Semarang City.

RESULTS AND DISCUSSION

The first stage is to conduct school and classroom observations to find out and design the process of making video displays that can attract X MIPA 5 students at MAN 1 Semarang to focus more on what the teacher says. Not only observations, researchers conducted interviews with biology teachers regarding the subjects being taught to students, namely mushroom material and problems that often occur during learning, such as when teaching the material some students cannot answer if asked a question related to the material that has been taught. In an interview with one of the X MIPA 5 students, the student explained that he often quickly forgot about the material that had been delivered because there was no further description and only stuck to the book that had been provided.

For students to understand the material and be interactive in class, the learning media that can be used is video because video can solve the problems that occur during the learning process in the classroom. Audio-visual media will display the reality of the material, which can provide different experiences for students to learn, thus encouraging students to carry out self-activity (Ariyana et al., 2020; Mahnun, 2012). Fitriani (2019) also stated that audio-visual media will provide stimulus to students because the nature of the media is sound (audio) and images (visual). These statements become supporting data for the positive impact of learning media-based learning media.

As explained earlier, a pre-test was conducted for students in this study. The initial stage of understanding testing (pre-test) was completed using the Quizizz platform. Using the Quizizz application can provide positive results for students, such as building motivation and encouraging learning (Wibawa et al., 2019; Handayani & Wulandari, 2021; Hidayati & Aslam, 2021). In this pre-test and post-test, thirty-two students worked on the Quizizz Application, where two of the thirty-four students did not bring their cellphones and were absent from school.

Munir, in the book titled "Multimedia" when creating a video, the first action is to strategize the plan for the content of the material in the video, editing from other videos or recording the display images and then save or move in the form of files so that they can be edited and create a moving and creative display. Therefore, researchers researched video editing applications suitable and mastered by researchers, such as Adobe Premier. It is hoped that in making videos, teachers can keep up with developing technology so that making videos can be mastered in delivering material to students.

Figure 3. Mushroom Material Learning Video
Source: Personal documents

Figure 3 is an example of a learning video display on fungal material. The video contains a general understanding of fungi, a flowchart of the fungi learning process, general characteristics of fungi, several ways for fungi to live, parts of fungi, functions of parts of fungi, Quizizz codes and so on.

Figure 4. Question View in Quizizz
Source: Personal Documentation

In **Figure 4**, there are several questions that will be used for pre-test and post-test to X MIPA 5 MAN 1 Semarang students. The questions made to be tested in Quizizz are related to the mushroom material as the focus of this study and have ten questions in total. The use of Quizizz will test students' understanding after viewing the learning video, as well as train students to think quickly and critically.

Quizizz itself is a quiz application that can be used to test student understanding. Quizizz does not only present monotonous questions but also provides animation, music, and so on so that it becomes a more interactive "quiz" media than just utilizing Student Worksheets. The choice of using Quizizz for test media is because Quizizz is now a learning media that teachers often use because of its interactive nature. According to Salsabila et al. (2020), Quizizz can be a fun and interactive learning strategy without losing the essence of ongoing learning. Of course, this is an important aspect for students, as students often prefer fun classroom conditions. Meanwhile, the use of Quizizz for educators, according to Wijayanti et al. (2021), can make it easier for educators to evaluate learning, with the existing features, teachers can see the results of the evaluation directly, making it easier to make decisions for the next evaluation.

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Design validation is carried out by experts in Informatics Learning Media, where there are evaluations and improvements to be made, the addition of a mushroom flowchart and glossary in the video.
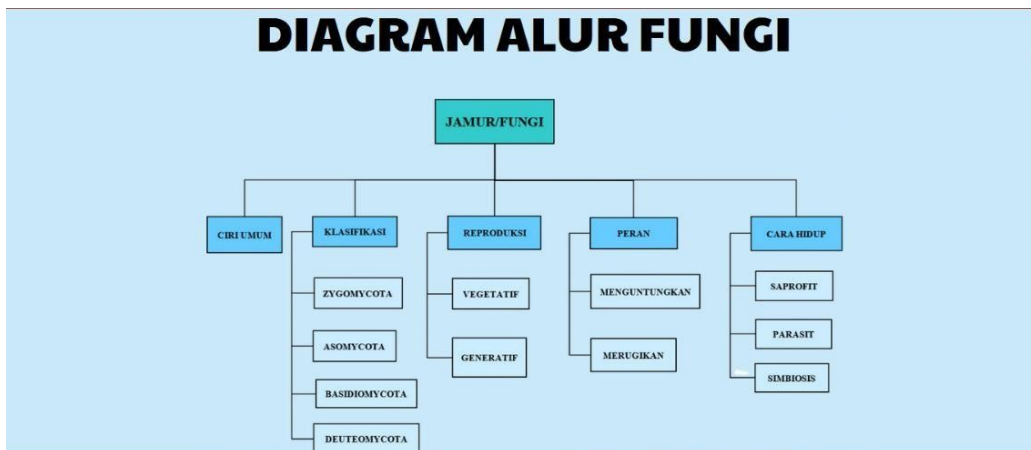

Figure 5. Mushroom Flowchart Display
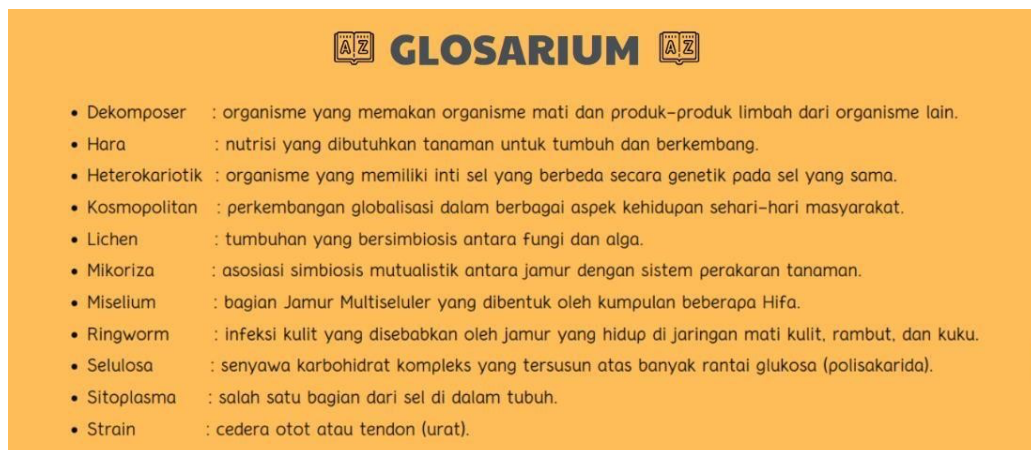*Source: Researcher Documents*

Figure 6. Glossary View
Source: Researcher Documents

Figure 5 is a display of the mushroom flow chart, there are five sub-chapters that are studied during the research or learning process regarding mushroom material. Meanwhile, **Figure 6** is a glossary developed after the media experts' evaluation. The glossary focuses on eleven foreign or main terms in the material developed through the video, so the glossary was developed as a supporting tool for the video-based learning process.

Observation activities at MAN 1 Semarang were carried out by organizing a pre-test first to test the understanding of X MIPA 5 students about mushroom material. Comprehension testing applies a Minimum Completeness Criteria or *Kriteria Ketuntasan Minimal* (KKM) of 75 with the criteria "sufficient". This criterion was taken based on research conducted by Priyanti (2021). In this pre-test, students answered several questions that had been provided regarding mushroom material in the first semester by completing the parts of the fungus and their functions in the form of ten questions.

Tabel 1. Learning Process Success Criteria

No	Success Rate	Predicate of Success
1	86 - 100%	Very good
2	76 - 85%	Good
3	67 - 75%	Simply
4	51 - 66%	Low
5	<50%	Very Low

Sumber: Priyanti, 2021

$$\% = \frac{n}{N} x100$$

Description: n = Value obtained N = Overall score

The pre-test results will be calculated using the average formula, as shown in **Figure 7**. The calculation results of the class average obtained a value of 37.5 with the criteria "very low". After the pre-test and knowing the extent of understanding of X MIPA 5 students, video-based learning was carried out on the mushroom material itself. This learning process went well, the majority of students were focused on the video being played, making the classroom atmosphere more interactive and the learning process more comfortable.

After the learning process is complete, the post-test stage is carried out on X MIPA 5 students to test students' understanding again. The post-test was carried out using the help of the Quizizz platform to make the test activities more interactive and interesting. The post-test scores that have been collected are then averaged again, where the average student score results in a score of 67.43 with "sufficient" criteria, where the value has increased from the previous value, namely when the pre-test was conducted.

Based on the comparison of pre-test and post-test scores, it is to be acknowledged that video-based learning can improve student scores significantly. Based on the results obtained by X MIPA 5 students, two students were in the excellent criteria, and thirteen students were in good criteria. After explaining the material, twenty-seven students experienced an increase from the pre-test, two students experienced a decrease in grades, and the task of students whose scores did not increase or decrease in the pre-test and post-test. Video learning media is good for teachers when teaching material to students because student learning outcomes have increased.

With video-based learning at MAN 1 Semarang, teachers will know the level of student success in mushroom material before and after the learning process. In addition, teachers can know and analyze the strengths and weaknesses of students, which can be a benchmark in designing the next learning video. Developing video-based learning media requires creativity from a teacher in editing videos and mastering technology as it develops. The students of X MIPA 5 provided support and liked the existence of video learning media on mushroom material so that the material is deeper, better, and clearer in appearance.

CONCLUSION

Learning media is a method or tool used in the teaching and learning process. The aim is to clarify the presentation of material on a subject or the information delivery to accelerate and improve the learning process and results. Learning media can increase student attention, motivating students to learn and increasing direct interaction between students and teachers. The role of learning media is to facilitate, explain, and support teachers in the teaching and learning process so the students can easily understand the content of learning materials and foster students' enthusiasm for learning. Visual media is the most appropriate and accurate learning media to convey messages and foster student understanding. With the help of video media, students can better understand the material taught by the teacher by showing a video of the material presented.

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Learning videos are the right media to deliver a variety of learning materials to students. There are many benefits and positive impacts for students and teachers. Learning videos can be made interesting by presenting material visually to help students understand the material presented. According to research in the literature, the use of learning videos shows that the effectiveness of learning video media is more dominant in the sensory stimulation of students. Based on the results of observations made at MAN 1 Semarang City, it was found that the learning outcomes obtained by X MIPA 5 students were included in the "Very Low" criteria. After the material is given, video-based learning media learning activities are proven effective in increasing student motivation in biology subjects. This is evidenced by the results of the post-test or questions after video-based activities get results with "sufficient" criteria. So, in the post-test, there was an increase in student learning outcomes, which were previously "very low" criteria to "sufficient".

AUTHOR'S NOTE

The author hopes this article can be useful for readers and emphasizes that this writing does not contain plagiarism and that there are no problems regarding the publication of articles.

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