

Biology Teaching and Learning

p-ISSN 2621 – 5527

e-ISSN 2621 – 5535

Abstract. *Learning videos on mushrooms for class X students were developed with the aim of producing learning media that are valid and practical. The learning videos on mushroom material that are developed have a short duration, are supported by animation, images, text, and sound so that the mushroom material is more easily understood by users. This research is a type of research and development (R&D) using the ADDIE development model or a model with stages of analysis, design, development, implementation and evaluation. The subjects of this study were expert lecturers as subjects who assessed research instruments and tested the validity of learning videos on mushrooms. Biology teachers and X MIA 5 students at MAN 1 Makassar City as subjects who tested the practicality of mushroom learning videos. The results showed that the learning videos on mushrooms for class X students were valid and practical. The results of the validity value obtained were 4.5 (valid), and the practicality value obtained from the teacher's response was 90% (very practical). So, it can be concluded that the learning videos on mushroom material for class X students developed can be used and tend to improve student learning outcomes.*

Keywords: *learning video, fungi, valid, and practical*

Muhammad Al Gazali

*Universitas Negeri Makassar
Indonesia*

Adnan

*Universitas Negeri Makassar
Indonesia*

Andi Mu'nisa

*Universitas Negeri Makassar
Indonesia*

Development of Learning Video on Mushroom Material for Students of Grade X MIA 5 MAN 1 Makassar City

Muhammad Al Gazali

Adnan

Andi Mu'nisa

Introduction

Mushrooms are one of the five kingdoms of living things that are used as an essential material in high school biology learning in grade X. Mushrooms as essential material are listed in the 2013 curriculum in the basic competencies (KD) of 3.6, which reads to group types of fungi based on their characteristics and roles in life through experiments. Based on these basic competencies, mushroom learning should be carried out both theoretically and in practicum. Learning that only focuses on verbal information tends to make students lazy and bored, so the learning process becomes less than optimal, so technology is needed that can be used as a learning medium to maximize learning. Based on the development of technology, learning media can be grouped into four groups: (1) technological media, (2) audio-visual technology media, (3) computer-based technology media, and (4) combined print and computer technology media. Computer-based technology is a way to produce or deliver material using computers. Some characteristics of media developed from computer-based technology are as follows: (1) can be used randomly, non-sequentially, or linearly; (2) can be used based on the wishes of students; (3) learning can be oriented to students and learning with high activity by students (Zainiyaiti, 2017). According to Zaenal (2012) and Purwanti (2015), Learning media using videos has a higher tendency to facilitate the memory and understanding of lessons because it uses more than one type of sense, namely the senses of sight and hearing. According to the results of research by Mell Silberman, visual learning can increase memory levels from 14% to 38%. This study also showed an increase of up to 200% in vocabulary mastery when the material was taught using visual media. Even the time required for concept delivery is reduced by 40% to add to the verbal presentation. Learning videos about mushrooms are an alternative solution in learning media that can help create optimal learning situations about mushrooms. Mushroom

learning videos can be used to provide visualization to students about the material delivered verbally by the teacher, making it easier for students to understand the material delivered.

Learning video has several advantages, namely: (1) being able to record images or events realistically and briefly; (2) being able to explain abstract things realistically; (3) overcoming distance and time barriers; and (4) being able to be repeated if additional explanation is needed. However, in addition to having these advantages, learning videos also have several disadvantages. According to Kustandi and Sutjipto (2013), a video is a tool that can present information or explain processes, explain complex concepts, teach skills, shorten or slow down time, and influence attitudes. Meanwhile, according to Sadiman (2009) and Kurniawan (2016), video is an audio-visual medium that displays images and sounds. The message presented can be factual (events, important events, news) or fictitious (such as stories) and can be informative, educative, or instructional.

Based on this, it can be practically concluded that the learning videos that have been observed have several advantages, including (1) good editing, image, and sound quality, so it is interesting to observe; (2) good delivery of material so that it is easy to understand; and (3) the use of time that is not too long to deliver material, so it is not boring to observe. Videos can be utilized in the learning process because they can provide unexpected experiences for learners. In addition, videos can also be combined and made in such a way that they provide animation and set the speed to demonstrate changes over time (Daryanto, 2013).

The experience of researchers when taught mushroom material in high school shows several shortcomings, including (1) the distribution of material that is still one-way, namely through lectures; (2) the use of media that is still limited to power points and has not been maximized; (3) the limitations of mushroom images provided, which are still dominated by text; and (4) the involvement of students who have not been active in observing mushroom specimens.

The results of an interview with a biology teacher at MAN 1 Makassar City on Wednesday, October 17, 2018, revealed some information about mushroom learning, including (1) that the delivery of mushroom material is limited to verbal explanations and (2) that the use of learning media is not sufficient to observe mushrooms properly because it still relies on 2D media such as books and pictures. This limitation hinders the visual representation required, as two-dimensional media often find it difficult to represent complex or abstract objects or concepts. Some concepts that are difficult to understand visually may be difficult to explain through two-dimensional drawings or illustrations. This can make it difficult for learners to understand complex material or visualize difficult concepts. Observation of fungi needs to display a complete morphological structure so that all parts can be observed in detail. In addition, a complex explanation is needed but presented simply about the concept of the life cycle of fungi; (3) biological laboratory conditions are inadequate because they are not equipped with the tools and materials needed to observe fungi properly. This includes the shortcomings of microscopes with various lenses and adjustments that allow detailed observation of the structure of fungi. In addition, tools and materials such as Petri dish, slides, dye solutions, culture media, and sterilizers are not yet available.

Based on preliminary data obtained from MAN 1 Makassar City, there is a gap in mushroom learning. In addition to providing theoretical knowledge to students, the mushroom learning process is also expected to identify fungi. Therefore, a learning medium is needed that can overcome these shortcomings, such as mushroom learning videos.

Based on this background, the researcher intends to conduct research on "Development of Learning Videos on Material for Class X MIA 5 MAN 1 Makassar City Students" with the aim of improving the learning outcomes of grade X students in MAN 1 Makassar City.

Research Method

The type of research used is research and development (R&D) in the development of interactive multimedia for class X MIA 5 at MAN 1 Makassar City on excretory system material. This

interactive multimedia development model adopts the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation. This research was conducted from August to September 2019 at MAN 1, Makassar City. The analysis stage was carried out at MAN 1, Makassar City. The product developed by the researcher is then assessed by two expert validators to test its validity. The implementation stage is carried out to test the practicality of the developed product by involving the assessment of practitioners, namely teachers and students.

Result and Discussion

The development research carried out resulted in products in the form of teaching videos on mushroom material. The results of the product validity and practicality test analysis are as follows:

a. Validity Test

Validation of learning videos about mushroom material is carried out several times until a valid and suitable video is obtained for use. The following are the results of expert validators' assessments of the interactive multimedia.

Table 1. Results of the Learning Video Validity Test on Mushroom Material Based on the Validator Assessment

No.	Aspects that Rated	Average Score	Information
1	Content Eligibility	4.7	Valid
2	Eligibility of Presentation	4.6	Valid
3	Media Eligibility	4.43	Valid
4	Language feasibility	4.5	Valid
Average (Va)		4,5	Valid

The table above shows the average scores for the interactive multimedia validity test. The average scores for each aspect are as follows: content feasibility 4.7; feasibility of presentation 4.6; media feasibility 4.43; and language aspects 4.5. From these three aspects, the average value of the total validity of the learning videos on the material was 4.5. The value is included in the valid category ($3.5 \leq Va \leq 4.5$). After considering all aspects, it can be concluded that the learning video on the mushroom material that has been developed is feasible to use with revisions according to the suggestions given by the two validators. Based on Table 1.1, from the assessment of these four aspects, it can be concluded that the learning video on the developed mushroom material has a valid level of validity, following the validity criteria, which are in the range of $3.5 \leq Va \leq 4.5$.

b. Practically Test

The practicality test was carried out using questionnaires with responses from teachers and students after they watched learning videos about mushroom material. Response questionnaires were given to 3 biology teachers and 21 students. The following is the data obtained:

Table 2. Practicality Test Results Based on Student Questionnaire Analysis

Indicator	Teacher Response			Response Score Average	Response Score Presentation	Criteria
	1	2	3			
Attractiveness	4.7	4.2	4.5	4.4	88%	Very Practical
Easy to Use	5	4.6	4.9	4.8	96 %	Very Practical
Learning Video Media Content	4.5	4.2	4.3	4.3	86 %	Very Practical
Learning Presentation	4.5	4.7	4.7	4.6	92 %	Very Practical
Learning based on <i>ICT (Information and Communication Technology)</i>	5	4	4	4.3	86 %	Very Practical
	4.7	4.3	4.5	4.5	90 %	Very Practical

Table 3. Practicality Test Results Based on Student Questionnaire Analysis

Indicator	Total Rating Score	Response Score Average	Response Score Presentation	Criteria
Ease in Understanding Learning Video Content	571	4.8	95%	Very Practical
The attractiveness of the display of learning videos	434	4.3	87 %	Very Practical
Learning Presentation	456	4.6	87 %	Very Practical
Learning based <i>ICT (Information and Communication Technology)</i>	181	4.5	90.5 %	Very Practical
		4.6	90 %	Very Practical

Based on Table 2, the percentage of practicality of learning videos on mushroom material includes 27 statements overall. The response results showed a practicality value of 90%, which indicates a very agreeable response. When viewed from the perspective of the categorization of product practicality, the percentage is in the range of 80%–100%, which shows that the category is very practical. Furthermore, based on Table 3, the percentage of practicality of learning videos on mushroom material shows a practicality value of 90%, which also indicates a very positive response. When viewed from the categorization of product practicality, the percentage is in the range of 80%–100%, which indicates that the category is very practical.

The development of learning videos on mushroom material is carried out based on the results of the analysis of teacher and student needs, student characteristics, KD (Basic Competencies), and learning objectives. The mushroom learning video developed includes several components, including real mushroom specimen videos, animated videos, images, text, and audio. All these components are presented in an interesting way and based on the analysis carried out, so that the video can be used effectively. The use of learning videos as a learning medium is able to provide clarity of message because students see learning objects concretely. Learning videos should provide a visualization that can explain material or concepts concretely, so as to shorten the distance between theory and reality. In addition, the use of learning videos can increase the motivation and retention (memory and absorption) of learners (Turyati 2016).

The development process is as follows:

1. *Analysis*: Perform an in-depth analysis of problems related to suboptimal mushroom learning. It was found that mushroom learning was not in accordance with the basic competencies established because it was carried out in the dry season, making it impossible

to observe living mushroom specimens. This results in learners not having real experience observing fungi, which is a challenge to understanding the material.

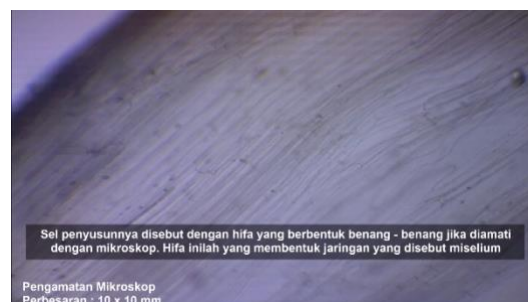
2. *Design*: Design a mushroom learning video that can feature live mushroom specimens, text, images, animations, and sounds to explain the material in monologues. This design can be arranged in the form of a storyboard that displays the structure of the video and the explanation of the material in it.
3. *Development*: Start developing mushroom learning videos based on pre-made designs. Based on the mushroom material, create a script or scripts that explain the material in a monologue. Next, take a video that can clearly visualize the design and script that have been made. Then a voice recording is done to include an explanation of the monologue. After that, do the editing process using video editing applications to combine video, sound, text, and images and to create animations or graphics that support explaining the concept of mushrooms better in learning videos. Furthermore, validity tests were carried out with two expert validators in the fields of biology education and educational technology. Validation was carried out to determine the validity of material, media, and grammar so that valid mushroom learning videos could be obtained.
4. *Implementation*: After the learning video has been developed, conduct a practical test to assess the practicality of its use as a learning medium. Practical tests can be carried out using questionnaires given to students to assess the level of attractiveness and clarity of learning videos, as well as to teachers to evaluate the practicality of using these videos in the learning process until practical learning videos are obtained.
5. *Evaluation*: Based on the results of the validity test and practical test, identify the shortcomings that need to be corrected and the advantages that need to be improved in the video. A comprehensive evaluation can help improve mushroom learning videos so that they can be more effective in supporting optimal mushroom learning.

Learning videos on mushroom material are very suitable for use by teachers in teaching and students in learning. The video can be accessed in mp4 format via laptops, PCs (Personal Computers), and smartphones, which are commonly owned by many people in today's modern era. Mushroom learning videos have several advantages, such as the following:

- a. Video of real mushroom specimens

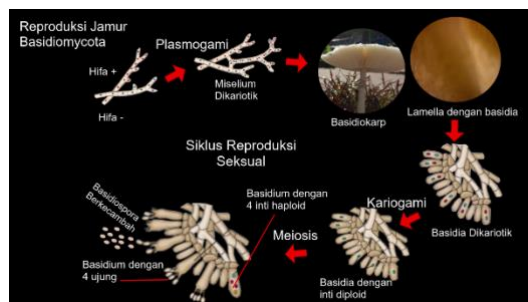


Picture 1. Mushroom *Macrolepiota procera*



Picture 2. *Macrolepiota procera* Fungus Incision

b. Animation Video



Picture 3. Mushroom Development Cycle Animation

c. Narrator voice, supported by images, text, and background sounds.

All these advantages make it easier for users to observe mushrooms because videos that display real situations. In this case, videos of living mushroom specimens can provide real experience in observing mushrooms so that they can be an alternative or substitute for mushroom observation activities in the laboratory. Besides that, the text, images, sound animations, and monologue explanations presented can provide a stimulus for learning the herbal material presented through the video because Learning videos can be packaged in multimedia, or the simultaneous presentation of information in the form of text, images, and sound (integrated), so that it becomes effective and efficient. Multimedia can stimulate the human senses and can also flexibly adjust one's learning speed; besides that, multimedia can make it easier for students to absorb the message to be conveyed until the meaning is clear (Sari and Siagian, 2013).

The advantages of learning videos on mushroom material can certainly improve the lack of tools and materials available in schools and the limitations of learning media used by the school, such as textbooks and other 2-dimensional media.

Biology learning on mushroom material in the 2013 curriculum is taught in odd semesters (the July-December period), which is the dry season where it is difficult to observe fungi well. Therefore, the use of learning videos on mushroom material becomes more relevant to assist teachers in teaching mushroom material.

The use of learning media must be adjusted to the learning needs of students and their learning conditions. The criteria for selecting learning media include suitability with learning objectives, learning materials, available facilities, student learning characteristics, learning styles, and theories in learning and learning. Because the learning process is student-centered, the teacher acts as a facilitator who helps students build knowledge by providing learning media that are in accordance with their characteristics (Boniface, 2014).

Assessment of the practicality of learning videos on mushroom material was carried out through limited trials with teachers and some learners, based on their responses. At this stage, researchers show and teach the use of products to biology subject teachers to be used in teaching mushroom material to students. During the trial, the learning conditions looked quite ideal because the teacher was enthusiastic about teaching using learning videos and the students were very interested in observing the videos. Teaching facilities, such as laptops, LCD projectors, and loudspeakers, facilitated 21 learners. Learning videos on mushroom material are interesting to observe because the material content presented is simple and concise, with videos of real mushroom specimens, hyphal incisions observed through a microscope, and animations about fungi supported by images, text, and sound, making it easier for students to learn mushroom material.

This is in line with research conducted by Dewi (2013), where the practicality of learning tools can be assessed based on their implementation, teacher response to the implementation, and student response.

In addition, the learning video can also be used by the students themselves to repeat the material that has been given by the teacher in class. Because of its advantages, this learning video can be used anytime and anywhere by students, provided that there is a supporting device to display the video. In addition, learning videos can also be used repeatedly, and learning videos can be used for a long period of time in the learning process as long as the content of the learning video is still relevant to the existing material (Fechera et al., 2012).

Conclusion

Based on the results of research on the development of learning videos on mushroom material for grade X high school and Ma students, it can be concluded that the learning video on mushroom material, including Kate Gori, is valid because the video presented is very interesting in terms of (1) the display of the presentation that displays the original specimen video and animation about mushrooms that are rarely observed by teachers and students, (2) mushroom material adapted to Curriculum 2013 and basic competencies (KD) 3.6 class X high school biology, and (3) presented simply and concisely. Learning videos on mushroom material are also in the practical category because they are very easy and efficient to use, and teachers and students are very enthusiastic about using them.

Reference

- Bonifasisus Subandriyo, 2014. Upaya Peningkatan Prestasi Belajar Materi Trigonometri dengan Pendekatan Konstruktivis pada Siswa Kelas X-3 SMA Negeri Weru Tahun Pelajaran 2013 – 2014. *Jurnal Pendidikan V*, 10 – 11
- Daryanto. (2013). *Media Pembelajaran Peranannya Sangat Penting Dalam Mencapai Tujuan Pembelajaran*. Yogyakarta: Gava Media.
- Dewi, Mariana. 2013. “Pengembangan Perangkat Pembelajaran Biologi Berorientasi Pengembangan Intelektual Peserta didik pada Materi Sel Kelas XI SMA.” Skripsi S1. Semarang: Fakultas Matematika dan Pengetahuan Alam Universitas Negeri Semarang.
- Dian SM, dan Siagian S, 2013. Pengembangan Media Video Pembelajaran Pangkas Rambut Lanjutan Berbasis Komputer Program Studi Tata Rias Rambut. *Jurnal Teknologi Pendidikan*, 6 (7)
- Fechera Boy, Somantri M, dan Hakim DL, 2012. Desain dan Implementasi Media Video Prinsip-prinsip Alat Ukur Listrik dan Elektronika. *Jurnal Nvotec*, 8 (2), 116
- Kurniawan TD, 2016. Pengaruh Penggunaan Media Video Pembelajaran Terhadap Prestasi Belajar Ilmu Pengetahuan Sosial Siswa Kelas V Sd Se-Kecamatan Gedangsari Gunungkidul Tahun Ajaran 2015/2016 *Jurnal Pendidikan Ke-SD-an*, 3 (1), 21-26
- Kustanji Cecep dan Sutjipto B, 2013. *Media Pembelajaran Manual dan Digital Edisi Kedua*. Bogor: Ghalia Indonesia.
- Susilana R, dan Riyana C. 2009. *Media Pembelajaran Hakikat, Pengembangan, Pemanfaatan dan Penilaian*. Bandung: CV Wacana Prima.
- Turyati, M. 2016. Pengaruh Penggunaan Media Video Edukasi Terhadap Hasil Belajar PKN Siswa Kelas VII SMP Negeri 2 Gondang Rejo. *Jurnal Pkn progresif*, 11 (1), 260

Zainiyati HS, 2017. *Pengembangan Media Pembelajaran Berbasis ICT Konsep dan Aplikasi pada Pembelajaran Pendidikan Agama Islam*. Jakarta: Kencana

Muhammad Al Gazali	Mathematics and Science Faculty, Universitas Negeri Makassar Email : Muhammadalgazali029@gmail.com
Adnan	Mathematics and Science Faculty, Universitas Negeri Makassar Email: adnan_unm@yahoo.co.id
Andi Mu'nisa	Mathematics and Science Faculty, Universitas Negeri Makassar Email : Mu_nisa@yahoo.com