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Development Of Learning Videos On Respiratory System Material For Class XI SMA/MA

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Abstract: In learning, teachers have used media in the form of videos, and videos that come from the internet and are not by the material presented because the content of the material in the video is not by the learning objectives at school. As a result, the media used by teachers when teaching in class is in the form of lecture methods using PowerPoint media, torso, image media downloaded on the internet, and the media of independent curriculum printed books, the number of printed books has not met the number of students, so that the books held by students are only curriculum 13 books. In addition, the results of interviews that were conducted with phase F students at SMA N 2 Solok were obtained with a percentage result of 82%. Students agree that the learning videos are used in the biology learning process, especially in respiratory system material. The purpose of this study is to determine the development of learning media in the form of learning videos on the respiratory system material of class XI SMA/MA that is valid and practical.

***Keywords*: Learning Video, Learning Motivation, Learning Media.**

1. Introduction

Currently, technology is widely used in learning both in college and school, including the use of the Internet. The Internet is a communication medium that is used in various ways, including to increase students' knowledge and learning experience. On the other hand, the internet is also supported by a device, namely a computer and a smartphone.

Many educational factors use communication technology such as this device, this proves that communication using devices and added software assistance has brought influence in all sectors including education. Educational activities utilizing educational technology, and educational media today cannot be separated from learning. Because education is a primary human need for increasing resources and knowledge. One of the technological developments in question is learning media in the form of audio-visual motion with an example of video. Which can later be used as a tool to deliver material or references in schools and colleges.

The use of technology in learning is indispensable in terms of designing, analyzing, evaluating, developing, and implementing materials in the learning process. The important thing in the learning design process is the media used in learning. The existence of learning media is not only a complement to teaching activities, but functions to facilitate the transmission of knowledge. Learning media will make it easier to convey knowledge. Learning media will facilitate the interaction between teachers and students and help students learn more optimally.

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Learning media is not only able to increase learning motivation but also significantly increase student learning outcomes with the use of learning media. This means that the existence of learning media is not only a complement to teaching and learning activities but functions to facilitate the delivery of knowledge. Learning media will facilitate the interaction between teachers and students and help the learning process more optimally. By providing learning that is close to children's habits, namely playing on smartphones which is associated with learning. This form of learning will make students motivated in the learning process that takes place in an era with the needs of today's learners who are millennial students.

Learning videos greatly shape the effectiveness of learning both online and face-to-face because students can observe in real terms the material in the video that has not been understood by students [25]. So far, the learning video media used by teachers in teaching directly is mostly obtained from the internet where the presentation of the material is still dominated by teachers and glued to textbooks. In addition, teachers also have difficulty in making learning videos that are suitable for learning.

Based on the results of interviews that have been conducted with 3 biology teachers who teach in phase F of SMA N 2 Solok, teachers have used media in the form of videos, the media used by teachers is videos taken from the Internet because teachers do not have their own designed learning videos, where teachers have difficulty preparing technology-based learning media. The video taken on the internet is also not in accordance with the material presented because the content of the material in the video is not in accordance with the learning objectives.

As a result, the media used by teachers when teaching in the classroom is in the form of lecture methods using PowerPoint media, torso, image media downloaded on the internet, and the media of independent curriculum printed books, but the number of independent curriculum printed books available has not met the number of students so that the student holding book is only curriculum book 13. This causes students to find it difficult to follow the ongoing learning it will have an impact on low motivation and student learning outcomes, especially in the material of the human respiratory system. In addition, the results of interviews that were conducted with phase F students at SMA N 2 Solok were obtained with a percentage result of 82%. Students agree that learning videos are used in the biology learning process, especially in respiratory system material.

The material of the respiratory system in humans contains a description of the respiratory organs and respiratory mechanisms that occur in the human body. The human breathing mechanism is difficult to observe directly, so it needs a medium to help visualize the organ and the breathing mechanism can be studied through two-dimensional or three-dimensional models.

The respiratory system is one of the materials that is considered difficult for students to understand because students cannot directly see the organs that make up the respiratory system and the processes that occur in the respiratory system in the body [26]. Therefore, there is a great need for video-based learning media to teach this respiratory system material so that students can better understand the material being studied.

Based on the description above, researchers have conducted research aimed at finding out whether the development of practical learning videos for the understanding of biology learning of SMA N 2 Solok students with the title "Development of Learning Videos on Respiratory System Materials for Class XI SMA/MA".

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II RESEARCH METHODS

Type of research

The research on the development of learning videos on respiratory system material at the high school/MA level was carried out at SMA N 2 Solok and was carried out in the 2024/2025 school year. This research uses a research and development method known as *Research and Development* (*R&D)*. The product developed is in the form of learning videos intended for students on respiratory system material. The research used in this learning video development research is a 4-D development model (*four D model*). In the implementation of this research, it is only limited to 3 stages, namely Define, Design, and Develop. Researchers do not do it to the stage *of dissemination.*

Research procedure

Steps of the 4D model in the research and development of learning media in the form of learning videos:

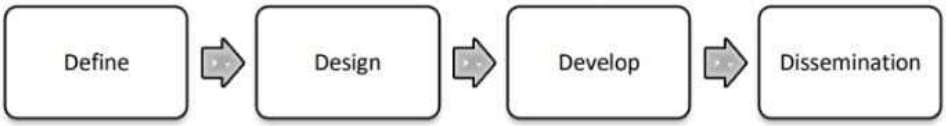

Figure 1. The 4D model

Instrument and data analysis

A data collection instrument used to measure the validity and practicality of learning videos. Questionnaire on the validity of learning media using learning videos by lecturers and teachers. The validity questionnaire includes 3 criteria, namely: the display component includes the design *Layout* or layout, text, images, audio, video, usage, and packaging. The components of the learning material include conformity with the curriculum, users, opening, core, and closing. The language component includes languages that correspond to the EBI.

The learning video practicality questionnaire by teachers and students includes 3 assessments, namely: Media design components include according to the characteristics of students, the operation of learning videos, color combinations between backgeounds, writing, images, animations, font types, and font sizes. The benefit component includes the ease of users in delivering material, attracting students' interest, and reducing students' dependence on teachers. Language components include the variety of language or words used, the effectiveness of sentences used, and the spelling used.

The analysis of the validity of this learning media is in the form of the feasibility of content, presentation, language, and graphics. Based on the validity questionnaire, it is tried with the following steps: Providing an answer score with criteria based on the Likert scale modified from [28] as follows.

SS : Strongly Agree with Weight 5

S : Agree with Weight 4

KS : Disagree with Weight 3

TS : Disagree with Weight 2

STS : strongly disagree 1

a. Determine the highest score from the formula: Calculated score = number of validators x number of indicators x maximum score.
b. Determine the number of scores from each validator by adding up all the scores obtained from each indicator. All scores were from each indicator.
c. Determine the highest score obtained by adding the scores of each validator.

$$\text{Validity score} = \frac{Total\ score\ obtained}{Number\ of\ highest\ scores} \text{ X } 100\%$$

Provides a validity value with modified criteria from [28]

81% - 100% = Valid

61% - 80% = Valid

41% - 60% = Quite Valid

21% - 40% = Less Valid

0% - 20% = Invalid

The data of the learning media practicality test was analyzed with the following criteria: Giving an answer score with criteria based on the Likert scale modified from [28] as follows.

SS : Strongly Agree with Weight 5

S : Agree with Weight 4

KS : Disagree with Weight 3

TS : Disagree with Weight 2

STS : strongly disagree 1

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a. Determine the highest score, from the formula. Highest score = number of practicalities x number of indicators x maximum score

b. Determine the number of scores from each respondent by adding up all the scores obtained from each question item.

c. Determine the score obtained by summing the scores of each respondent. The data of the learning media practicality test was analyzed with the formula:

$$\text{Practicality score} = \frac{\text{Average number}}{\text{Maximum number}} \text{X } 100\%$$

With the modified criteria of [28] as follows:

81% - 100% = Very Practical
61% - 80% = Practical
41% - 60% = Quite Practical
21% - 40% = Less Practical
0% - 20% = Impractical

III. RESULTS AND DISCUTION

Before the trial is carried out, the product is first validated by expert validators (material, media, users). The goal is to find out the validity of learning media in the form of learning videos and also to be able to produce better products. In the selection of expert validators, it is recommended on the competence of each validator, so that they can assess the products produced.

Table 1. Results of Learning Media Analysis Learning Videos

No	Aspects	Validator					Shoes	Maxs Score	%	Ket
		V1	V2	V3	V4	V5				
1.	Learning Media	93	78	78	68	92	409	475	86%	Highly Valid
2.	Learning Materials	97	85	92	72	99	445	500	89%	Highly Valid
3.	Language	9	10	9	8	10	46	75	92%	Highly Valid
	Total	199	173	179	148	201	929	1050	88%	Highly Valid

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Based on the data in Table 1, the average validation result of learning media in the form of learning videos in general is 88%. According to the validation criteria [28], the percentage is declared very valid. This means that learning media in the form of microlearning meets the criteria that have been listed in the validation sheet which consists of three aspects, namely the learning media aspect with a validity value of 86%, the learning material aspect with a validity value of 89%, and the language aspect with a validity percentage of 92%.

After being validated, the validator commented that the learning media in the form of learning videos is suitable for use as a media and learning resource for respiratory system materials at the high school/MA level. The validator also added suggestions for improving learning media in the form of learning videos, namely improving language, writing, menu captions, and correcting less focused images. The author added and corrected the media according to the advice of the validator.

At the practical stage, the author distributed the product in a limited manner to several students of phase F of SMA N 2 Solok totaling 104 people. At this stage of the pre-qualification test, learning media in the form of learning videos that have been validly used by biology teachers as a media and learning resource for students in the classroom by displaying them through laptop, computers, or *smartphone* and also as an independent learning medium for students at home by accessing video media that the author has uploaded on the application *YouTube*. This preliminarily stage is carried out once in class which will be held on January 2 - January 03, 2025.

The data on the results of the learning pre-curriculum in the form of learning videos obtained by the author was obtained from the questionnaire of teacher and student responses. The responses of their education were obtained from the distribution of questionnaires conducted by the author to 104 students of phase F of SMA N 2 Solok, while the author's teacher responses were obtained from questionnaires distributed to teachers. The stages to find out the practicality of this learning media in the form of learning videos are as follows:

Giving questionnaires to teachers

The dissemination of this questionnaire aims to find out the response and response of teachers to media infrastructure, where teachers are given a questionnaire response to learning media in the form of learning videos on respiratory system material at the high school/MA level. Furthermore, teachers are asked to fill out the response questionnaire after using media in learning. The results of the teacher response questionnaire can be seen in the table below.

Table 2. Results of the analysis of the Practicality Questionnaire of Teacher Response

No	Aspects	Practicality			Shoes	Maxs Score	%	Criterion
		V1	V2	V3				
1.	Design	20	18	24	62	75	82%	Very Practical
2.	Benefit	12	9	15	36	45	80%	Practical
3.	Language	12	12	15	39	45	86%	Very Practical
	Sum	**44**	**39**	**54**	**137**	**165**	**83%**	**Very Practical**

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Based on the results of the practicality questionnaire given to biology teachers, the results of the analysis of the questionnaire of teachers' responses to the practicality of the learning media are obtained learning videos are categorized as practical with a percentage of 83%.

Dissemination of questionnaires to students

Learning media in the form of learning videos that have been distributed in a limited manner in phase F of SMA N 2 Solok is then tested for practicality in its use for students. This practicality data was obtained from the results of filling out the response questionnaire of phase F students totaling 104 people. Furthermore, each aspect of the response questionnaire was analyzed to determine the level of practicality of the media that had been used. Broadly speaking, the results of the student response questionnaire on the practicality of learning media in the form of learning videos are presented in the table below.

Table 3. Results of the Questionnaire on the Practicality of Student Responses

No	Aspects	Sum	Max Score	%	Criterion
1.	Design	2083	2600	80%	Practical
2.	Benefit	1291	1560	82%	Very Practical
3.	Language	1262	1560	80%	Practical
	Sum	**4636**	**5720**	**81%**	**Very Practical**

Based on Table 3, the results of the practicality response questionnaire from 104 as a whole average percentage of 81% with a very practical category. Where for the design aspect gets a percentage of 80%, the benefit aspect gets 82%, and the language aspect gets a percentage of 80% with the practical category. These results show that learning media in the form of videos is practically used by students in learning.

Discussion

Based on the results of the validation of the learning media in the form of learning videos carried out by five validators consisting of 3 biology subjects, 2 lecturers who are experts in material and learning media stated that the learning developed was very valid with a score of 88% and met all aspects of assessment. The validation carried out in this study uses 3 aspects, namely the learning media aspect, the learning material aspect, and the language aspect from the media. This is by the opinion [12] of displaying objects that are small and the most rigid and are not found by students directly. So the existence of learning videos, can explain the material in the learning process and emphasize that the material that is packaged in multimedia has text, *Sound*, and videos according to the demands of the material.

In the aspect of learning media from learning media, the learning video received an average percentage of approval from five validators of 86% and was declared very valid. In the aspect of learning materials that include the suitability of learning outcomes, the suitability of learning objectives, the suitability of students' character, the way of delivering the material, the clarity of the material, the depth of the material, the breadth of the material, the suitability of the bibliography, and the suitability of the glossary. Getting a percentage with an average of 89% which can be declared very valid. This is by [12] stating that using learning video media there is a more efficient message so that students can communicate the learning material that is conveyed quickly.

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The last aspect assessed in the validity test of learning media in the form of learning videos is the linguistic aspect of the media obtained from the validation results of five validators with an average percentage of 92% with a very valid category. The assessment of media language is based on several components in the form of language suitability and language suitability with users. By [1], it states that communicative learning video media is video media whose content is easy for readers to digest, systematic, clear, and does not contain language errors. Agree with the opinion [12] that video media uses simple language that is easy to understand and uses general language, the exposure of information that appears is helpful and friendly to the user, including the ease of the user in responding and accessing according to their wishes.

Based on the explanation above, it has answered the formulation of the research problem "Is learning in Class XI high school/MA respiratory system material valid and practical?" by stating that it is very valid by the five validators and is suitable for use in the learning process by obtaining an average validity percentage of 88%.

Based on the results of the practicality test from three biology teachers and 104 phase F students at SMA N 2 Solok using learning media in the form of learning videos on respiratory system materials, the average percentage of teacher responses is 83% which is categorized as very practical to use and from the questionnaire of student responses, the average percentage is 81% which is categorized as very practical. The author obtained the results of the questionnaire of teacher and student responses through a practicality test that has been disseminated. This is by the findings [12] which state that videos can be used classically or individually and learning video media can be used by individual students not only in learning at school but also at home.

The results of filling out the questionnaire from the media aspect obtained a percentage value of 82% which was categorized as practical in the teacher response questionnaire, while the student response questionnaire obtained 80% which was categorized as practical. This is based on the questionnaire of teacher and student responses, it is known that the media developed is easy to operate by teachers in the classroom, besides it can be a practical independent learning medium for students. This is by the opinion [31] seen in the role of learning videos, the use of videos as teaching aids that can provide a new experience to students.

The benefit aspect of learning media gets a percentage from teachers, namely 80% which is categorized as practical, while the percentage of students is 82% which is categorized as very practical. Based on the results of the questionnaire of teacher and student responses, it can be seen that using the media developed in the form of learning videos is very practical for students and teachers. This is to the opinion [31] that learning videos aimed at making it easier for students to understand the learning material are not always to the needs and desires of students and provide experience to students to feel a certain situation and can present case studies of respiratory system material that triggers student discussions.

The last aspect, namely the linguistic aspect of learning media in the form of learning videos, received an assessment on the teacher's response with a percentage of 86% which was categorized as very practical, and on the student's response with a percentage of 80% which was categorized as practical. Based on the questionnaire of the responses of teachers and students with the variety of language or words used, the effectiveness of the sentences used, and the spelling used in the learning media in the form of learning videos on respiratory system materials.

Based on the explanation above, it can be concluded that practical in the form of learning media in the form of learning videos of respiratory system material gets a percentage of 83% with the category of very practical from the teacher's response, while from the response of students which in the questionnaire the students get a percentage of 81% which is categorized as very practical.

From these results, the formulation of the research problem "Is learning in the respiratory system material of class XI SMA/MA Valid and practical?" by obtaining a very practical and practical category by the three biology teachers and 104 students who can be used in the learning process.

IV. CONCLUSION

Based on the results of the research, it can be concluded that learning in the form of learning videos in the respiratory system material of class XI SMA/MA was obtained with a very valid percentage of 88% and very practical with a percentage of 83% from teachers and with a percentage of students as much as 81%. So that the learning media isk Learning videos can be used in the learning process that will take place.

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