



Development of *VideoScribe* Assisted Learning Media to Improve Understanding of Physics Concepts

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Abstract: This research is development research that aims to: describe the feasibility of VideoScribe-assisted learning media, practitioners' assessment of VideoScribe-assisted learning media, the effectiveness of VideoScribe-assisted learning media in physics learning, and produce VideoScribe-assisted learning media. The subjects of this research trial were 20 students in class XI IPA 3 at SMAN 6 Sinjai. This study uses the ADDIE model development. The instruments used in this study were learning media validation sheets, practitioner response questionnaires and students' conceptual understanding test instruments. The eligibility criteria for learning media are seen from the aspect of its validity. The practicality criterion is seen from the practitioner's assessment of the learning media, and the criteria for its effectiveness are seen from the increase in students' concept understanding test results. Based on the results of the analysis, it can be concluded that the VideoScribe assisted learning media developed, based on expert judgment using the Aiken V index analysis, is declared valid and feasible to use with a small revision of the VideoScribe assisted learning media. In terms of the response of physics teacher practitioners, it is in the very good category; and the effectiveness of VideoScribe-assisted learning media seen from students' conceptual understanding abilities analyzed by N-gain obtained an average value of 0.64 in the medium category which means that there is an increase in students' conceptual understanding abilities so that it can be said that VideoScribe-assisted learning media is developed effectively in improving students' conceptual understanding abilities.

Keywords: Learning media; Effectiveness; Understanding of the concept

Introduction

In this era of globalization, Information and Communication Technology (ICT) is developing rapidly, which forces the world of education to carry out positive innovations for the advancement of education. One of the functions of educational technology is that it can change conventional learning methods into non-conventional ones (Sakti, 2019). With the development of technology, it has an impact on the progress of the learning media used today (Yaumi, 2018). Technology and information are a solution for learning today. Learning media has advanced and developed along with the birth of the communication revolution which is used for learning purposes in addition to pre-existing media such as teachers, textbooks and blackboards (Yaumi,

2018). One of the determinants of creating quality education is where the teacher is the main actor in the educational process. In their duties and functions in education, teachers are required to have the ability to choose methods and design learning activities that can make students active; providing interactive learning resources and being able to choose learning media that allows students to easily absorb information and is able to foster student learning motivation, especially in physics subjects (Fadillah, 2019)

Physics lessons are lessons that teach a variety of knowledge that can develop reasoning power, analysis so that almost all problems related to nature can be understood (Sinilingga, 2012). From this statement, students are required not only to remember or recall lessons. But more than that students are able to define.

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This shows students have understood the subject matter. In the cognitive domain of Bloom's taxonomy, understanding is a type of learning that is higher than knowledge. Anderson, divides understanding into three aspects, namely translation, interpretation, and extrapolation. The concept is an abstraction that represents a class of events, objects, or several things that have something in common (Hamdani, 2012). Research on understanding physics concepts in general still uses conventional methods, still uses pencil and paper media and is considered less practical (Yana, 2019). The ability to understand concepts is a student's way of thinking to explain a concept that has been learned using their own language. According to Skemp (Suraji, 2018);

The quality of a learning process, apart from being influenced by the learning model, is also influenced by the learning media. Learning that is carried out by utilizing information and communication technology depends on the teacher's role as a facilitator (Hanum, 2013). Learning media are needed that can stimulate the thoughts, feelings and attention of students when the teaching and learning process takes place. Therefore, we need independent learning media that can make learning more interesting. Understanding the concept is one of the main aspects that need attention in learning physics because it can affect student learning outcomes (Sastrika 2013). One of the learning media that can improve students' reasoning abilities and attention, can be trained by increasing visualization power using physics learning videos. Learning videos can make learning physics more interesting, interactive and communication that places more emphasis on the process of forming knowledge actively, and is able to maintain students' attention during the learning process (Resta, 2013). Video is a type of learning media that uses images, sound, and several animations as illustrations of events from the material being studied, with the hope that this product (video media development) can provide a real picture of what students are learning (Rozie, 2013). With unique characteristics, Sparkol VideoScribe is able to present learning content by combining attractive images, sounds and designs so that students are able to enjoy the learning process. In addition, users can also dub and input sound as needed to make videos (Fadillah, 2019).

VideoScribe is a software used by teachers and students to create blackboard-shaped animations to increase interest and retention in learning. Videoscribe can enhance learning by combining audio and visual (Rahmawati, 2016). Based on the research results of Basri and Khatimah, (2019), it was found that the use of sparkol videoscribe learning media can improve physics learning outcomes in class XI students of SMA Negeri 6 Jenepono. Therefore the use of VideoScribe-assisted learning media can support the teaching and learning process so that it can train students' understanding of

concepts. Sparkol VideoScribe has many animations, especially what is distinctive is being able to write by hand according to what we want to write, it's like an educator who is having fun delivering material to students but is included in the Sparkol application (Sunarni, 2016). Based on the results of Sakti's research (2019) shows an illustration that the average score of the experimental class using VideoScribe learning media is higher than the control class without using VideoScribe learning media with an average experimental class of 27.55 and a standard deviation of 5.32 while in the control class with an average score of 23.86 and a standard deviation of 4.81. In other words, the concept is the result of the thoughts of a person or group of people expressed by definitions, laws and theories. In the process of learning physics, teachers must be able to make students not only memorize and know about physics concepts, but also must be able to make students understand and understand these concepts, and link their interrelationships with other concepts (Kulsum, 2014). Based on the results of Irma's research (2018), it was found that there were differences in understanding physics concepts between the control class and the understanding of physics concepts in the experimental class using VideoScribe-based learning media. So that VideoScribe-assisted learning media can be used to measure students' understanding of physics concepts. The purpose of this study was to describe the feasibility of VideoScribe-assisted learning media, practitioners' assessment of VideoScribe-assisted learning media, the effectiveness of VideoScribe-assisted learning media in physics learning, and produce VideoScribe-assisted learning media.

Method

This type of research is Research and Development (R&D) development research. The development model used in this study is the ADDIE model, namely, the analysis stage, the design stage, the development stage, the implementation stage and the evaluation stage. The development stage cycle is described in Figure 1.

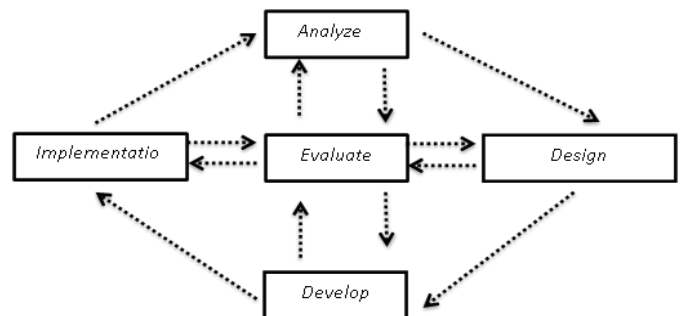


Figure 1. The ADDIE Model Stage Cycle (Tegeh and Pudjawan, 2014)

The data needed in the research, researchers used data collection techniques in the form of validation, questionnaires and tests of understanding of physics concepts. This research uses research subjects class XI IPA 3 totaling 20 people. Held in the Even Semester of the 2021/2022 Academic Year and at SMAN 6 Sinjai. The research design used is "Pre-test and Post-test Group". According to Arikunto (2013) the trial design is described as Figure 2

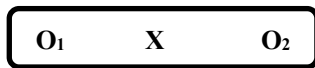


Figure 2. Research Trial Design

Information :

X : Treatment (independent variable)

O₁: Pre-test (before the application of assisted learning media *VideoScribe*)

O₂: Post-test (after the application of assisted learning media *VideoScribe*)

The analysis used to determine the level of relevance by the three experts used the content validation coefficient (Aiken's V). by using the Formula1:

$$v = \frac{\sum s}{n(c-1)} \tag{1}$$

Information:

V : Index of expert agreement regarding item validation

s: The difference in the score determined by each expert with the lowest score in the category used

s : r-Io

r : Rater set score

Io : The lowest rating score

n : The number of experts

c : The highest validity rating score

Practitioner questionnaires were carried out by giving scores based on the provisions of the Likert scale. The step for determining the category for the teacher response questionnaire can be determined by the equation in Table 1 below:

Table 1 Teacher/practitioner Assessment Categorization

Formula	Classification
$X > X_i + 1.8 \times sb_i$	Very good
$X_i + 0.6 \times sb_i < X \leq X_i + 1.8 \times sb_i$	Well
$X_i - 0.6 \times sb_i < X \leq X_i + 0.6 \times sb_i$	Enough
$X_i - 1.8 \times sb_i < X \leq X_i - 0.6 \times sb_i$	Not enough
$X \leq X_i - 1.8 \times sb_i$	Very less

(Widoyoko, 2009)

The effectiveness of *VideoScribe*-assisted learning media can be seen through the ability to understand the concepts of students in class XI IPA 3 SMAN 6 Sinjai by calculating the percentage concept comprehension test

scores. Percentage of concept understanding tests for students in each item using the criteria according to Table 2.

Table 2. Criteria Score Assessment Score Understanding of Student Concepts

Percentage (%)	Category
0 - 20	Very less
21-40	Not enough
41-60	Enough
61-80	Well
81-100	Very good

(Riduwan, 2011)

To find out the increase in students' understanding of concepts, an analysis was carried out using N-gain analysis. According to Sundayana (2014) as follows:

$$\text{Normalized Gain (G)} = \frac{X_{\text{Posttest}} - X_{\text{Pretest}}}{X_{\text{Max}} - X_{\text{pretest}}} \tag{2}$$

Information:

g : Gain score is normalized

X_{Pretest} : Pretest scores (preliminary test)

X_{Posttest} : Posttest score (final test)

X_{Max} : Maximum score

The N-gain criteria categorized by Sundayana (2014) can be seen in Table 3.

Table 3. N-Gain Criterion

N-Gain Value	Interpretation
0.70 < g ≤ 1.00	Tall
0.30 < g ≤ 0.70	Currently
0.00 < g ≤ 0.30	Low
g = 0.00	No increase
-1.00 ≤ g < 0.00	There was a decline

(Sundayana, 2014).

Result and Discussion

The results of the validation analysis of *VideoScribe*-assisted learning media. Product content validity is carried out by presenting several experts who are experts to assess the new product that has been designed. Each expert or expert is asked to assess the product that has been made to find out the weaknesses and strengths of the product that has been designed (Sugiyono, 2018). The validation analysis that has been carried out shows that *VideoScribe*-assisted learning media is declared feasible/valid.

Media that is declared valid means that *VideoScribe*-assisted learning media as a whole contains or materials and components of the media are related consistently to one another. The component in question is the suitability of the content presented with the basic competencies and the applicable curriculum, linking the material to problems that are often encountered in everyday life, using language that is easy to understand.

As stated by Rochmad (2012) that a development result (product) is said to be valid if the product is based on adequate theory and all components of learning products relate to each other consistently. The results of the analysis of the validity of the VideoScribe-assisted learning media that have been developed show that the VideoScribe-assisted learning media is feasible or valid to be tested based on expert judgment using a Likert scale and can be seen in Table 4.

Table 4. Validation Analysis of VideoScribe assisted learning media

Aspect	Gain Score	V	Category
Material	54	0.87	Valid
Media	52	0.82	Valid
Language	50	0.82	Valid
Average	52	0.82	Valid

Practitioners' evaluation of VideoScribe-assisted learning media can be seen from the practitioner's questionnaire sheet which has been validated and declared valid, then given to practitioners to see their response to the implementation of VideoScribe-assisted learning media. Practitioners who provided an assessment of the implementation of VideoScribe-assisted learning media totaled 10 physics teachers. 2 physics teachers came from SMAN 6 Sinjai and 8 physics teachers came from several equivalent high schools throughout South Sulawesi while the students were from class XI IPA 3 SMAN 6 Sinjai.

The practitioner's response questionnaire consisted of 15 statements related to the learning process using VideoScribe-assisted learning media including statements about material aspects, media aspects and language aspects. Practitioner response questionnaire assessment using a Likert scale. The results of the analysis of the practitioner's response questionnaire each obtained a very good category. This means that the VideoScribe-assisted learning media developed is easy

to use in the learning process so that you can easily understand physics concepts in order to easily solve the given physics problems.

Table 5Practitioners' Assessment of Media Development (*Help Video Scribe*)

Teacher / Practitioner Assessment										Amount	Average
1	2	3	4	5	6	7	8	9	10		
4	4	4	4	3	4	4	3	3	3	36	3.6
3	4	3	4	4	4	4	4	4	3	37	3.7
3	4	4	3	3	3	4	4	3	4	35	3.5
3	3	4	3	4	3	4	3	4	4	35	3.5
4	4	4	4	4	3	3	3	3	4	36	3.6
3	4	3	4	3	4	3	4	4	3	35	3.5
3	4	4	4	4	3	4	4	3	3	36	3.6
3	4	4	4	4	3	4	4	3	4	37	3.7
4	4	4	4	3	4	4	4	3	4	38	3.8
3	4	4	4	3	4	3	4	4	4	37	3.7
3	3	4	3	3	4	4	3	3	4	34	3.4
4	4	4	4	4	4	4	3	3	4	38	3.8
3	4	4	3	3	4	3	3	4	4	35	3.5
4	3	3	3	4	3	3	4	4	4	35	3.5
4	4	3	3	4	3	3	3	3	4	34	3.4

The use of VideoScribe-assisted learning media can be seen based on the results of tests on the ability to understand the concepts of students in class XI IPA 3 SMAN 6 Sinjai. Concept understanding ability tests are given before and after being given VideoScribe-assisted learning media in physics learning. This is shown in the activeness of students in the learning process using the VideoScribe-assisted learning media that has been developed. The media presents material related to everyday life, so that students are active in understanding the concepts given by static fluid material. When the teaching and learning process begins, students are shown videos so that learning is more interactive and emphasizes material to everyday life so that students can see a real picture of the material being discussed.

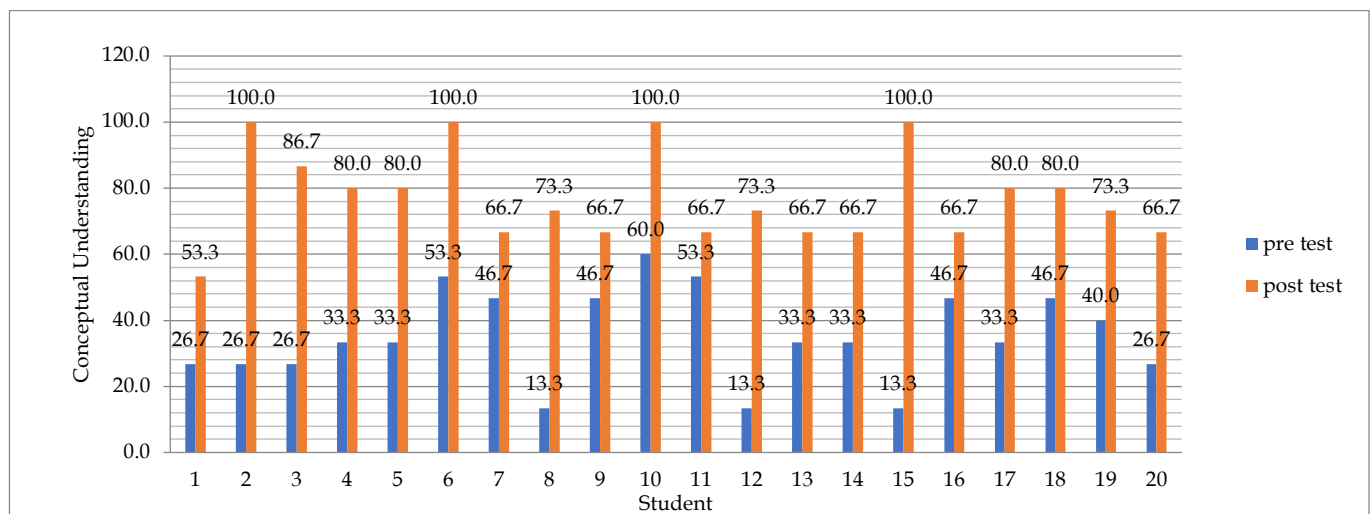


Figure 3. Pre-test and Post-test of Concept Understanding Ability

The results of students' initial concept understanding test results (Pretest) were in the poor category. As for one of the factors that influence this is due to the lack of use of learning media that is used with the learning styles of students so they lack an understanding of the basic concepts of physics. Furthermore, VideoScribe-assisted learning media is given to students and a final test is given after being given VideoScribe-assisted learning media so that the results of the final concept understanding ability test (Posttest) are in a good category.

The results of students' conceptual understanding ability tests before and after using VideoScribe-assisted learning media, then N-Gain analysis was carried out to see whether there was an increase in students' conceptual understanding. The results of the analysis obtained the full N-Gain average value which can be seen in Appendix C12 which shows that there is an increase in students' conceptual understanding abilities in the medium category. Based on this, VideoScribe assisted learning media has been developed to be effective in increasing students' conceptual understanding abilities. The results of the N-gain analysis can be seen in Figure 3.

Conclusion

Based on the results of the research and discussion described above, it was concluded that the percentage increase in the competence of physics teachers in Pasaman Barat Regency in making PjBL-based physics teaching aids was 24.17%. In addition, the mentoring activities provided effectively increased the mastery of MGMP Physics teachers in the Pasaman Barat Regency of PjBL learning model material, making PjBL-based teaching aids and making PjBL-based physics practicum worksheets.

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