The Variety of Teaching Material on Online Learning and Physics Learning Outcomes in Gorontalo District High Schools

by Tirtawaty Abdjul

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Abstract - *This study discusses the variety of teaching materials in BOLD learning and physics learning outcomes in high schools, with the aim of knowing what materials are used in BOLD learning and to find out student learning outcomes in BOLD learning. The data analysis used in this research is quantitative descriptive analysis. Descriptive research in this study describes the teaching materials used by teachers in BOLD learning, while quantitative is used to see the learning outcomes of students after using these teaching materials. Based on the results of the research, the teaching materials used in BOLD learning are in the form of electronic modules, textbooks, and PowerPoint slides. Student learning outcomes after using the teaching materials are above the predetermined KKM score. The average student learning outcomes after using online learning teaching materials in four schools is above 70, with one school having the average learning outcome of 83 with good criteria, while three other schools obtain scores of 71, 72, and 73 with sufficient criteria. So, it can be said that the variety of teaching materials used in online learning can improve student learning outcomes.*

Keywords: Variety; Teaching Materials; Physics Learning Outcomes

INTRODUCTION

At the beginning of 2020, we were dismayed by the corona virus outbreak that spread to all corners of the world, one of which was to Indonesia. The existence of this virus outbreak has an impact in all fields such as education, social, economy and tourism. The current COVID-19 pandemic has drastically changed the way we work, communicate and socialize. Learning must always continue, even though there is a global pandemic disaster that makes the government enforce learning from home in the world of education. The perfect solution for this pandemic is online learning.

According to Pohan (2020: 2) online learning is the learning that takes place in a network where the teacher and those being taught do not face each other directly. Online learning can be done anywhere and anytime, depending on the availability of the supporting tools used. The principle of online learning is the implementation of meaningful learning, namely a learning process oriented towards interaction and learning activities.

To attract students' interest in learning, it is necessary to present interesting material when online learning begins. An attempt that teachers can do to attract students' interest is developing the presentation of the material to be taught. Material is one of the components in a learning implementation plan (hereinafter RPP) after learning objective formulation. According to Majid in (Kosasih, 2014: 31) subject matter is all forms of material used in the implementation of teaching and learning activities. The presentation of materials can be done using various ways, such as text books, modules, PowerPoint slides, handouts, videos, comics, posters and so on.

Teaching materials are defined as subject matters that are compiled comprehensively and systematically based on the learning principles used by teachers

and students in both offline and online learning process. Rusyana (2003) stated that teaching materials are learning media whose function is to help teach students systematically and directedly according to the goals that have been set. Teaching materials must contain materials that are structured for learning. Rusyana's opinion is reinforced by other experts, namely Chomsin S. Widodo and Jasmadi (2008), who stated that teaching materials are a set of tools/media that contain subject matters, methods, limitations, and ways of evaluating, which are designed systematically and attractively in order to achieve the expected objective, namely achieving competencies and sub-competencies in all their complexities.

A similar opinion was expressed by Prastowo (2014:17) who stated that teaching materials are all materials that are systematically arranged, that display the complete frame of the competencies which will be mastered by students and used in the learning process, with the aim of planning and reviewing the implementation of learning. Teaching materials must contain materials that are well structured for learning. Another opinion was expressed by Panggabean (2020: 3), stating that teaching materials are all kinds of materials, information, tools and texts used by teachers to assist them when conducting teaching and learning process activities.

To date, Physics remains as a subject that is considered difficult by students. This is because students don't really like physics subjects. So, teachers need to increase students' motivation and enthusiasm in learning. With a great enthusiasm for learning, they will get good grades, but in reality, from the results of the assessment given, there are still many students who get scores below the Minimum Passing Score (hereinafter KKM) that has been set. Not

only that: in the teaching and learning process for physics subjects, students still feel less motivated in participating in physics learning. In the teaching and learning process, the teacher has a duty to deliver material as well as to develop the topics of the learning in order to provide optimum learning outcomes. Student learning outcomes are greatly influenced by the way the teacher presents learning materials—especially during online learning such as today.

According to Rifa'i and Anni (2011: 82), learning outcomes are changes in behavior obtained by students after experiencing learning activities. The learning outcomes obtained by the students as a learning experience can be classified into 3 learning domains, namely the cognitive, affective, and psychomotor domains. Learning outcomes are the main proof of the learning process because within them are revealed, a change in behavior as an evident reflection of the learning activities.

Based on the description of the background above, the researcher is interested in conducting research entitled "**The Variety of Teaching Materials on Online Learning and Physics Learning Outcomes in High Schools**" in order to observe and describe what teaching materials are used by teachers as well as how the students' learning outcomes when using these teaching materials are.

RESEARCH METHODS

The type of research used is descriptive quantitative research which aims to describe what teaching materials are used during online learning and student learning outcomes in physics learning. The research instrument used observation sheets and tests. The number of respondents is 310 from four

schools. The data obtained were later analysed descriptively and quantitatively.

Data collection techniques used in this study are observation sheets and test methods. The data analysis technique consists of the analysis of data on various teaching materials as well as the analysis of data on learning outcome test.

Analysis Method:

Observation sheet data analysis

$$\text{Score percentage } = \frac{\text{answer score}}{\text{maximum score}} \text{ x } 100\% \ldots (1)$$

The criteria for each sub-aspect can be seen in Table 1.

Table 1. Criteria for each sub-aspect

Percentage (%)	Criteria
86 – 100	Very good
75 – 86	Good
66 – 75	Satisfactory
56 - 65	Less than satisfactory
0 – 55	Poor

(Setiani et al., 2015)

Learning Outcome Test Data Analysis

Quantitative data was obtained from student learning outcomes through tests or evaluations given, with the aim of observing student learning outcomes. In calculating the percentage, the following formula is used:

$$X = \frac{\sum X}{\sum N} \text{ x } 100\% \qquad (2)$$

Description:

X = Average Score

$\sum X$ = Sum of all student scores

$\sum N$ = Number of students

The following are the categories for average scores, which can be seen in Table 2.

Table 2. Average score category

Percentage (%)	Criteria
86 – 100	Very good
75 – 86	Good
66 – 75	Satisfactory
56 - 65	Less than satisfactory
0 – 55	Poor

(Sukardi, 2013)

RESULTS AND DISCUSSION
Results

Based on the results of initial observations, the teaching materials used in SMA Negeri (State Senior High School) 1 Telaga, SMA Negeri 1 Telaga Biru, and SMA Negeri 1 Limboto used the same 3 teaching materials, namely textbooks, electronic modules, and PowerPoint slides. Meanwhile, SMA Negeri 1 Tilango only used teaching materials in the form of electronic modules.

The results of observations on the teaching materials in the form of textbooks, electronic modules and PowerPoint slides used in four schools, namely SMA Negeri 1 Telaga, SMA Negeri 1 Telaga Biru, SMA Negeri 1 Limboto and SMA Negeri 1 Tilango were assessed based on the provisions of the National Education Standards Agency (hereinafter BSNP). The results of the assessment can be seen in the table.

Table 3. Score Percentage Result for Electronic Module Teaching Material Based on BSNP's Four Aspects of Assessment

No.	Assessment Aspect	Average (%)
1.	Content Feasibility	81.53%
2.	Presentation Feasibility	74%
3.	Language Feasibility	79.17 %
4.	Graphics	78%

As seen on Table 3, the percentage of the average score of the teaching materials in the form of Physics Learning Module for Class XI of Senior High Schools used in the four schools are 83.51%, 74%, 79.17% and 78% for content feasibility, presentation feasibility, language feasibility and graphic feasibility aspect respectively—all of which are in the criteria of 'good'.

Table 4. Score Percentage Result for Textbook Teaching Material Based on BSNP's Four Aspects of Assessment

No.	Assessment Aspect	Average (%)
1.	Content Feasibility	82.31%
2.	Presentation Feasibility	83.33%
3.	Language Feasibility	81.66 %
4.	Graphics	66%

As seen on Table 4, the percentage of the average score of the teaching materials in the form of Physics Student Books for Class XI of Senior High Schools (Revised 2016 Edition) used in the four schools are 82.31%, 83.33%, and 81.66% for content feasibility, presentation feasibility and language feasibility aspects respectively—all of which are in the criteria of 'good'. As for graphic feasibility aspect, the criteria are sufficient, with an average of 74%.

Table 5. Score Percentage Result for PowerPoint Slides Teaching Material Based on BSNP's Four Aspects of Assessment

	Assessment Aspect	Average (%)
a. SMA Negeri 1 Telaga's PowerPoint slide teaching materials		
1.	Content Feasibility	64%
2.	Presentation Feasibility	68%%
3.	Language Feasibility	74.83%
4.	Graphics	63.3%
b. SMA Negeri 1 TelagaBiru's PowerPoint slide teaching materials		
1	Content Feasibility	75%
2	Presentation Feasibility	72%
3	Language Feasibility	78.33 %
4	Graphics	80%
c. SMA Negeri 1 Limboto's PowerPoint slide teaching materials		
1.	Content Feasibility	76%
2.	Presentation Feasibility	78%
3.	Language Feasibility	79.17 %
4.	Graphics	73%

As seen on Table 5, the PowerPoint slide teaching materials used in the four schools obtained different average score percentages. The PowerPoint slide teaching materials used in SMA Negeri 1 Telaga obtain an average score of 64% with 'less than satisfactory' criteria for content feasibility aspect, 68% with 'satisfactory' criteria for presentation feasibility, 74.83% with 'satisfactory' criteria for language feasibility, and 63.33% with 'less than satisfactory' criteria for graphic feasibility. The PowerPoint slide teaching materials used at SMA Negeri 1 Telaga Biru obtain an average score of 75% with 'good' criteria for content feasibility aspect, 72% with

'satisfactory' criteria for presentation, 78.33% with 'good' criteria for language feasibility and 80% with 'good' criteria for graphic feasibility. The PowerPoint slide teaching materials used at SMA Negeri 1 Limboto obtain an average score of 76% with 'good' criteria for content feasibility aspect, 78% with 'good' criteria for presentation feasibility, 79.17% with 'satisfactory' criteria for language eligibility aspect and 73%, also with 'satisfactory' criteria for graphic feasibility.
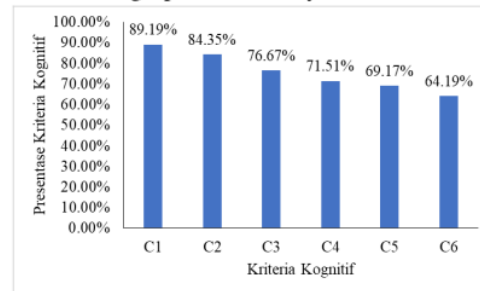

Figure 1. Cognitive level analysis diagram

As seen on Figure 1, the cognitive criteria of C1 to C4 have higher percentages than the cognitive criteria of C5 and C6.

The study's data on learning outcomes were obtained through learning outcome tests in the form of multiple-choice questions. The average learning outcomes of the students in each school can be seen in the following table:

Table 6. Learning Outcome Average Score

School	Learning Outcome Average Score	Criteria
SMAN1 Limboto	83	Good
SMAN 1 Telaga Biru	72	Satisfactory
SMAN 1 Telaga	71	Satisfactory
SMAN 1 Tilango	73	Satisfactory

Based on Table 6, the average score of student learning outcomes in the four schools where the research was conducted are above the KKM, which was set at 70 for all the four schools.

Discussion

Based on the research results elaborated, the average score percentage for the assessment of the teaching materials used in online learning is in accordance with BSNP for each aspect of content feasibility, presentation feasibility, language feasibility, and graphic feasibility.

As seen in the results of the study, the electronic module got an average score of 81.52% with very good criteria for content feasibility aspect. In the electronic module, the materials are presented in accordance with the basic competencies and learning objectives, with explanations that construct students' knowledge. It also includes examples of questions and practice questions that support the concepts so as to help students understand the material. As a whole, the electronic module has met several indicators taken from the National Education Standards Agency or BSNP, which consists of 4 sub indicators with thirteen assessment points. The accuracy of the material on the concepts of wave presented in this module is in accordance with the applicable definitions in physics. However, in conveying the concept of finding the wave phase, the module has yet to explain, in detail, how the equation was obtained, causing misinterpretation.

For presentation feasibility aspect, the electronic module was categorized as good with an average score of 72% and a criterion of 'satisfactory'. In each sub-chapter in the electronic module (e-module) the learning objectives of the sub-chapter material are stated, so that students can understand the subject matter to be studied. The concepts presented are coherent, starting from the easy ones to the difficult ones. The materials elaborated were not repeated excessively. The practice questions given on the material of traveling waves and stationary waves are pretty diverse with various levels of difficulty. The pictures and illustrations presented are appropriate and easy to understand.

The electronic module obtained an average score of 81.66% with very good criteria for assessment on the language feasibility aspect. The sentences used are straightforward, communicative, dialogical and interactive—it does not use repeated sentences and hence they are easy to understand. The material presented is straightforward, meaning that in general the material presented has used dictions and sentence structures that are in accordance with Indonesian language rules. However, there are some words that are not written in accordance with Indonesian language rules, that is the word "amplitude" on page 8, which should be written as "amplitudo". In addition, the word "disimbulkan" on page 12 should be replaced with "disimbolkan". In general, sentence structures that are of students' own level of development have been fulfilled. The use of symbols, numbers and letters are written following the applicable rules. For the communicative aspect, the understandability of the message or information in the module is good and the delivery of information through visual, that is, with images, is easy to understand.

For graphic aspect, an average of 78% with a criterion of good is obtained. However, the cover illustration has not described the content of the material. The use of the font type and size is clear, the layout of the content and images is good, and lastly, the images have explained the content of the material. Thus, the electronic module used by the teacher already contains a material that meets content, presentation, language and graphic aspect standards according to BSNP.

Physics Student Books for Class XI of Senior High Schools (Revised 2016 Edition)

Based on the physics textbook assessment instrument developed by the researcher, the aspect of content feasibility of the book is categorized as good with an average score of 82.31%, on the grounds that the wave material discussed in Physics Student Books for Class XI of Senior High Schools by Pujianto et al., which was published by the Ministry of Education and Culture has suited the learning objectives and has covered all the material contained in the Basic Competences (hereinafter KD) for the wave material. Nevertheless, the book has not directly mentioned the learning objectives, and thus the students cannot understand the learning objectives of the chapters to be studied.

The language feasibility aspect, as shown in the table for textbook aspects, obtained an average score of 81.66% with very good criteria. The sentences used are straightforward, communicative, dialogical and interactive; it does not use repeated sentences and hence they are easy to understand.

The graphic feasibility aspect obtained an average score of 66% with 'good' criteria from two assessors. The cover illustration has described the content of the material, whereby a person playing a guitar is one example of the application of stationary wave with fixed ends. The font used is good and clear. The layout of the letters, pictures, formula notation and numbers is good. The illustrations are also good and clear. Therefore, the textbook used by the teacher has already contained a material that meets content, presentation, language and graphic aspect standards according to BSNP.

Meanwhile, the PowerPoint slide teaching materials used in SMA Negeri 1 Telaga, SMA Negeri 1 Telaga Biru and SMA Negeri 1 Limboto had been categorized as good. The materials presented had suited the basic competencies with an explanation that builds students' knowledge. The concepts are presented from the easiest to the most difficult. There isn't any aid in the form of examples of problems that are associated with everyday life to support the presentation. Pictures and illustrations presented are suitable. The coherence and order of the flow of thought are pretty appropriate for the learning activities.

The teaching materials used by teachers in online learning are in accordance with the criteria for teaching materials according to the National Education Standards Agency (BSNP) and are good to be used in online learning. This research is similar to research conducted by (Karina, 2016) in which the results of the research show that at the level of variation in the presentation, the books 'Fisika 2B untuk SMA/MA Kelas XI' (Physics 2B for Class XI of Senior High Schools), 'Sains Fisika 2 SMA/MA Kelas XI' (Physics Science for Class XI of Senior High Schools), and 'Fisika untuk SMA/MA Kelas XI' (Physics for Class XI of Senior High Schools) are categorized as good. Subsequently, the level of appeal in the images had good criteria. Similarly, the illustrations presented in the Physics textbooks for Class XI also help with the understanding of the text, hence resulting in the criteria of good.

Students' learning outcomes have undergone significant increase, which can be seen from the students' achievement for each cognitive level, whereby the percentage of the results of SMAN 1 Limboto students' learning outcomes reaches an average of 83%. This is in line with research conducted by Sukardi's (2013), which proved that students' cognitive abilities are categorized as good.

Students' learning outcomes have undergone an increase, as seen from the students' achievement at each cognitive level in which are obtained, an average

percentage of 72% for learning outcome test results of SMAN 1 Telaga Biru students, an average percentage of 71% for learning outcome test results of SMAN 1 Telaga students, and an average score of 73% for SMAN 1 Tilango. This is in line with Sukardi's (2013) research, which proved that the students' cognitive abilities are categorized as 'satisfactory'.

Based on the learning outcome tests given to 310 respondents who were divided in four schools, namely Class XI of SMA Negeri 1 Telaga, SMA Negeri 1 Telaga Biru, SMA Negeri 1 Limboto and SMA Negeri 1 Tilango, it is noted that on the test given, the scores obtained by the students was above the KKM, which was 70. In other words, the use of teaching materials during online learning greatly affects student learning outcomes, as proven by the average of student learning outcomes exceeding the predetermined KKM.

The results of this study are in line with research conducted by (Tatang, 2016), which states that learning using PowerPoint affects student learning outcomes. It is also in line with research conducted by (Fitri Rahmawati, 2020) which concluded that the use of PowerPoint in online learning is interactive towards student learning outcomes. This was indicated by the average student score that was above the predetermined KKM. In addition, research conducted by (Imania, 2018) concludes that the use of online physics modules is effective in improving student learning outcomes—which is proven by the average outcome score of the learning that used online physics modules being 79, reaching the predetermined KKM.

Based on the results of this study, there seem to be a cognitive difference in the variety of teaching materials used in online learning and student learning outcomes in high school, in which C1 (explaining) and C2 (understanding) abilities tend to be high, while C5 and C6 are lower than the other cognitive abilities.

CONCLUSIONS

The teaching materials used during online learning are electronic modules (e-modules), textbooks and PowerPoint slides. The teaching materials used were in accordance with the teaching materials set by the BSNP. Student learning outcomes varied after the use of these teaching materials. The average learning outcomes for students of SMA Negeri 1 Limboto are 83 with good criteria, while for students of SMA Negeri 1 Telaga Biru, SMA Negeri 1 Telaga and SMA Negeri 1 Tilango, 72, 71, and 73 respectively. Here, all of them are classified under 'satisfactory' criteria.

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