The Use of PowerPoint and Video as Learning Media in Online Learning and Physics Learning Outcomes in High School

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Abstract - *This study aims to discover and see how power points and videos are used during online learning as well as its effects on student learning outcomes in online learning on light wave material in class XI Science SMA Negeri 1 Bongomeme, SMA Negeri 1 Dungaliyo and SMA Negeri 1 Tibawa. The research method used is descriptive quantitative. The research subjects were 283 students of class XI science. Data collection techniques used were questionnaires and learning outcome tests. The data analysis technique used were descriptive and quantitative analysis. The results of this study indicate that, based on their respective indicators, the use of power points and films/videos in online learning obtain a percentage value of 80.25% and 79.97% respectively, both of which are included within the criteria of strong. On average, the student learning outcomes in three schools are above minimum require score (KKM) of 75. Here, the average value of student learning outcomes at SMA Negeri 1 Bongomeme 77.52, SMA Negeri 1 Dungaliyo 79.18, SMA Negeri 1 Tibawa is 80.91.*

Keywords: Learning Media; Online Learning; Learning Outcomes

INTRODUCTION

The development of the world of education is highly significant. Its development goes along with the development of science and technology. The world of education is always expected to follow in the footsteps of global technological developments (Patelli et al. 2017). This hence becomes a demand, because education is the main capital in building the younger generation, educating the nation's life, and preparing themselves to become a workforce that is reliable and competitive.

Learning process is the interactive activity that occurs between teachers and students in class (Ramadhan et al., 2021). This process involves learning and teaching activities that can determine student's success and that which is done to achieve educational goals. Learning is a change in behavior that occurs in individuals, whereby those who are previously unable to do something hence becomes able or proficient (Hilna et al., 2020).

The learning process nowadays is different from that carried out before this period of time. This is because, at the present time, the world is currently experiencing coronavirus outbreak. Coronavirus itself is a large family of viruses that cause illness, whose symptoms range from mild to severe. On January 30, 2020 WHO has declared a public health emergency which in turn worries the world. On March 2, 2020, Indonesia reported 2 confirmed cases of COVID-19 (Wahyu, 2020).

Due to the current development of information technology, learning can be done remotely. This is usually known as E-Learning. Basically, E-Learning requires some supporting devices to support the learning (Maatuk et al. 2021). These includes devices such as smartphones, tablets, laptops and computers that can be used to access information.

In choosing and using a learning media during the learning process, the teacher is not restricted by any rules. But the teacher must use a media that can be used by students so that the communication in learning can be done properly (Pramana, 2021). Some learning media that can be used are: picture media, sketches, charts/charts, projector slides, videos and so on.

Learning outcomes in education are proofs that a person succeeds in pursuing a teaching and learning process which theoretically provides a distinctive style for students to internalize and practice their knowledge in accordance with the abilities they acquire. Teachers are the main factor in improving student learning outcomes (Puspitarini & Hanif, 2019). This is because the teacher knows the steps and levels of each student. With this research, it is hoped that student learning outcomes will increase more than expected.

Explorations on previous research discovered research that is relevant to this research. Although there are some relations in the discussions, this research is still very different from previous research. One of the previous research under the title of 'Using Power Point Interactive Media in Online Learning' by Fitri Rahmawati used the Pre-Experimental method. In this research, the class used was class XI IPS 1 with 31 students. The evaluation results show that the average student learning outcomes after using learning media is 80.81, a score that is greater than the specified minimum score (KKM), which is 75 (Rahmawati et al., 2020).

Based on the current condition of the Covid 19 pandemic and based on the results of previous research explorations, researchers need to study more deeply about how to use power point and videos as learning media when online learning takes place. Therefore, the researchers conducted research in three schools in Gorontalo Regency, namely SMA N (State Senior High School) 1 Bongomeme, SMA N 1 Dungaliyo and SMA N 1 Tibawa with a total of 283 respondents. For this reason, the researcher intends to conduct research with the title "The Use of PowerPoint and Video as Learning Media in Online Learning and Physics Learning Outcomes in High School".

RESEARCH METHODS

The type of research used by the researchers is quantitative descriptive research. Descriptive research is research that provides a more detailed description of the existing data, namely by presenting and analyzing data. Quantitative research is obtained through the analysis of test scores. Descriptive analysis is used to describe the learning media used while quantitative analysis is used to see the students' learning outcomes after the learning media is used.

1.   Questionnaire

According to Arikunto (2017) a questionnaire or questionnaire is a set of written statements or questions given to respondents to answer. The questionnaire to be used is arranged according to the Likert scale. This scale is used by researchers to measure the perceptions, attitudes or opinions of a person or group of people about social phenomena.

Table 1. Power Point Media Instruments Grid

Indicators	Sub Indicators	Question num
Material Suitability	a. The material presented in the power point media is in line with the topics that have been taught.	1
		2
	b. The material presented in the power point media is completely arranged.	3

Indicators	Sub Indicators	Question num
	c. Pictures presented in the power point media are in line with the learning topics being taught.	
Power point media display characteristics	a. the fonts displayed in the power point are clear.	4
	b. Images displayed in the power point can be seen clearly.	5
	c. The animation shown in the power point is interesting.	6
Procedures for using power point media	a. Power point media is used during online learning.	7
	b. Power point media is used to explain the material being taught.	8
Functions and benefits of using power point media	a. Learning material is easier to understand by using power point media,	9
	b. The use of power point media in learning can attract students' attention.	10

Table 2. Video Media Instruments Grid

Dimension	Indicators	Item num.
Clarity Of Massage	1. Make learning meaningful.	1
	2. Make learning easy to remember.	2
	3. Make learning easy to understand.	3
Stand Alone	Does not depend on other learning media	4
User Friendly	1. Easy to understand	5
	2. Material is appropriate	6
Content representation	Can explain learning material	7
Visualization with media	Contains animation and sound	8
Using high resolution quality	Use high resolution images.	9
Can be used individually and in groups	Can be used in individual learning.	10

2. Learning Outcomes Test

According to Sudjana (2009), tests are generally used to assess and measure student learning outcomes, especially cognitive learning outcomes, with regard to mastery of teaching materials in accordance with the educational and teaching objectives. Written tests in this study were used to obtain data about the understanding of the material taught. The test used was a multiple-choice test that is based on the existing curriculum at school and compiled by the researchers themselves. However, this study limits its focus on learning outcomes in the cognitive domain only.

3. Descriptive Data Analysis Techniques (Learning Media)

Table 3. Questionnaire Interpretation Criteria

No.	Percentage	Criteria
1.	0% - 20%	Very weak
2.	21% - 40%	Weak
3.	41% - 60%	Sufficient
4.	61% - 80%	Strong
5.	81% - 100 %	Very strong

Quantitative Data Analysis (Learning Outcomes Test) for Learning Outcome Validity Test with the Rasch Model Approach Using Winstep.

Arikunto (Prijowutanto, 2016) states that a test is said to be valid if the results match the criteria. This validity test uses the Rasch model, which was developed by Georg Rasch. According to Sumintono & Widhiarso (2013) the Rasch model is a model derived from Item Response Theory (IRT). Outfit means-square, z-standard, and point measure correlation are the criteria used to check the suitability of the items.

Table 4. Criteria Value of the Questions

No.	Criteria	Value
1.	*Outfit Means Square (MNSQ)*	0.5 < MNSQ < 1.5
2.	*Outfit z-Standard (ZTSD)*	-2.0 < ZTSD < + 2.0
3.	*Points Measure Correlation*	0.4 < PT Measure Corr < 0.85

4. Learning Outcome Reliability with the Rasch Model Approach Using Winstep

According to Consuello (Prijowutanto, 2016) reliability is the speed or accuracy of an evaluation tool. A test is said to be reliable if the test tool can be trusted, and is consistent or stable as well as productive. Instrument reliability testing in this study was calculated using the Rasch model. The researcher uses the standard item reliability value to see whether the test reliability fit the Rasch model. Sumintono & Widhiarso, (2013) states that in order to see the item reliability value, the Rasch model uses the following score criteria/categories.

Table 5. Cronbach's Alpha Value Criteria

No.	Alpha Cronbach Value	Category
1.	< 0,50	Bad
2.	0,50 – 0,60	Poor
3.	0,60 – 0,70	Okay
4.	0,70 – 0,80	Good
5.	>0,80	Very good

Table 6. Person and Item Reliability Value Criteria

No.	Person and Item Reliability Value	Category
1.	< 0,67	Poor
2.	0,67 – 0,80	Okay
3.	0,80 – 0,90	Good
4.	0,91 – 0,94	Very good
5.	>0,94	Excellent

RESULTS AND DISCUSSION
Results
1. Respondents' Responses for Each Indicator Analysis

Respondents' responses were obtained from students in three schools, namely SMA Negeri 1 Bongomeme, SMA Negeri 1 Dungaliyo and SMA Negeri 1 Tibawa in Gorontalo district. Researchers used as many as 20 statements relating to the use of power point media and film/video media. The following is a recapitulation of respondents' responses from three schools in the Gorontalo district.

Table 7. Respondents' Responses to the Power Point Media Indicator

No.	Score (Rating Scale)					Percentage
	5	4	3	2	1	
1.	52	216	12	1	2	**81.90**
2.	43	200	21	12	7	**79.08**
3.	45	209	25	4	0	**80.42**
4.	49	218	12	2	2	**81.20**
5.	42	200	28	12	1	**83.25**
6.	41	210	26	6	3	**80.21**
7.	52	203	23	3	2	**81.90**
8.	65	202	14	1	1	**79.08**
9.	51	202	17	8	5	**80.42**
10.	13	216	36	6	12	**74.98**
Mean score = 80.25						

Based on the results of table 1, there are ten statements related to power point learning media. From the table, it can be seen that the percentage obtained is 80.25%. The percentage of 80.25%, when viewed based on the interpretation criteria from Sugiyono (2011), is included under the strong criterion that is within the interval of 61% -80%.

Table 8. Respondents' Responses to the Video Media Indicators

No.	Score (Rating Scale)					Percentage
	5	4	3	2	1	
1.	20	165	69	16	13	**71.51**
2.	47	217	15	3	1	**81.41**
3.	41	212	24	4	2	**80.21**
4.	39	222	16	4	2	**80.63**
5.	52	212	17	0	2	**82.04**
6.	52	218	9	4	0	**82.47**
7.	42	216	20	4	1	**80.77**
8.	39	223	17	2	2	**80.84**
9.	26	236	15	4	2	**79.78**
10.	31	228	19	3	2	**80**
Mean score = 79.97						

Based on the results of Table 2, there are ten statements related to film/video media. From this table, it can be seen that the

percentage obtained is 79.97%. The percentage of 79.97, when viewed based on interpretation criteria according to Sugiyono (2011), is included in the strong criteria, which is within the interval of 61% -80%.

Table 9. Recapitulation of Respondents' Responses Based on Indicators

SMA N 1 BONGOMEME		
Indicators	Average Percentage	Criteria
Power Point	80.4	Strong
Video	79.97	Strong
SMA N 1 DUNGALIYO		
Power Point	80.72	Strong
Video	79.91	Strong
SMA N 1 TIBAWA		
Power Point	80.43	Strong
Video	80.07	Strong

Based on Table 9, it can be seen that SMA Negeri 1 Bongomeme gets a percentage of 80.4% for power point media indicator. This percentage is included under the strong criteria. In addition, the film/video media indicator gets a percentage of 79.97% which is also included within the strong criteria. As for the other schools, SMA N 1 Dungaliyo obtained a percentage of 80.72% (included within the strong criteria) for the power point media indicator, and 79.91% for the film/video media indicator (also included within the strong criteria).

Finally, SMA Negeri 1 Tibawa received a percentage of 80.43% under the strong criteria for power point media and 80.07%, also under the strong criteria, on the film/video media indicator.

2. Analysis of Learning Outcomes Data Using the Rasch Model with the Winstep Application

From the output results in the item measure table, it can be seen that the items in the table are sorted according to their level of difficulty, whereby the most difficult item is put at the top and the easiest is at the bottom. This is related to the total score column which states the number of the correct items. For example, for item number 6, the logit value was 0.53 and only 186 out of the 283 respondents answered it correctly. Next, item number 13 has a logit value of -0.41 and 232 out of the 283 respondents answered it correctly. This can be seen in the item column of the questions that have the most difficulty, namely item 6, and the easiest question, namely item 13.

Table 10. Item Measure Output on Winstep

Item	Total Score	Measure
6	186	0.53
8	203	0.22
5	204	0.20
3	207	0.15
9	209	0.11
1	211	0.07
11	211	0.07
4	213	0.03
12	213	0.03
14	220	-0.12
10	221	-0.14
15	221	-0.14
2	226	-0.26
7	229	-0.33
13	232	-0.41

Grouping the level of difficulty of the items is done using the value of the standard deviation (SD) combined with the average logit value. The standard deviation value in this test is 0.23.

Table 10. Question Grouping based on difficulty level

Logit value	Question number	Category
Greater than +0.23 SD	A6	Very difficult

Logit value	Question number	Category
0.0 logit +0.23 SD	A8, A5, A3, A9, A1, A11, A4 and A12	Difficult
0.0 logit - 0.23 SD\	A14, A10, A15 and A2	Moderate
Smaller than -0.23 SD	A7 and A13	Easy

3. Reliability Test Results

Based on the results of the data analysis obtained, the reliability value consists of 3 criteria, namely: (a) Person Reliability, to measure the consistency of the answers from the students; (b) Item Reliability, to measure the quality of the items based on the results of answers from respondents; and (c) Cronbach Alpha Reliability, to calculate the reliability of the instrument obtained as a whole. The following table shows the reliability values obtained.

Based on the data analysis using Winsteps software, there obtained the results of person and item instrument reliability. Item reliability obtained a value of 0.90 within the good category (the criteria for good is 0.80-0.90), while person reliability obtained a value of 0.70 within the sufficient category with the criteria of 0.67-0.80. Lastly, Cronbach's Alpha value is 0.77 within the good category with the criteria of 0.70-0.80. From this value, it can be concluded that the level of consistency of the students' answers is quite high, and that the questions on the instrument used has good reliability, namely 0.90. In addition, the Cronbach's Alpha value which shows the interaction between person and item as a whole is quite good, namely 0.77.

4. Analysis of Student Learning Outcomes at Each Cognitive Level
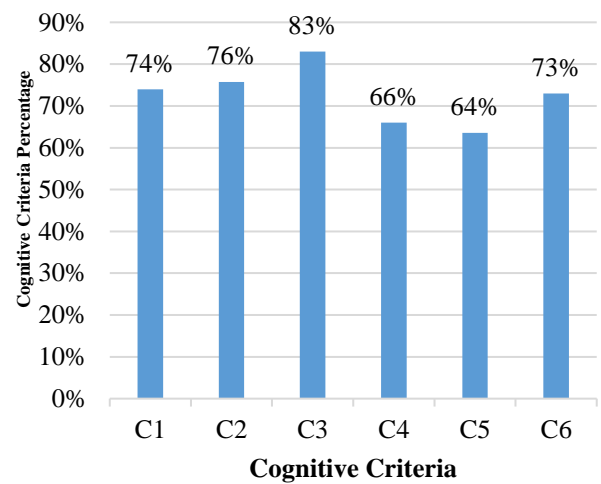
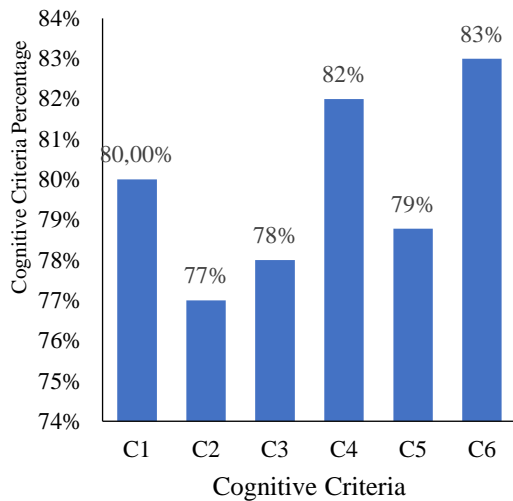**Figure 1.** Cognitive Criteria Analysis Diagram at SMA N 1 Bongomeme

Based on the results of the analysis in Figure 1, it can be seen that out of the whole cognitive criteria, (C1 to C6), C3 has the highest percentage value.
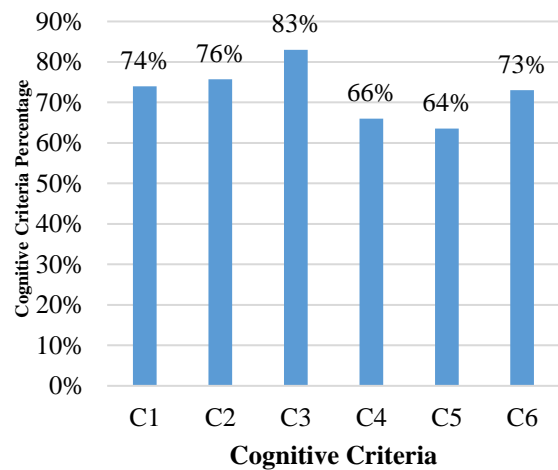
Figure 2. Cognitive Criteria Analysis Diagram at SMA N 1 Dungaliyo

Based on the results of the analysis in Figure 2, it can be seen that out of all cognitive criteria, (C1 to C6), C1 and C2 have relatively high percentage values, compared to other cognitive criteria.

Based on the results of the data analysis in Figure 3, it can be seen that out of the six cognitive criteria (C1 to C6), C6, C4 and C1 have a high percentage value compared to other cognitive values.

Figure 3. Cognitive Criteria Analysis Diagram at SMA N 1 Tibawa

The following table shows the average value of learning outcomes in each school:

Table 11. Learning Outcome Average Score

School	Learning Outcome Average Score	Criteria
SMAN 1 Bongomememe	77.52	Good
SMAN 1 Dungaliyo	79.18	Good
SMAN 1 Tibawa	80.91	Good

Based on the results of the analysis in table 11, the average value of student learning outcomes at SMA Negeri 1 Bongomeme was 77.52 under the good category. Meanwhile, the average value of student learning outcomes at SMA N 1 Dungaliyo was 79.18 under the good category. As for the average student learning outcomes at SMA N 1 Tibawa, it was 80.91 under the good category. Thus, the average value of student learning outcomes from each school obtained is higher than the KKM, which, in each school, was set at 75.

Discussions

The data from this study were obtained through questionnaires and learning outcome tests, with the number of statements in the questionnaire being 20 (twenty statements), the number of questions in the multiple-choice learning outcome tests being 15 (fifteen items/questions) and the number of respondents from the three schools of Gorontalo Regency being 283 students. This is done to see how the use of power point learning media and learning videos affect student learning outcomes.

In the learning process in the three schools in Gorontalo Regency (SMA N 1 Bongomeme, SMA N 1 Dungaliyo and SMA N 1 Tibawa), the teachers use power point learning media and learning videos when online learning takes place.

When online learning takes place, the teacher always uses learning media in the form of power points and learning videos. After learning is complete, students are then given a questionnaire that contains statements about how the use of power point and video learning media is during the learning. In addition, the students are also given evaluation questions in order to see their learning outcomes.

Based on Table 11, it can be seen that the students' learning outcome average scores in the three schools (i.e., SMA N 1 Bongomeme, SMA N 1 Dungaliyo and SMA N 1 Tibawa) after using power point learning media and learning videos are 77.52, 79.18, and 80.91 for SMA N 1 Bongomeme, SMA N 1 Dungaliyo and SMA N 1 Tibawa respectively. These results show a score that is above the KKM, which has been set at 75.

The results of this study are in line with the research of Fitri, Baharudin and Muhammad, which shows that the learning media used has an influence on learning outcomes or the learning process conducted.

CONCLUSION

Based on the results of the study, it can be concluded that the use of learning media in the schools are quite good, as evidenced by the average score for each questionnaire

indicator given to respondents, which obtained a fairly good score: 80.25% and 79.97% for power point learning media indicator and learning media indicator respectively. Based on the results obtained, the three schools obtain an average score above the KKM score (75). SMA Negeri 1 Bongomeme obtains 77.52%, SMA Negeri 1 Dungaliyo obtains 79.18% and SMA Negeri 1 Tibawa obtains 80.91%.

Based on the conclusions above, the researcher provides the following suggestions: The results of this study can be used as a basis for other scholars in conducting further research on the same problem, both at junior high school/equivalent level (SMP/MTs) or high school/equivalent level (SMA/SMK/MA).

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