

# Development of Google Sites Assisted Learning Media on Vibration, Waves and Sound Material

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**Abstract.** Students can master and understand the material properly requires a quality learning media or device. This study aims to determine the quality (valid, practical, and effective) of google sites-assisted learning media on vibration, wave and sound material. This research is a Research and Development (R&D) study using a 4-D model. Collecting data using observation, questionnaires and tests. Data analysis used descriptive qualitative analysis. The results showed that the developed Google Sites assisted learning media met the valid, practical and effective qualities. Based on the results obtained that google sites assisted learning media is feasible and can be used learning process.

## 1 Introduction

The development of technology-based science has now changed a necessity of life and human development rapidly. School is a place to protect education and participate in utilizing developing technology. The use of technology in today's digital era makes learning more fun and interesting and is able to improve the quality and quality of teaching and learning. Teachers are required to be able to equate technological developments with student development, in order to create close relationships between teachers and students. So that the teacher can provide better learning so that the material can be conveyed well to students. According to Suma, scientific literacy is needed to be able to keep up with the fast progress of science and technology, especially for the world of work [10].

Previously, the teacher was the only source of information for students, but now there are many things that students can use to obtain useful information, such as the environment, parents, professionals, books, the internet, and so on. The most influential source of information today is internet trends. Therefore, the Internet is very likely to become a learning resource and learning media that runs on the Web. According to Fitra, J., and Maksum, teachers today must be more open to the existence of modern technology that can be used as a means or media that can help the learning process in quality classrooms [3].

Learning using the website is learning that is suitable for learning related to distance or near. There are lots of pages and website features that can be utilized in the online learning process using the website, including the Google Sites page. The media website has quite a lot of sites and features so that they can be applied to distance teaching and learning

processes, namely by using or accessing websites based on Google sites. Google sites include web sites that can be used in the learning process [2]. Google Sites is part of Google which can be used as a website creation tool. Google sites have the advantage of being simple. Access the desired information quickly, because you can add attachments and other Google information, such as Google Docs, sheet, from, calendar, awesome tables, videos from youtube and others. In addition, the Google Sites Network is also easy for beginners to make because it can be accessed online, free of charge and does not use any programming language. The use of Google sites is also distance and time and can be used on various devices [11].

Based on the results of observations at SMP Negeri 3 Gorontalo, regarding the science learning process at school, learning is carried out offline. The method used in the learning process is not good enough because it is still teacher-centered, for example the lecture or demonstration method and the lack of use of media in the learning process which makes students not understand the science learning material presented and triggers student boredom with the learning process so that learning does not work effectively. For this reason, innovation is needed so that there is also student-centered learning both in terms of understanding concepts, learning media and subject matter that can be open to science and technology. This is in line with the statement from Montu & Abdul, that the science learning process which tends to seem procedural, monotonous, and less open will cause boredom, so that it has a negative impact on science learning outcomes themselves [6]. This study uses development research to assess the effectiveness of google sites-assisted learning media.

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This is in line with Nieven's statement, that the criteria for a good learning tool are about validity, practicality and effectiveness. Learning media must also be seen for its quality which includes valid, practical and effective. Media is something that is very important in learning, where it can make it easier for students to receive and understand lessons, can motivate students to be more active and active in learning and increase the addition of information related to material [12].

In connection with the explanation described above, the researcher is interested in the research paper "Development of Google Sites Assisted Learning Media of vibration, waves and sound material" The title is in bold Arial 16 points, justified. The first letter of the title must be capitalized and the rest lowercase. Leave 22 mm of space above the header and 6 mm of space after the header.

## 2 Research methods

This research is a development research with a research design using a design developed by Thiagarajan S, Semmel D. S, and Semmel MI (1974), namely a 4-D (Four-D) model design with several stages, namely: Defining (Define), Designing (Design), Development (Develop) and Dissemination (Disseminate). This research was conducted at SMP Negeri 3 Gorontalo for a limited trial with a total of 20 students/respondents and an expanded trial was carried out at Muhammadiyah Batudaa Middle School with a total of 40 students/respondents in the 2021/2022 academic year. This research is a study to see the quality of the media used in learning which includes valid, practical and effective.

The data analysis technique used in this study is a descriptive qualitative analysis that describes the developed valid, practical and effective learning environments. The validity of learning media is measured by learning media validity tables and learning achievement tests, which are evaluated based on the feedback and comments of expert validators. The practicality of media learning is measured by observing learning and the implementation of student responses. The effectiveness of media learning is measured by learning activities and learning outcomes (THB) observation boards.

## 3 Results

### 3.1 Validity Results

The comes about of the approval arrange by specialists in this consider are within the frame of validation/assessment of the possibility of the coming about google locales media. The appraisal was carried out by inquiring for suppositions and recommendations from the teachers of the Office of Material science, State College of Gorontalo, by filling out each instrument on the approval sheet. Validation/assessment of the achievability of learning media by the validator by looking at angles of the

appraisal counting: development, substance, lucidness, dialect and appearance. Based on this perspective of the appraisal, the comes about of learning media validation are appeared within the taking after table.

**Table 1.** Learning Media Validation Results

Validators	Average per Validator	Average Overall Validator	Criteria
Validators 1	3,3	3,4	Valid
Validators 2	3,6		Valid

Table 1 shows that the average percentage is 3.4 with a valid category ( $2.6 \leq P \leq 3.5$ ), where Google sites-assisted media can be implemented with some revisions.<

Learning Results Test (THB) approval is carried out by a validator by looking at angles which incorporate development, substance, lucidness and dialect. Taking after are the comes about of the taking after appraisal.

**Table 2.** Results of Learning Outcomes Test Validation (THB)

Validators	Average per Validator	Average Overall Validator	Kriteia
Validators 1	3,4	3,5	Valid
Validators 2	3,6		Valid

From the assessment of the results of the validator, it can be seen that Google Sites assisted media is included in the usable category with a slight revision, namely 3.5. This can be seen in table 2. However, seeing this research, it will be seen its effectiveness, so this research also validates THB.

### 3.2 Practical Results

The common sense of the media is seen through an investigation of the usage of learning and understudy reactions to media helped by Google Locales. The taking after information was gotten at the trial organize:

#### 3.2.1 Results of Implementation of Learning

The usage perception sheet is utilized to degree the usage or non-implementation of arranged learning exercises within the lesson plans. Based on the comes about of observations of 3 gatherings withinthe restricted trial, specifically withi n the taking after table:

**Table 3.** Percentage of Implementation of Limited Trial Learning

Meeting	Percentage (%)	Criteria
1	80%	Good
2	80%	Good
3	84%	Good
<b>Average</b>	<b>81%</b>	<b>Good</b>

The data above shows the percentage of learning implementation during 3 meetings in a limited trial so that it is in a good category. This can be seen from the average percentage obtained, which is 81%. The results of this analysis show that the learning process in the limited trial was carried out well.

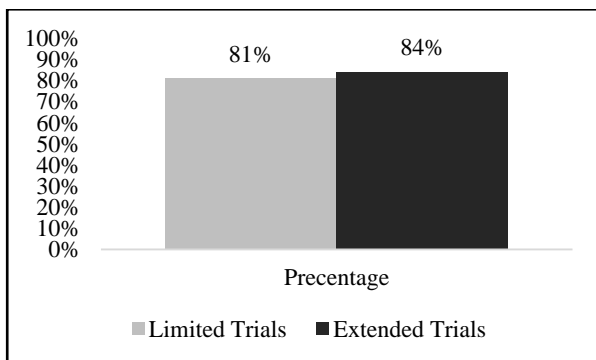
Then the results of the implementation of learning media in the trial expanded to 3 meetings, namely as follows:

**Table 4.**Percentage of Extensive Trial Learning Implementation

Class	Meeting	Percentage (%)	Average Percentage (%)	Criteria
A	1	84%	85%	Good
	2	84%		
	3	88%		
B	1	80%	84%	Good
	2	84%		
	3	88%		
<b>Average</b>			<b>84%</b>	<b>Good</b>

Based on table 4 it can be seen that the average percentage of learning implementation is in the "Good" category. It can be seen that the results for class VIII A were 85%, then for class VIII B it was 84%, so the average percentage obtained was 84%. The results of this analysis show that the learning process in the extended trial was carried out well.

The following is the difference in the percentage score of implementation data results in the two trials:



**Fig 1.** Percentage of Limited Trial and Wide Trial Implementation Results

Based on the graph shown in figure 1, the percentage achievement score of the two results the learning implementation trial as shown in the graph shows an increase from the score of 81% in the limited trial to an increase of 84% in the extended limited trial.

### 3.2.2 Questionnaire Results Student responses

Analysis of student responses to google sites-assisted media consisted of two statements referring to positive and negative statements. There are 4 indicators with a total of 20 statements. Student responses given after the end of the lesson were proposed as a reference for assessing the level of student interest in its application in class. Giving a score for each statement using a Likert scale and the results of the response data. The following data obtained can be seen in the table below.

**Table 5.** Percentage of Student Response Limited Trial

Indicator	Category (%)			
	STS	TS	S	SS
Opinions of students using google sites-assisted learning media in face-to-face learning	1.8	14.1	62.3	21.8
The effectiveness of the use of google sites-assisted learning media	0.0	11.0	57.0	32.0
Learning outcomes of students who have used google sites-assisted media	3.8	13.8	55.0	32.5
Average Percentage (%)	79%			

The results of the questionnaire analysis on google sites assisted media at 3 meetings for the limited trial obtained a percentage (79%). It can be concluded that there is a good response to google sites assisted media.

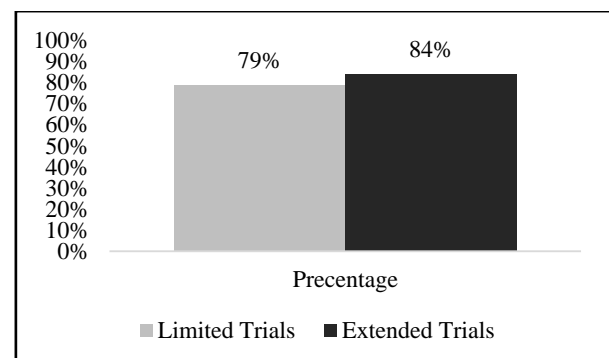
The results of the analysis of student responses in the widest trial which was tested on 40 students divided into 2 classes are shown in the following table:

**Table 6.** The Percentage of Student Responses in the Widespread Trial

Indicator	Category (%)			
	STS	TS	S	SS
Opinions of students using google sites-assisted learning media in face-to-face learning	0.2	6.6	53.6	39.5
The effectiveness of the use of google sites-assisted learning media	0.0	5.0	50.0	45.0
Student learning outcomes after participating in learning using learning media assisted by Google sites	0.0	4.4	52.5	42.5
Average Percentage (%)	84%			

Based on the data that the percentage value of learning media is (84%), this states that the learning process using google sites-assisted learning media is able to motivate and encourage students to master the concept of the material.

The difference in percentage scores from the results of student response data to the widest google sites-assisted media can be seen in the following figure:



**Fig 2.** Percentage of Student Response Questionnaire Results for Limited Trials and Extensive Trials

Based on the graphs shown in Figure 2, it can be shown that students have responded well to the google sites-assisted learning media that have been developed. After conducting the yaki tryout from the limited tryout to the extended tryout with a range (79% -84%) it can be seen that there is an increase in student responses so that it can be categorized as "Good". This shows that google sites assisted learning media obtains a positive response from students, which means that google sites assisted learning media is practically applied to the learning process.

### 3.3 Effectiveness Results

In this study, the effectiveness of learning media was assessed using two measures :

#### 3.3.1 Results of Student Activity Analysis

Student activity data was conducted by observers in three sessions, and the following data were obtained:

**Table 7.** Percentage of Student Activity Trial is limited

Meeting	Percentage of Student Activity (%)	Criteria
1	81%	Good
2	83%	Good
3	85%	Good
Average	83%	Good

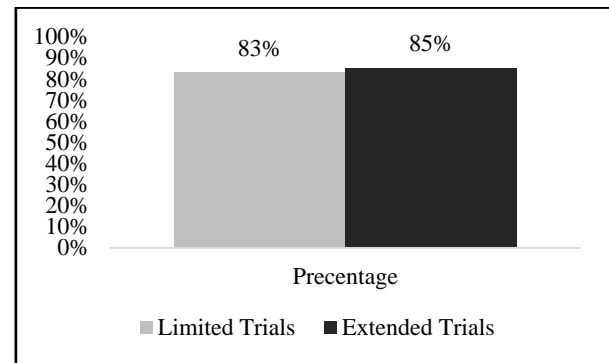
Based on the data obtained in a limited trial that was carried out at SMP Negeri 3 Gorontalo, the percentage of students' activity obtained results of 83%, these results were included in the "Good" criteria. Furthermore, an expanded trial was carried out to see the difference in the percentages of the two trials.

**Table 8.** Percentage of Student Activity Expands Trial

Class	Meeting	Percentage of Student Activity (%)	Average Percentage (%)	Criteria
A	1	83%	85%	Good
	2	84%		
	3	88%		
B	1	83%	84.6%	Good
	2	84%		
	3	87%		
<b>Average</b>			<b>85%</b>	<b>Good</b>

The percentage score of student activity at SMP Muhammadiyah Batudaa is included in the good criteria because it has an average value of 85%. Based on these criteria, it can be concluded that media assisted by Google Sites is effective for application.

The following is the difference in the percentage scores on the results of student activity data in the two trials:



**Fig 3.** Percentage of student activities that lead to limited and broad endeavors

An analysis of student activity data can be seen in the chart above. We have seen an increase in extensive trials of student activities conducted at SMP Muhammadiyah Batudaa. As such, the medium is practical with the help of his Google Sites to assist students in their learning process. Study.

#### 3.3.2 Results of Learning Outcomes Test Analysis

The test is structured based on the question indicators that are adjusted to the learning indicators. The level of the test given consists of cognitive levels C2-C5. In limited trials and widespread trials. The following presents the Ngain test data obtained:

**Table 9.** N-Gain Student Learning Outcomes Test Limited Trial

%Pretest	%Posttest	N-Gain	Information
25.5	69,1	0.60	Currently

Based on table 9, the limited trial shows that the N-gain at SMP Negeri 3 Gorontalo is 0.60. Next, the researcher will look at the differences from the extensive trials:

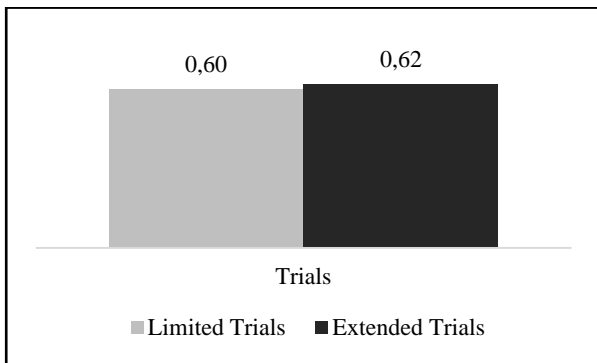
**Table 10.** N-Gain Student Learning Outcomes Test Widespread Trials

Class	%Pretest	%Posttest	N-Gain	Information
VIII A	26,1	71.4	0.62	Currently
VIII B	27	71,2	0.62	Currently

Based on table 10, the achievement of H-Gain at SMP Muhammadiyah Batudaa is 0.60, it can be seen that the two classes get the same results. With an increase in the widespread trial with a moderate category, the researcher also concluded that the Google sites-assisted learning media developed was very effective.

The following is the difference in the percentage scores of N-Gain learning outcomes in the two trials:





**Fig 4.** Limited Trial and Expanded Trial N-Gain Value

Based on Figure 4, from the two trials that have been carried out and the results analyzed according to the graphs listed, it can be seen that there has been an increase in the students' N-Gain scores towards the widespread trials.

## 4 Discussion

Developing the media in this study, researchers used research and development (R&D) with 4D models. Media development in this study was conducted to test the quality of learning media, media with valid, practical and effective criteria exist. First, validation or evaluation should be performed by experts to obtain suggestions, comments, and expert opinions on the learning media (Draft I), and after revision (Revision 1), Draft II should result. The limited trial phase was implemented at SMP Negeri 3 Gorontalo which involved 20 grade VIII students in 3 meetings. Furthermore, after the limited trial revision 2 was carried out on the learning media, then the media was used for widespread trials. In widespread trials, the research was conducted at Muhamadiyah Batudaa Middle School involving 40 students in class VIII-A and class VIII-B in three meetings. Furthermore, researchers analyzed learning media that obtained results from trial data and produced final learning tools.

### 4.1 Validity

The media developed in this study are considered valid based on verifier/expert assessments conducted by two UNG physics lecturers using the Learning Media Validation Sheet tool. The validated aspects are content construction, readability, language and appearance. From the results of the validation of 2 experts, it was shown that the Google Sites assisted learning media developed could be used with a little revision. The revision aims to make learning tools relevant to trials and can be used in the learning process at school. In line with Chairunnisa et al., that the validation results with a little revision are feasible and can be applied to the teaching and learning process [9].

Learning media assisted by Google sites is an innovation that can be used in the learning process because its use can be done remotely or nearby. There are also advantages of using Google Sites, namely that in addition to being able to be used by ordinary users,

they can also store information in one web page. According to Mukti, WM, & Anggraeni, that there are several advantages of using google sites in learning because information such as presentations, text, attachments, videos and other information can be combined as needed. In line with Shabrina, states that Google sites used in learning are an innovation, especially in the field of physics because their use is interactive and can increase students' learning desires [7, 12].

### 4.2 Practicality

The usefulness of the learning media is based on observations of learning on the learning media supported by the Google website and conducting student response surveys. A learning medium can be said to be practical if students respond positively when using the developed medium. The usefulness of the media can be seen from the implementation and response questionnaire analyses. In a limited study, 81% of learning outcomes were achieved and categorized as 'good', expanding the study by 84%. These results demonstrate that Google Sites-supported learning implementations are practical to use in the learning process. According to Dhanan Abimanto and Wasi Sumarsono, learning implementation using Google website achieves his 80% implementation score, which falls into the "good" category [1].

Feasibility is also demonstrated by a student response questionnaire consisting of 3 indicators with 20 positive and negative opinions. Each statement was rated using a Likert scale [13]. As a result of the questionnaire analysis of the students' answers, we reached the average value (79%) in the limited trial and (84%) in the extended trial, and we were able to classify them as "good." This means that the learning media supported by Google Sites has a positive response from students and that the learning media supported by Google Sites are practical and easy to apply to the learning process. From the results of Wahyu Hidayatillah et al. The research conducted shows that research based on the practicality test of learning media on the Google website can be applied in practice in schools using student assessment questionnaires. Student survey responses fell within the good category (77% to 79%), indicating that students were able to easily use the developed Google Sites media [14].

### 4.3 Effectiveness

The effectiveness of learning media can be obtained through observing student activities and learning achievement tests (THB) that are carried out. The effectiveness of learning media is measured based on the achievement of objectives according to certain criteria, then the learning completeness of students according to expectations and the set KKM is a determinant of the effectiveness of a learning tool. Student activity is one of the determinants of the effectiveness of a learning media as measured using student activity sheets filled out by observers during the learning process. Based on the results of the

analysis of the percentage of student activity, the average score was obtained in the limited test (83%), while the trial expanded (84%) so that it was in the "Good" category. Based on the acquisition of these percentages, the use of google sites assisted media developed in the learning process is effective for use. This is in line with  $\geq$  Lantern M. Deyva, that the use of google sites learning media can increase student learning activities with the results obtained after using google sites media by (86.4%) with very good activity criteria [5].

Furthermore, student learning outcomes are one of the parameters to measure the effectiveness of the developed media. According to Mustaming, Ahmad, that student learning outcomes and student activity in the learning process are indicators used to measure the effectiveness of the learning tools used [8].

The students' learning results are obtained from the completed pre- and post-test. The purpose of the pre-test of the learning process is to find out the students' initial skills in terms of concepts/materials, while the purpose of the post-test is to see if an increase in the students' learning results can be noticed. after several learning processes. . Based on the test results, the learning results of students in the limited experiments were N-Gain (0.60), while in the extended experiment N-Gain (0.62) was included under the "average" N-Gain criterion because it was the range of N-Gain ( $0.7 > 0.3$ ). Based on the results obtained in limited experiments and large-scale experiments, the learning results have increased, in which it can be said that the auxiliary learning environment developed by the model of learning-guided inquiry of google sites are effective in use and have an impact. on learning outcomes or aspects. of student information. From the research results  $\geq$  I Ketut Maardia that the use of google sites learning environments affects the results of students' understanding of the material, where the learning results increase by 10.5, which suggests that the learning results increase the use of google -site-media[4].

## 5 Conclusion

Based on the research that has been carried out, it can be concluded that the development of google sites-assisted learning media on vibration, waves and sound material has valid, practical and effective qualities in terms of increasing the ability of student learning outcomes, implementation of learning, and student activities and obtaining positive responses from students regarding the learning media used. This research only discusses one chapter of science material, so it needs to be developed further in the science material chapter or other subjects.

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