

## Implementation of E-Learning Media Assisted by Google Sites in Increasing Studeants' Scientific Literacy Capability

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### Abstak

Tujuan penelitian ini adalah untuk mengetahui bagaimana *e-learning* berbantuan Google Sites dapat diimplementasikan dengan menggunakan pendekatan pengembangan ADDIE. Penelitian ini dilaksanakan di SMA N 1 Petanahan dengan jumlah siswa 5 orang untuk uji coba terbatas dan 34 orang untuk uji coba luas. Hasil penelitian menunjukkan bahwa: 1) Media pembelajaran *e-learning* berbantuan Google Sites dinilai valid berdasarkan hasil validasi ahli materi dan ahli media. 2) Skor angket respon siswa sebesar 98%, hasil observasi aktivitas sebesar 97%, dan hasil implementasi modul ajar sebesar 98% termasuk dalam kategori praktis. 3) Hasil uji t berpasangan menunjukkan keefektifan media; nilai t sebesar 0,00 berarti  $H_0$  ditolak dan  $H_1$  diterima, yang menunjukkan bahwa penggunaan media *e-learning* berbantuan Google Sites telah meningkatkan kemampuan literasi sains siswa.

**Kata Kunci:** Media Pembelajaran, Google Sites, Kemampuan Literasi Sains

### Abstract

*The goal of this study was to ascertain how Google Sites-assisted e-learning might be implemented using the ADDIE development approach. It was carried out at SMA N 1 Petanahan with 5 students for restricted trials and 34 students for extended trials. The study's findings demonstrated that: 1) the Google Sites-assisted e-learning media were deemed legitimate based on the validation results from material experts and media experts. 2) A student response questionnaire score of 98%, activity observation findings of 97%, and training module implementation results of 98% are included in the practical category. 3) The trial's paired t-test findings demonstrated the media effectiveness: the t-value of 0.00 means that  $H_0$  was rejected and  $H_1$  was accepted, indicating that the employment of Google Sites-assisted e-learning media had improved students' scientific literacy abilities.*

**Keywords:** Learning Media, Google Sites, Science Literacy Skills



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## INTRODUCTION

Education is very important and deserves everyone, with education it can provide the skills needed to adapt to the rapid changes of the times (Astuti et al., 2021). Education certainly cannot be separated from the name curriculum, the role of the curriculum in education the achievement of the goals of education. The curriculum becomes the overall center of the educational process and even the curriculum is a very important requirement because it is an inseparable part of education (Saihu, 2019). The curriculum currently used in the world of education is an independent curriculum, where the independent curriculum has a learning principle that is centered on students or can be called independent learning (Cholilah et al., 2023). The technology-based independent curriculum implements literacy development. There are six basic literacies of mastery developed in the independent curriculum (Huda et al., 2022).

This study examines the science literacy skills of students, where science literacy can be interpreted as scientific knowledge that has the aim of being able to identify several questions, gain new knowledge, explain phenomena scientifically, and be able to draw conclusions based on facts, and have the ability to engage and care about issues related to science (Rahmawati et

al., 2020). This is in line with science learning, namely physics, science learning in physics is a learning that is considered difficult so that there needs to be a direct role of the teacher in the learning process (Hardiyanti et al., 2018). One of the courses included in the autonomous curriculum is physics. One of the physics chapter materials taught in SMA class XI even semester is the heat chapter material. The heat chapter material is one of the contextual materials where students will be encouraged to find the relationship of the material studied with the situation in the surrounding environment and the phenomena that occur (Syafitri et al., 2019; Wulandari, 2018). Learners will be trained to collect data, understand an issue, and find solutions to a problem. Heat material is one of the physics topics that is quite complicated for students to understand, this is because it has many concepts that need to be understood, but has a big role in solving problems across branches of science (Astuti, 2019; Mardiana et al., 2022). Learners are able to understand material with moderate to high difficulty levels, including being able to describe heat changes that occur in real life, and analyze the effects of heat and heat transfer.

Some information was obtained based on the results of observations and conversations with physics instructors that the researcher conducted at SMA Negeri 1 Petanahan during the PLP process, because the teaching materials used in the learning process include worksheets and physics textbooks with a teacher-centered learning paradigm, which causes students to tend to be passive in learning activities, including the capacity of science literacy is still relatively poor, and students lack contextual understanding of the material, Furthermore, digital learning with the use of technology that is applied has not been fully maximized with various arguments and obstacle that exist, and besides that the system for delivering materials and assignments is sent via the class WhatsApp group and Google Classroom but files that have been downloaded will witch to the WPS Office application so that they can fill the storage space on students' cellphones, this is in line with research conducted (Wahyuni et al., 2023) that digital learning implemented at SMA Negeri 1 Petanahan is still less effective.

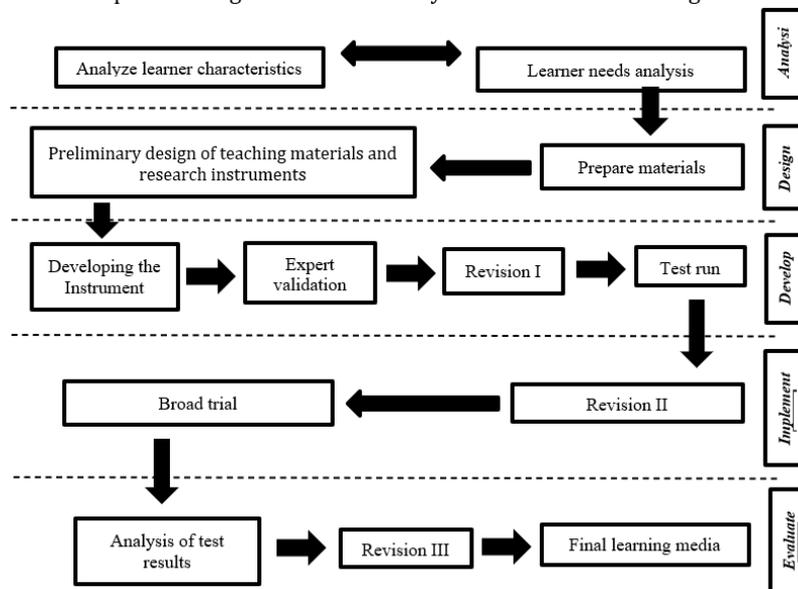
With these problems, in order to pique students' interest in studying, teachers must provide them with interactive learning resources that aid in understanding the subject matter. One of which is by using google sites. Google Sites is really simple to use, and it offers a variety of features that may be optimized to enhance the educational experience (Yoriska, 2021). This Google Sites can be accessed via laptop, cellphone, and also tablet phones (Nurliswati & Nurlizawati, 2022). His Google Sites media is free media of charge, the use of this media can be accessed anywhere and anytime as long as the user has a Google account and a link from Google Sites (Mukti, 2020). In addition, Google Sites make it very easy and can shorten the time during learning because differennt learning resources can be created and combined in one learning media using Google Sites (Waluyo, 2021). Google Sites that are arranged attractively with content that is relevant to the phenomena of students' lives and the use of Google Sites in physics material will be presented with simulations, which are equipped with LKPD, are anticipated to serve as a tool for motivating pupils to engage in active learning. With reference to the problem's background description, the researcher investigated how to improve students' science literacy through the creation of e-learning material supported by Google sites.

## **RESEARCH METHODS**

This research produces e-learning assisted by Google site in improving the science literacy skills of students by optimizing product with the ADDIE development model (Prihastanti et al., 2021). The manner in which it wa done designing a quasi-experiment with a non-equivalent control group. The control group received regular treatment, where as the experimental group received e-learning (Sugiyono, 2023, p. 120).

## Research Design and Procedures

In this research the ADDIE model is employed in a quasi-experimental design, and a limited trial of 5 students was taken on June 21, 2024 and while a broad trial of 34 students was carried out on June 24, 2024 at SMA N 1 Petanahan. The following is an image of the ADDIE model development design used in this study which can be seen in Figure 1.



**Figure 1. Development Procedure**

## Population and Sample

During the 2024-2025 school year, a total of 34 and 27 students from SMA N 1 Petanahan class XI 2A and 2B served as the research subjects, the selection of this class was based on physics subjects in class XI which were only taught in that class. The subjects of the limited trial were taken 5 students and the broad trial consisted of 34 students. Class XI 2A was treated by using e-learning for class 2B was treated with learning as usual.

## Data Collection and Instrument

Techniques for gathering data include validation, questionnaire, and observation. Two specialists in media and materials carried out the validation. The questionnaire used includes a science literacy sheet, response questionnaire, activity observation from students. Observation is done with the implementation of teaching modules and science literacy skills of students during learning.

## Data Analysis

Validity was analyzed using material validity, media validity and validity of science literacy skills. The validity scoring guidelines use a Likert Scale and Guttman Scale with criteria Yes=1 and No=0 (Sidik & Kartika, 2020) and are declared valid if  $V \geq 0.40$  and if not valid  $V < 0.40$  (Fauzizah et al., 2023). Practicality data analysis is obtained from student responses, activity observations, and implementation of teaching modules which are declared practical if  $NP > 60\%$  and are said to be impractical if  $NP < 60\%$  (Nabila et al., 2021). Effectiveness based on pre-post scores of science literacy skills which were then analyzed by paired sample t-test with condition that the research data must be normally distributed. To determine whether the data is normal or not, the Kolmogorov-smirnov test is performed using SPSS software and the significance level is determined.

## RESEARCH RESULTS AND DISCUSSION

Finding the applicable product's validity is the aim of validation. The media validation findings shown in Table 1, and the material validity results are shown in Table 2.

**Table 1. Results of Media Instrument Validation of Google Sites-assisted E-learning**

Item No	Expert 1	Expert 2	S1	S2	S	V
1	4	4	3	3	6	1,00
2	4	4	3	3	6	1,00
3	3	4	2	3	5	0,83
4	3	4	2	3	5	0,83
5	4	4	3	3	6	1,00
6	4	4	3	3	6	1,00
7	3	4	2	3	5	0,83
8	3	4	2	3	5	0,83
9	3	4	2	3	5	0,83
<b>Average</b>						<b>0,91</b>
<b>Category</b>						<b>Valid</b>

Based on the validation results, which produced an average of 0.91, the interpretation of the Aiken V index is placed in the valid category.

**Table 2. Results of Material Instrument Validation Against E-learning assisted by Google Sites**

Item No	Expert 1	Expert 2	S1	S2	S	V
1	4	4	3	3	6	1,00
2	3	4	2	3	5	0,83
3	3	4	2	3	5	0,83
4	4	4	3	3	6	1,00
5	3	4	2	3	5	0,83
6	4	4	3	3	6	1,00
7	4	4	3	3	6	1,00
<b>Average</b>						<b>0,93</b>
<b>Category</b>						<b>Vaid</b>

The interpretation of the Aiken V index falls within the valid category, with an average of 0.93 derived from the validation process. The application stage findings are intended to ascertain how well students' replies and science literacy abilities have improved through e-learning with the help of Google Sites. The results of the broad trial data obtained from the pre and post questionnaire results of science literacy skills, teaching module implementation, activity observations and learner responses.

**Table 3. Data on Learner Response Results**

No	aspect	Score Obtained	Maximum Score	Percentage
1	View	65	68	96%
2	Content	99	102	97%
3	Language	66	68	97%
4	User-friendliness	34	34	100%
<b>Average</b>		<b>66</b>	<b>68</b>	<b>98%</b>
<b>Category</b>				<b>Practical</b>

Aspects of the learner response assessed in Table 3 show the average value obtained of 98%  $\geq$  60% so that e-learning learning media assisted by Google Sites is practically used in learning based on the interpretation of practicality.

**Table 4. Data on Observation Results of Learner Activites**

No	Assessed Aspect	Observer		Average Score	Percentage
		1	2		
1	Virtual activities	2	2	1	100%
2	Oral activities	3	2	0,83	83%
3	Writing activities	1	1	1	100%
4	Listening activities	1	1	1	100%
5	Motor activities	2	2	1	100%
<b>Average</b>				<b>0,97</b>	<b>97%</b>
<b>Category</b>				<b>Practical</b>	

Aspects of th observation of learner activity assessed in Table 4 show the average value obtained of  $97\% \geq 60\%$  so that the e-learning learning media assistd by Google sites is practically used in learning based on the interpretation of practicality.

**Table 5. Data on Teaching Module Implementation Results**

No	Assessment Aspect	Observer		Average Score	Percentage
		1	2		
1	Perkenalan	4	4	1	100%
2	Inti	8	9	0,94	94%
3	Penutupan	3	3	1	100%
<b>Average</b>				<b>0,98</b>	<b>98%</b>
<b>Category</b>				<b>Practical</b>	

Aspects of the implementation of the teaching module assessed in Table 5 show the average value obtained of  $98\% \geq 60\%$  so that the e-learning learning media assisted by google sites is practically used in learning based on the interpretation of practicality. The efficacy of Google Sites-assisted e-learning by calculating the degree of significant value using paired sample t-tests of pre- and post-questionnaire data on students' science literacy skills If the two-tailed significance value (Sig.) is less than 0.05 with a confidence level of 5%, H1 is regarded as approved, whereas H0 is rejected. This suggests that students' pre- and post-science literacy scores differ from one another. An interpretation of the matched sample test findings is provided in Table 6.

	<i>Paired Differences</i>					<i>T</i>	<i>Df</i>	<i>Sig. (2-tailed)</i>
	<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>	<i>95% Confidence Interval of the Difference</i>				
				<i>Lower</i>	<i>Upper</i>			
Pretest-Posttest	28.529	12.403	2.2127	24.202	32.857	13.412	33	.000

The findings of the paired sample test are displayed in Table 6 with a mean value of 28.529. There is a difference of 24,202 to 32,857 between the results of the pre- and post-questionnaires regarding students' science literacy abilities. For the standard deviation, the value obtained is 12.403 with a standard error mean of 2.2127 and a df value of 33 with a positive t value of 13.412, These findings show that the average post value is higher than the pre value, and the test's significance level was 0.00, which is less than 0.05, indicating that H0 is rejected and H1 is acceptable.

The results of e-learning development products assisted by google sites can be seen on the website <https://sites.google.com/view/materikalorkelas11/home>.

## Discussion

From the validity test by material experts with 7 aspects of the instrument, the Aiken V value is 0.93 so that it can be said to be valid. This aspect is reviewed from the content of the material and language. The results of the assessment of the material experts in this study indicate that the heat material used in e-learning learning media assisted by Google sites can meet the achievements and learning objectives. The validity test by media experts found that e-learning is suitable for use by getting an Aiken V value of 0.91 so that it can be said to be valid. This is because the e-learning assisted by google sites that has been developed meets the assessment aspects of the ease of use aspect with indicators that are assessed for ease of accessing the media, ease of operation and systematic presentation of material, design and display aspects assessed from background design, layout and suitability of menu icons and readability aspects assessed from font size, image clarity and color combination and composition.

From the results of the practicality test, the results of the implementation of the teaching module were obtained with an average score of 98% so that it can be said to be practical, that it is said to be practical if the practicality value is  $> 60\%$  which refers to the criteria for practicality according to (Nabila et al., 2021) with aspects reviewed from the learning process including introduction, core, closing. The results of the practicality test of students' responses obtained an average score of 98% of all aspects included in the practical category with the criteria for practicality meeting the criteria  $> 60\%$ . The results of the practicality test of activity observations from students in the broad trial obtained an overall average of 97% of aspects included in the practical category, which refers to the criteria for practicality  $> 60\%$  so that it is said to be practical. The results of the effectiveness test were obtained from the pretest and posttest assessment activities of the students' science literacy questionnaire with the pre average value lower than the post average value, namely compared to the post results,  $H_0$  can be rejected and  $H_1$  can be accepted if the matched sample test findings, namely  $55.44 < 83.97$ , have a significance level of  $.000 < 0.05$ .

## CONCLUSION

Based on the research conducted, it can be concluded that the e-learning learning media aided by Google Sites developed meets the criteria for media feasibility, which includes valid, practical, and effective. Additionally, students' literacy skills can improve through the use of e-learning learning media aided by Google Sites.

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