

Website-Based Learning Media Using Google Sites to Improve Student Learning Outcomes in Natural and Social Sciences Subjects on Biodiversity Material

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Abstract: Inappropriate use of learning media in learning process activities can cause uninteresting learning. This study aims to develop website-based learning media using Google Sites in the Natural and social sciences subject biodiversity material in grade V elementary school. The research method used is Research and Development with the ADDIE development model. The subjects in this study were media experts, material, teachers, and 21 fifth-grade elementary school students. Data collection is used in the form of test techniques and non-test techniques. The test techniques used are pretest and posttest, while non-test techniques include observation, interviews, questionnaires, and documentation. In the data analysis process, the normality test, t-test, and N-Gain test methods were used, which were carried out with SPSS 23 software. The results of the study presented a validation test by media experts getting a score of 91%, while the validation test by material experts got a score of 92%, with a very feasible category. The t-test results on the small group trial presented a sig. (2-tailed) of 0.008. while in the large group trial, the t-test presents a sig value (2-tailed) of 0.000. The results of the N-Gain Test in the small group and large group trials showed an increase in value of 0.60 and 0.55 which was in the medium category. This shows an average increase between pretest and posttest scores. From these results, it is concluded that website-based learning media using Google Sites is very feasible and effective in improving student learning outcomes related to the biodiversity material in grade V elementary school.

Keywords: Google Sites; Learning Outcomes; Natural and Social Sciences

Introduction

Education is an effort to improve the quality of human life by cultivating higher moral, social, cultural, and religious ideals. Humans can improve the quality and potential that exists in themselves through education (Saputra et al., 2022). Education is a deliberate and structured endeavor, that is carried out by individuals because they are given the responsibility to shape students to have traits and characters that are by educational goals (Imawan & Ismail, 2023). The advancement of science and technology has a very important impact on education today. Technology is used as an aid in learning. used as an aid in learning. It is expected that technology will play a role in making it easier for teachers to become more proficient in the

teaching process (Rohman & Susilo, 2019; Winter et al., 2021). Teachers must take advantage of technology. The presence of this technology makes the educational process more interactive, creative, and fun (Ahmed & Opoku, 2022). To facilitate the delivery of teaching and learning activities, educators must apply their creativity in utilizing learning media.

Along with the development of technology, educators can design more efficient and interesting learning media for students, and motivate students' active participation in the learning process (David & Weinstein, 2024; Zamiri & Esmaeili, 2024). With today's technological advances, educators can create more efficient and interesting learning media for students, as well as increase student activeness in the learning process (Haryanto, 2022). Teachers must encourage and

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motivate their students because they have an important role in learning activities that take place in the classroom. Teachers are challenged to be innovative and creative in learning because of several things such as dense material, limited learning time, and lack of media. Media can be defined as tools or resources used to channel messages or lesson content, stimulate students' thoughts, feelings, and abilities, and support the learning process guided by the teacher.

One important element in education that must follow technological developments in the learning process is learning media (Salsabila & Aslam, 2022). Learning media is a means that makes it easier for educators to present understanding to students, support the smooth implementation of learning, and achieve learning objectives. The role of media in the learning process is very important to ensure the material delivered by teachers can be received quickly and effectively by students (Tarno et al., 2023). The purpose of the media is to assist in describing learning including the delivery of clearer material, the use of learning time more efficiently, and making the teaching and learning process more interesting and varied.

However, before applying learning media, teachers need to consider first the subjects to be taught, teachers must also adjust educational media relevant to the instructional content must also be considered, especially subjects Natural and Social Sciences, because they teach about social interaction and relationships in everyday life. Natural and Social Sciences is one of the subjects that must be taught in elementary school. Primary school students need to learn Natural and social sciences so that they can use learning resources to help them get to know the activities of society and their environment (Widyastuti & Airlanda, 2021). With the right media, the learning obtained by students will be obtained optimally (Yanto et al., 2023). Website-based learning media is a great alternative to be used when learning. Websites can provide benefits for internet users and are used as learning resources (Suartini et al., 2022; Dwi-Wicaksono et al., 2023).

The use of websites as teaching tools provides an opportunity for educators to continue to follow technological developments and innovate in making learning more interesting for students (Haleem et al., 2022). Until now, educators only use learning media that are available but have never developed technology-assisted learning media. By utilizing website-based learning media, students can continue to learn anywhere. This continuous learning allows learners to improve their learning outcomes (Firmansyah et al., 2023). Website-based learning media that uses Google Sites is one of the innovations in learning media that can provide interesting and easy-to-use teaching by educators (Lestari & Safitri, 2023).

Google Sites is a product developed by Google as a website creation tool. With Google Sites, users can effectively gather a variety of content in one place including text, videos, attachments, and more, which can then be shared as needed. Utilization of Google Sites who have a Google account can use Google Sites, and there is no additional cost. With an internet-connected device or laptop, students can easily access Google Sites. To access the links and documents provided by the teacher, students simply open them using the website browser already installed on their phones. This makes Google Sites an easy tool for students to use. Therefore, Google Sites is a great tool for researchers who want to test the effectiveness of learning and give students the impression that science and social studies subjects are as fun as any other subject. Science and social subjects in the merdeka curriculum use project-based learning to incorporate Pancasila values. These subjects blend the concepts of social science and science. to understand natural and social phenomena.

The results of interviews that have been conducted by researchers with grade V teachers of public elementary school Wates 02 Semarang city, In the learning process he has not used and does not know the learning media using websites using Google sites, in Natural and social sciences learning teachers still use media such as textbooks and sometimes use PowerPoint. Natural and Social Sciences is also a lesson content that requires high understanding and reading interest to be able to master the material, while their learning resources are only limited to printed books and LKS, as well as the use of learning media that is still limited, due to limited learning resources and learning media in Natural and Social Sciences learning content, it affects the learning outcomes of students. Lack of use of learning media in learning activities can cause learning to become monotonous and uninteresting. A large number of students still consider Natural and social sciences learning as a boring lesson and make students bored. also contributes to learning challenges because it will affect the low level of interest and can result in a lack of motivation to learn and it also affects student learning outcomes.

One of the efforts that can be made to overcome problems in science learning should use tools, namely learning media, one of the learning media that can overcome the above difficulties is website media-based learning using Google Sites (Dwivedi et al., 2023; Ideland, 2021). Google Sites is a website created specifically to create a website that can be used as a learning medium for educators. Creating a website with Google Sites is also easier because the process is not too complicated and does not require coding. Google Sites can be easily created and maintained by users without extensive technical knowledge, hence it is highly recommended that users take advantage of it (Waluyo,

2021). Research that is relevant to this problem is a study entitled "The Use of Google Sites Fractional Materials to Improve the Activities and Numeracy Abilities of Elementary School Students". The results of the study showed an increase in student learning outcomes by using website-based learning media using Google Sites. This is evidenced by the results of the validity analysis which obtained a percentage of validity reaching 82.9%, showing a very high level of practicality of 90.6%, and the effectiveness seen from the increase in the average pretest score of students from 67.81 to 84.69 at the posttest stage. The observation of the results also illustrates observations indicate a 53.70% increase in student engagement following the use of Google Sites as a learning medium. Given the learning outcomes achievement rate of 81.25%, it can be concluded that website-based learning media utilizing Google Sites is highly effective feasible, and effective for the learning process.

The difference between the research and the research that will be carried out by researchers is about the material discussed, the place of research, and the development model. The material discussed by the researcher was biodiversity in the content of science lessons with the place of implementation at public elementary school 02 Semarang city. Based on the problems that have been found, researchers are interested in developing website-based learning media using Google sites in class V Natural and Social Sciences subjects, biodiversity material at public elementary school Wates 02 Semarang city. By developing website-based learning media using Google sites in class V Natural and Social Sciences subjects biodiversity material at public elementary school Wates 02 Semarang city, researchers want to make this website-based learning used to attract students' attention and also make students more active in learning carried out to improve Shiva's learning outcomes in Natural and Social Sciences subjects. In addition, to test the feasibility and effectiveness of the media that has been developed.

Method

This research uses a type of development research, namely research and Development (R & D) with the ADDIE development model. Research and Development is a method used to create new products and products that meet specific requirements. The research and development method can be explained as a scientific process that involves researching, designing, producing, and testing the resulting products (Reed et al., 2021). Researchers will conduct research at the public elementary school Wates 02 Semarang city by carrying out 5 stages, namely Analysis, Planning, Development, Implementation, and Evaluation (Pratomo & Shofwan, 2022). This development model was chosen because the

ADDIE development model is more detail and easy for researchers to understand. Here is a picture of the 5 stages of R&D research steps with the ADDIE approach method.

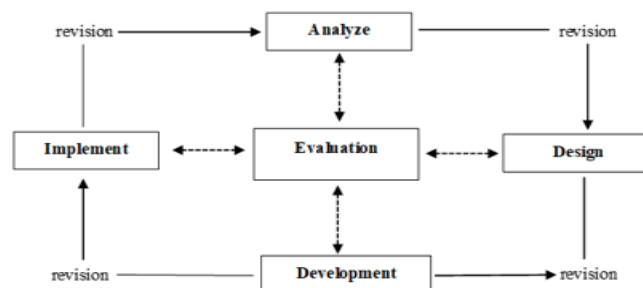


Figure 1. ADDIE model development stage

The analysis is the activity of analyzing the assessment of work situations and the environment to ensure products that require development. Planning is a Product activity that is by needs. Development is the activity of production and product testing. Implementation is an activity using products and Evaluation is this activity evaluating whether the products that have been produced and every step of the activity are by specifications. The subjects of this study were grade V students of public elementary school Wates 02 Semarang city totaling 27 children, which included 13 boys and 14 girls. By conducting small group tests for 6 students and large group tests for 21 students. Data collection is carried out with test techniques and non-test techniques.

The test technique is carried out using a pretest and posttest which aims to assess student learning outcomes in learning Natural and social sciences. And non-test techniques are carried out through interviews, questionnaire dissemination, and documentation. After that, data analysis techniques used to determine the effectiveness of website-based learning media using Google Sites are carried out through normality tests, T-Test, and N-Gain tests determined from student pretest and posttest results. Then to review the feasibility of the learning media used which is assessed by media expert validation, material expert validation, teacher responses, and student responses.

Results and Discussion

Result

In this study, researchers developed a learning website using Google Sites. This research uses the type of Research and Development (R&D) research with products developed in the form of learning websites. This development model uses the ADDIE model, with stages of Analysis, Design, Development, Implementation, and Evaluation. This study explains the results of the design of website-based learning media

development using Google Sites, the feasibility of website-based learning media using Google Sites, and the effectiveness of website-based learning media using Google Sites. The following is the process of developing website-based learning media using Google Sites class V elementary school biodiversity material.

Analysis

The activities carried out by researchers at this stage are to observe and identify problems regarding student characteristics, learning models, learning support facilities, learning resources, and learning media applied in the learning process. Based on data that has been collected through interviews with teachers and the distribution of questionnaires to teachers and students, it was found that students showed less enthusiasm for engagement in learning. This results from the implementation of educational media that is less varied by teachers. The school is equipped with adequate facilities to meet the needs of students to support the learning process, such as an internet connection and LCD projector. However, teachers have not been able to utilize these facilities optimally.

In the learning process, teachers still tend to use conventional methods, namely delivering material using tools such as PowerPoint or without the use of learning media. This condition hurts student learning outcomes because low enthusiasm makes it difficult for them to understand the subject matter. Based on the initial data that has been collected regarding the learning process and student needs, the development of interactive learning media is essential to overcome problems that arise in learning activities. Furthermore, researchers conducted an analysis of material adapted to the curriculum used in learning activities tailored to learning outcomes.

Design

In this stage, researchers design the learning media to be used. Researchers designed the concept of website-based learning media using Google Sites and made storyboards that were adjusted to the results of the analysis of student and teacher needs, as well as competencies in class V natural and social sciences learning with the biodiversity material. Using the website Canva, researchers sketched images and navigation buttons. In addition, at the end of Google Sites-based learning media, researchers also make learning videos, interactive quizzes, and practice questions to facilitate students' comprehension of the material covered.

Development

At the development stage, researchers develop website-based learning media using Google Sites. The development of learning media must be in line with the

curriculum applied at SD Negeri Wates 02 Semarang city for class V natural and social sciences subjects, especially in the biodiversity material. The following are the results of developing website-based learning media using Google Sites.



Figure 2. Cover



Figure 3. Home



Figure 4. Material



Figure 5. Distribution map



Figure 9. Display of evaluation questions



Figure 6. Material benefits of diversity

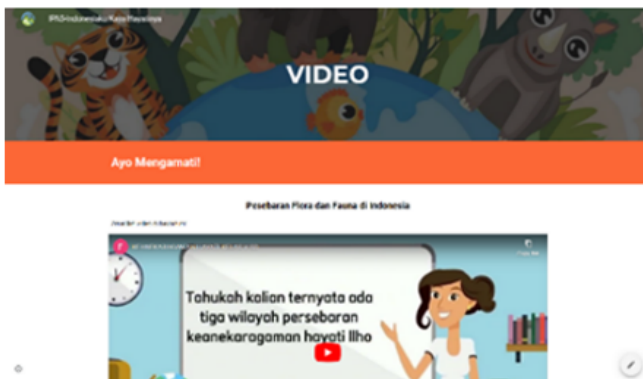


Figure 7. Learning videos



Figure 8. Quiz View

Implementation

At the implementation stage, researchers conduct small-group trials and large-group trials. Before conducting trials on small groups and large groups, researchers validated website-based learning media using Google Sites. This validation is assessed by experts in media and content experts through the distribution of questionnaires. Media experts will test the validity of website-based learning using Google Sites, while material experts will test the validity of biodiversity material in grade V elementary school natural and social sciences subjects. The results of the assessment from the two experts to improve website-based learning media using Google Sites before being tested. Then after obtaining assessments from media experts and material experts through questionnaires, researchers carried out pretest and posttest on two groups of students. The small group consists of 6 students, while the large group consists of 21 students.

A pretest is carried out before the use of website-based learning media using Google Sites, and then during the learning process, students are provided with web-based learning materials utilizing Google Sites. which is then continued by carrying out a posttest. Various tests, including the normality test, paired samples test, and N-Gain test, are used as part of the data analysis procedure after the pretest and posttest are administered to small and large groups. In conducting normality test research using SPSS 23. The results of the small group normality test showed a sig value of 0.212 on the post-test and 0.847 on the pretest. Meanwhile, the results of the large group normality test showed a sig value of 0.079 on the posttest and 0.123 on the pretest. Here is a table of the Paired Samples Test and N-Gain in small groups and large groups.

From the table 1, the paired samples test results in small groups show the influence of the application of website-based learning media using Google Sites, with a sig (2-tailed) value of 0.008. Thus, it can be concluded that H_0 was rejected and H_a was accepted.

Table 1. Paired Samples Test in Small Groups

		Mean		Std. Error MeanStd. Deviation		95% Confidence interval of the difference		Paired sample test Paired differences	
				Lower	Upper	t	df		
Pair 1	Pretest-posttest	-34.16	-19.60	8	-54.73	13.59	4.27	5	.008

Table 2. Paired Samples Test in Large Groups

		Mean		Std. Error MeanStd. Deviation		95% Confidence interval of the difference		Paired sample test Paired differences	
				Lower	Upper	t	df		
Pair 1	Pretest-posttest	-24.28	11.86	2.58	-29.68	18.88	9.38	2	.000

From the table 2, the paired samples test results in large groups show the influence of using website-based learning media using Google Sites, with a sig (2-tailed) value of 0.000. That way, it can be inferred that there is

an impact from the implementation of website-based learning media using Google Sites. So, Ho is rejected and Ha is accepted. Then the N-Gain test table in small groups and large groups as follows.

Table 3. N-Gain Test in Small Group

	Pretest Score	Posttest score	Posttest score-pretest score	N-Gain score	N-Gain score %	Criteria
Mean	46.66	80.83	34.17	0.60	60	Medium

It can be concluded from the N-Gain Test table in the small group, that the data shows that there is an average increase with moderate criteria from the pretest

and post-test data, which is displayed with a value of 0.60.

Table 4. N-Gain Test in Large Groups

	Pretest Score	Posttest score	Posttest score-pretest score	N-Gain score	N-Gain score %	Criteria
Mean	54.76	80.95	26.19	0.55	55 %	Medium

It can be concluded from the N-Gain Test table in the large group, that the data shows that there is an average increase with moderate criteria from the pretest and posttest data, which is displayed with a value of 0.55. It was concluded that the average learning outcomes of students on the pretest and post-test had increased, according to the results of the N-Gain test analysis on the small group and large group t-tests.

experts in media, experts in material, teacher feedback, and student feedback are used to improve website-based learning media using Google Sites that have been developed. The table below shows the results of assessments that have been carried out by experts, teacher responses, and student responses related to learning media.

Evaluation

In this study, the results of the process of developing website-based learning media using Google Sites. In this section, researchers analyze the results of products that have been developed to assess whether the media meets the expected standards or not. The data obtained at this stage is data obtained from assessments from media experts, material experts, teacher responses, and student responses. Assessment of the validity of website-based learning media products using Google Sites is handled by media experts, material experts, and assessments by class teachers. Assessment by students about website-based learning media using Google Sites is carried out through trials in small groups and trials in large groups. The assessment outcomes provided by

Table 5. Product Validity Test

Test Subjects	Percentage (%)	Category
Media expert test	90.60	Very worth it
Materi expert Test	91.70	Very worth it
Small group triall	83	Very worth it
Large group triall	88.50	Very worth it
Class teacher test	98.30	Very worth it

Based on the product validity test table, results from media experts showed a figure of 90.6%, which is categorized as highly feasible. The assessment from material experts showed a result of 91.7%, and the teacher's response was 98.3%. Small group trials obtained 83% results, while large group trials showed 88.5% results. Based on the results of assessments by experts and students, website-based learning media using Google Sites is considered very feasible.

Suggestions from media experts include adding the university logo and the Merdeka Campus logo, as well as clarifying and enlarging navigation buttons. Then suggestions from material experts so that the questions given to students are in the form of questions with a high cognitive level.

Discussion

Based on the findings of the conducted research, researchers have successfully developed website-based learning media using Google Sites biodiversity material for natural and social sciences subjects in grade V elementary schools (Id Babou et al., 2023; Ramadannisa & Hartina, 2021). The outcomes of the validation test evaluation by experts, teacher responses, and student responses show that this learning media is highly suitable for utilization (Noviana et al., 2023; Sirait et al., 2023). The validation test by media experts resulted in a score of 90.60 % in the very decent category. The use of website-based learning media using interesting Google sites has the potential to arouse the interest in learning owned by students to reduce their level of saturation in the learning process (Henderson et al., 2019; Sosa Díaz, 2021; Gupta & Garg, 2021). Therefore, in the development of learning media, high renewal and creativity are needed (Hidayati et al., 2024). While the validation testing conducted by subject matter experts gets a score of 91.70% with a very decent category.

The material is not only limited to text but can also be in the form of images and videos so that learning becomes more varied and interesting (Grassini, 2023; Abdulrahman et al., 2020; Lange & Costley, 2020). Assessment by teachers obtained a score of 98.30%, student responses from small group trials obtained a score of 83% and large group trials received a score of 88.50%. Then the results of the t-test using paired samples test in small group trials showed a sig value (2-tailed) of 0.008, while in a large group, the sig value (2-tailed) was 0.000. From the results of the t-test and N-Gain test conducted in small-group trials and large-group trials, it can be inferred that there are significant differences in student learning outcomes before using media and after using website-based learning media using Google sites in natural and social sciences biodiversity material for grade V Elementary School.

In line with other studies that state that website-based learning media using Google Sites meet media eligibility criteria, namely valid, practical, and effective, it is suitable to be applied in the context of science and social learning. The use of Google Sites in Natural and social sciences learning is very useful in presenting website-based material that can attract students' attention during the learning process (Fraisl et al., 2022; Schindler et al., 2017). Google Sites is a platform specifically designed to create websites, one of whose functions is to assist educators in creating website-based

learning media (Szymkowiak et al., 2021). Google Sites is a structured wiki application that allows users to create websites or blogs, both for personal and corporate purposes (Schindler et al., 2017). Google Sites Teachers can do various things, such as providing learning materials, questions, assignments, syllabi, and variations of learning materials. The presence of Google Sites as a learning medium is expected to increase the interest of students in following the learning process at the elementary school level (Pubian & Herpratiwi, 2022).

Google Sites offers several interesting advantages to learn, which are different from the use of other sites or websites. First, Google Sites is free and easy to design. Second, Google Sites facilitates user collaboration while using it. Third, there is 100 MB of free internet storage. Fourth, this site can be searched using the Google search engine. Fifth, the appearance of Google Sites can automatically adapt to the devices used including mobile phones, laptops, and tablets. This will not consume much memory or internet quota because students are no longer required to download content provided by the teacher. In addition, teachers can make the appearance of Google Sites as attractive as possible so that students do not feel bored (Sagita et al., 2023). Features such as animated videos, Student Worksheets (LKPD), educational games, and quizzes add variety to learning and strengthen students' understanding of the concepts taught (Pulungan et al., 2022).

The limitations of this study are First, Google Sites does not have drag-and-drop facilities provided for designing website pages, so users have to make manual adjustments. Because Google Sites does not support scripts and iframes, users need to find a specific gadget to be able to use it. Third, this media can only be used if connected to the internet. Suggestions for the next researcher are some materials that need to be added, including using language that is easy to understand, improving the visual design to make it more interesting, providing simulations and interactive quizzes that are more completed and interesting, and adding more diverse learning resources (Javaid et al., 2023).

Conclusion

This research produces website-based learning media using Google Sites for Natural and Social Sciences subjects with the biodiversity material for grade V Elementary School. This media allows students to interact directly and be more active in the learning process through interactive quizzes provided. In addition, this website-based learning media using Google Sites has an attractive appearance with a variety of colors, images, videos, sounds, and animations, thus making learning activities more interesting and reducing student boredom. Based on the results of the research and discussion above, it can be concluded that

the research on the development of web-based learning media using Google Sites is effective and feasible to use to improve student learning outcomes in Science and Social subjects in grade V elementary school.

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Authors' Contributions

Our role F. N. J. N., T. A in writing this scientific article, F. N. J. N. as the first author made observations at the school that became the research location to identify problems in the learning process. Furthermore, F. N. J. N., proposed a website-based learning media using Google Sites as a solution to the problems found. Then process the research data and write the article. The supervisor T. A contributes by providing suggestions and ideas for research instruments, as well as guiding, directing, and evaluating the author during the writing process.

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Conflict of interest

The authors in this study declare that there is no conflict of interest in any form.

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