

Development of Web-Based Learning Media Using *Google Sites* to Improve Learning Outcomes of IPAS

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Abstract: This research aims to develop a website-based learning media using *Google Sites* so that it can improve student learning outcomes in science learning grade V elementary school. This development research is carried out according to the ADDIE model. Data collection techniques through interviews, observations, questionnaires, and tests. The data analysis technique uses qualitative and quantitative descriptive and inferential analysis techniques. At the media implementation stage, two trials were carried out, namely a small-scale trial with 5 students and a large-scale trial with 15 students. The result of this research is that the media that has been developed is classified as a very feasible qualification from media experts and material experts. The results of the t-test showed a significant increase in the results of the pre-test and post-test. The results of the N-Gain test showed an increase in the moderate category. Thus, it can be concluded that web-based learning media using *Google sites* that have been developed can be one of the solutions to improve student learning outcomes

Keywords: *Google sites*; IPAS learning outcomes; Learning Media

Introduction

The use of technology in the implementation of learning can provide significant support for the implementation of the independent curriculum (Widiyono et al., 2021). The use of technology in learning can create a learning environment that is more dynamic, and interesting, and the development of students (Akbar et al., 2019). Integrating of technology in learning is changing how teachers teach and students learn (Mailana et al., 2023). One of the learning elements that is closely related to the use of technology is learning media.

Learning media is a tool used to help the learning process achieve learning goals better (Magdalena, I., et al., 2021). Law No. 20 of 2003 article 1 paragraph 20 explains that learning media is a component that supports the success of the teaching and learning process. Learning media can improve the quality of learning (Afifa et al., 2024) by helping educators deliver learning materials that are innovative, creative,

comprehensive, attract students' enthusiasm, and create fun learning situations (Hamid et al., 2020:8). Learning media can stimulate the mind, as well as the ability and attention of the student in the learning process (Kumala et al, 2020).

From observation and interview activities at SD Negeri 2 Babadan, the results showed that there were several problems in the implementation of science and technology learning in class V. Students did not play an active role in learning because learning was centered on the teacher who was in control during the learning process or often referred to as *Teacher Centered Learning*. In this learning, students play a role in listening to what is conveyed by the teacher, especially the method used in learning the lecture and demonstration method which results in students getting bored, sleepy, chatting with friends, or playing alone. In addition, teachers who are not familiar with the use of learning media that are interesting, interactive, fun, and able to increase students' enthusiasm in participating in the learning process. This occurs due to the lack of facilities and infrastructure that can support learning activities and

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the lack of teacher skills in using various learning media, especially technology-based media. Skills in using technology are competencies that a teacher must possess and master (Purnasari et al., 2021:3090). This condition requires teachers to be able to use and develop interesting, creative, and innovative learning media, of course, by utilizing technology (Maryani et al., 2022).

Based on the description of the problem above, it is necessary to develop learning media that is more interesting, interactive, easy to use, and packaged into something new for students by utilizing technology (Alika, O et al., 2021). Web-based learning media can be one of the innovations for the problems that occur in the learning process (Hakim et al., 2023). This website-based learning media has many platforms, one of which is *Google Sites*. *Google Sites* is one of the many products of *Google* as a site builder (Jubaidah et al., 2020). *Google Sites* can be used to combine multiple pieces of information in one container and can be shared as needed by users (Mardini et al., 2020; Rikani et al., 2021; Ismawati, I, et al., 2021). *These Google sites* can be accessed anywhere and anytime and are practical and simple (Hidayat et al., 2023). Students only need to open the *links* and documents provided by the teacher through a *web browser* that is already available on smartphones so students do not need to use a special application to open them (Ismawati, I, et al., 2021). Learning materials and related information can be provided and collected through *Google Sites* so that no student is left behind (Azis, 2019:313). Thus, *Google Sites* are expected to be able to help students and also educators (teachers) in implementing learning that is more interesting, simple, and interactive.

The implementation of IPAS learning requires the use of interesting and interactive learning media, because the structure and concept of IPAS are abstract, so the use of learning media is expected to be able to change it to be more real or concrete, simple and practical. This is proven in one of the studies conducted by Aurelia F.P et al in 2023. The results of the research carried out were verification from media experts, with an average percentage value of 96.6% classified as very effective, and material expert verification of 98% with a very efficient category. The students' responses to this website-based learning media obtained a result of 93% which was classified as very good, and the teacher's response received a percentage score of 94% which was classified as very good this learning media showed the result of student learning completeness of 85% in the complete category.

Based on the background that has been described, the researcher will conduct research entitled "Development of Website-Based Learning Media Using *Google Sites* to Improve Learning Outcomes of IPAS Class V SD Negeri 2 Babadan Banjarnegara"

Method

Research methods are a scientific way to obtain data with a specific purpose (Sugiyono, 2017). In addition, research methods include theoretical analysis of a method or method. The type of research used by researchers is the *Research and Development (R&D)* method. The development procedure that will be used in this study is the ADDIE (*Analysis, Design, Development, Implementation, and Evaluation*) development model.

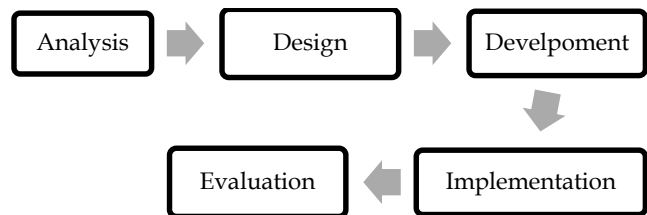


Figure 1. ADDIE Model

The ADDIE model in designing instructional systems uses a systems approach. The systems approach divides the learning planning process into several steps in a logical sequence and then use the *output* of each step as input to the next step (Januszewski et al., 2008).

The data collection technique in this study is through observation, interviews, questionnaires, and tests. Researchers made observations to be able to witness and observe directly in identifying problems that occurred at SD Negeri 2 Babadan Banjarnegara. Interviews were conducted to find out the problems that existed in class V either during the learning process or problems related to the success of the learning process. Then a questionnaire to find out the assessment of media experts and material experts on the learning media that has been developed by the researcher. Then the questionnaire of teacher and student responses was used to measure effectiveness, as well as to determine the impact of the use of learning media that the researcher had developed. The instruments used in this study consist of media expert validation sheets, and material expert validation sheets. Written tests are conducted before and after the use of the media/product of this study. This aims to determine the level of effectiveness of the media that has been developed

The data analysis technique in this study uses three techniques, namely; 1) Qualitative descriptive analysis, used to describe, illustrate, and disclose facts comprehensively using criticism and input. (Wicaksana et al., 2020). 2) Quantitative descriptive analysis, is the process of processing data that has been obtained in the form of numbers or percentages (Agung, 2014., Sulityawati, N.L et al 2022). 3) Inferential statistical

analysis (t-test), this technique is carried out by applying inferential statistical formulas to test a hypothesis in a study (Agung, 2014; Sulistyawati et al, 2022).

Result and Discussion

The result of this development research is a website-based learning media using *google sites* which aims to improve student learning outcomes in the science class V subject. This development research was carried out in the 2023/2024 Academic Year even semester (February-June 2024) using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model. This model uses a systematic approach to design and develop training or learning products. This model has five main stages that are interrelated. The first stage is Analysis. Based on the analysis of the needs for learning media development that has been carried out by the researcher, the results obtained are that teachers and students expect interesting, interactive learning media that can increase the active participation of students which of course can improve student learning outcomes. Previously, the media used in the learning process was still less varied such as *PowerPoint* which was less interactive, pictures, and concrete media that were less attractive to students. In addition to needs analysis, curriculum analysis is also carried out to determine learning objectives based on Learning Outcomes according to the curriculum used. Then compile and identify the concepts used systematically to find out the students' understanding of the learning outcomes and learning objectives that have been prepared in the form of teaching modules.

After conducting the analysis, the second stage is *design* determining the media and initial design. The media that will be developed by the researcher is a learning media *Google Sites*. At this stage, the researcher determines the concept of media starting from *Background*, themes, layouts, material content, colors, and font shapes that the researcher designed with the help of the Canva application to make it easier to create media designs for *Google Sites*. The third stage is Development, which is the process of making learning media according to what has been designed in the previous stage. The results of the learning media can be accessed through the following link: <https://sites.google.com/students.unnes.ac.id/daerah-ku-kebanggaanku-kelas-v/menu-utama>.



Picture 1. Main Menu



Picture 2. Material Menu

After the media has been developed, validation tests are carried out by media experts and material experts. The results of the validation test from media experts obtained a result of 89.3% with a very feasible category while the results of the validation test from material experts obtained a result of 90% which was categorized as very feasible. It can be concluded that this Google Sites learning media is suitable for use in the learning process.

The fourth stage in this study is implementation. At this stage, the application of products in class V science learning at SD Negeri 2 Babadan was carried out on the material of my pride in my region. The application or trial of the product is carried out in two stages, namely a small-scale trial with 5 students and a large-scale trial with 15 students. In this test, pre-test and post-test scores are also taken to find out if there are changes or differences in scores after and before the use of learning media. The results of the data obtained are then processed to find out whether the distribution of data is normal or not. The results of the normality test are presented in Table 1.

Table 1. Normality Test

	Sig.	Category
Small scale pre-test	0.2	Normal
Small scale post-test	0.16	Normal
Large scale pre-test	0.2	Normal
Large scale post-test	0.2	Normal

Based on the results of the normality test of the pre-test and post-test data, it can be known that the data is normally distributed. This can be seen from the significant value (sig) in the Kolmogorov-Smirnov

column getting a > sig value of 0.05 so that the data can be said to be normal. Then, a t-test was carried out to find out if there was an average difference between the two groups. The results of the t-test are presented as Table 2.

Table 2. Paired sample t-test

	Sig.(2-tailed)	Category
Small scale	0.009	Significant
Large scale	0.000	Significant

The results of the t-test showed significance values on the small scale of 0.009 and 0.000 on the small scale. The results show that the use of products on a small scale and a large scale has increased learning outcomes (pre-test and post-test) as evidenced by the significance value of the two groups <0.05. After the t-test, an N-Gain test was then carried out to measure or determine the improvement of learning outcomes before and after the use of Google Sites learning media. The results of the N-Gain test are presented as Table 3.

Table 3. N-Gain Test

	Average pre-test	Average post-test	N-Gain
Small-scale	62.0	80.0	0.47
Large-scale	58.67	84.0	0.55

From the results of the N-Gain test, the N-Gain result was 0.47 where < 0.7 which means that the improvement of learning outcomes on a small scale is in the medium category. Meanwhile, the N-Gain value on a large scale is 0.556 which is also in the medium category, where the N-Gain value < 0.7. The fifth stage in this study is evaluation. After the use of *Google Sites media*, students and teachers provide feedback as evaluation material on the development of this media, the evaluation is carried out with the aim that *Google Sites media* can be improved or developed by suggestions or feedback from students and teachers so that the quality and effectiveness of the media can be improved.

Discussion

This Google Sites learning media was developed based on ADDIE (*Analysis, Design, Development, Implementation, Evaluation*) research and development procedures. The ADDIE model has steps or stages that suit the needs and characteristics of students (Sulistyawati, NL, et al, 2022). The results of the data analysis that have been carried out show that Google Sites learning media is stated as a valid learning media, suitable for use in the learning process, and able to improve student learning outcomes.

The feasibility level of the Google Sites learning media that has been developed is measured from the

validity results carried out by 2 media experts and materials using validation sheets on a scale of 1 to 4. Based on calculations using the Likert scale, the percentage of media validation is 89.3% while the percentage of material validation is 90%. Thus, the Google Sites learning media that has been developed is classified as valid or very feasible to use. The validity or the level of validity is measured from the accuracy of the interpretation of the measurement results (Sahidu, 2016; Sevita, AF et al, 2022).

In addition to the level of feasibility, the effectiveness of Google Site learning media can be seen from the results of the N-Gain test which aims to determine the improvement of student learning outcomes through pre-test and post-test. The average *pre-test* and *post-test* scores in small-scale trials were 62.0 and 80.0 and resulted in an N-Gain value of 0.47 which was included in the medium category. Then the average *pre-test* and *post-test* values in large-scale trials were 58.67 and 84.0 and produced an N-Gain value of 0.556 which was included in the medium category.

Based on these results, it can be concluded that Google Sites learning media is effective in improving student learning outcomes. This can happen because students are more interested in participating in learning with this *Google Sites media*. This is in line with research conducted by Wulandari, and Zuhroh (2023) students are more enthusiastic about learning using Google Sites media because they are accompanied by attractive images, and simple language, and there are learning videos and are equipped with evaluation questions. *Google Sites media* also brings a new atmosphere to learning (Rijal & Jaya, 2020). Able to create fun learning, so that students will more easily understand the material being studied (Salsabila & Aslam, 2022). The use of interactive Google Sites media can increase students' interest in learning (Shabrina, 2019)

Conclusion

Based on the results and discussion, it can be concluded that the Google Sites learning media developed based on the stages of the ADDIE model, the level of media validity obtained results of 89.3% for media experts and 90% from material experts with a very valid category. The level of media effectiveness was obtained from the calculation of learning outcomes through pre-test and post-test calculated using the N-Gain test and obtained a result of 47% for small scales with the effective category and 55.6% for large scales with the effective category. Suggestions for future researchers who will develop website-based media using *Google Sites* are: (1) In media development, maximize the use of interesting animations or images.

(2) The shape of the letters can be developed again to make it more attractive.

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Author Contributions

In completing the research, U contributed to writing, collecting, screening, and analyzing the research data, while B reviewed and corrected the article. All authors have read and approved the published manuscript

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Conflicts of Interest

The authors declare no conflict of interest

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