Google Sites Media with High Validity and Student Engagement in Learning: Media Google Sites dengan Validitas Tinggi dan Keterlibatan Siswa dalam Pembelajaran

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General Background: The rapid development of information and communication technology has transformed various sectors, including education. **Specific Background:** Despite this advancement, elementary education in Indonesia still heavily relies on conventional methods, as observed at SDN 27 Tapian Kandis where teachers primarily use printed materials. **Knowledge Gap:** Teachers face limitations in utilizing digital learning platforms due to a lack of understanding and training. **Aims:** This study aims to develop and evaluate a Google Sites-based learning medium on ecosystem material to enhance fifth-grade students' interest in learning. **Results:** The media demonstrated high validity (92.95%), practicality (96%), and effectiveness (84.82%). The N-Gain score (0.8483) and student interest response (95%) indicate significant improvement in engagement and learning outcomes. **Novelty:** The developed Google Sites media integrates diverse features such as instructional videos, LKPD, quizzes, and teacher profiles—allowing for interactive, accessible, and visually rich content without requiring programming skills. **Implications:** This innovation proves that Google Sites can serve as an effective, practical, and scalable digital solution for enhancing student engagement and modernizing instructional practices in elementary education.

Highlight :

- The study developed Google Sites-based media shown to be highly valid, practical, and effective in increasing 5th graders' learning interest.

- It used the ADDIE development model to systematically analyze, design, implement, and evaluate digital learning tools.

- Google Sites enabled interactive, multimedia-rich content tailored to Gen Z students, promoting motivation and digital literacy.

Keywords : Learning Media, Google Sites, Student Engagement, Elementary Education, Digital Innovation

INTRODUCTION

The use of digital technology at the Elementary School (SD) level in Indonesia still faces various obstacles, especially in terms of infrastructure and optimal use in the learning process. Based on data from the Ministry of Education, Culture, Research and Technology through the Center for Data and Information Technology (Pusdatin), only around 27.2% of elementary schools in Indonesia have computer laboratories, which shows that more than 70% of elementary schools do not yet

have basic technology facilities to support digital-based learning. In addition, although around 45.6% of elementary schools have internet access, its use is still predominantly for administrative purposes and has not been optimally integrated into teaching and learning activities in the classroom. The use of devices such as projectors or LCDs is also still limited to high classes (grades 5 and 6), and tends to be found more in schools in urban areas. This condition indicates a gap in the use of technology in elementary schools, both in terms of facilities and geographical distribution [1]

In today's digital era, the use of ICT in learning not only increases effectiveness, but can also increase students' interest and motivation in learning, especially at the elementary school level [2].One of the most striking changes is the transformation of learning methods from conventional to digital-based learning. Through the use of technology, the learning process is no longer limited to a certain classroom and time, but can be done flexibly anytime and anywhere. This allows for more interactive and interesting learning innovations for students. One form of technology utilization in education is the use of ICT-based learning media.

Many experts have proposed definitions of media. Experts usually define media from a communication perspective. From an etymological perspective, media is the plural form of the word "medium." The origin of this word in Latin is "between." The term "medium" refers to something that can function as a bridge in the communication process from a communication perspective. "Medium" can also refer to something that facilitates the transfer of information and messages from the communicator or source of the message to the communicant or recipient [3].

In the context of learning, learning media is an important factor in improving the quality of learning [4]. This is due to the development of technology in the field of education that demands optimal efficiency and effectiveness, one of the efforts that needs to be done is to reduce or even eliminate the dominance of the verbalistic system by using learning media. Media that combine visual and verbal elements can improve students' understanding and attraction to learning materials [5]. Meanwhile, Heinich et al. (2002) emphasized the importance of choosing learning media that are in accordance with the objectives, characteristics of students, and the learning environment so that the teaching and learning process takes place effectively. Learning media has an important role in conveying messages, stimulating students' thoughts, attention, and interest in learning [6].

There is no doubt that every student is interested in every subject taught in their school. The willingness of students to participate in learning activities depends on their level of interest in what they are learning. The syllables "interest" and "learning" form interest in learning. Curiosity, learning, awe, or ownership are examples of interest. A student must be motivated to learn because it comes naturally to them [7]. The acquisition of knowledge or skills through teaching and learning activities is a natural process called learning [8].

Students who are motivated to learn will be more enthusiastic in learning. People prioritize one thing over another when it comes to learning, therefore Lee et al. stated that learning interest is a personal preference [9]. Affective and information functions that will arouse strong emotions, such as positive feelings towards something, a sense of attachment, interest, and increased cognitive processes, are related to learning interest [10]. According to [11], students' interests that can be expressed as statements that they prefer one thing over another through involvement in an activity are known as learning interest. A subject tends to get more attention from students who are interested in it.

The relationship between student interest, values, knowledge, and engagement centers on enjoyment [12]. There is a strong correlation between interest and learning; the more students are interested in a subject, the more they want to learn it [13]. Teachers must strive to arouse students' interest in learning, including by setting clear task objectives, utilizing a variety of subjects and tasks, using simulations, and using visual aids for entertainment [14]. Students' interest in learning is one of the important indicators of learning success. Students who have a high interest in learning will be more active and motivated in participating in the learning process [15].

Interest in learning is one of the important factors that influence a person's success in the learning process. High interest in learning not only encourages students to continue exploring and understanding learning materials, but also increases their motivation to achieve educational goals. In the context of education, interest in learning can be interpreted as an individual's interest and desire to learn something [16]. In the current digital era, it offers great opportunities to increase students' interest in learning through innovative technology and diverse resources. However, the use of this technology has not been fully optimized in various educational units, especially at the elementary school level. This is based on the findings of researchers by conducting observations at SD Negeri 27 Tapian Kandis, Palembayan District, Agam Regency, learning is still carried out conventionally. Teachers only rely on LKS books and pictures in books as learning media. This causes low student interest in learning, which is indicated by behavior such as not paying attention to teachers, talking to themselves, going in and out of class, and even not doing assignments.

Therefore, innovation is needed in the form of learning media that is in accordance with the characteristics of 21st century students: digitally literate, active, and like visual and interactive learning [17]. One of the innovative solutions in utilizing technology and to overcome low interest in learning is Google Sites. Google Sites is a platform that can be used to develop web-based learning media easily and efficiently. The advantages of Google Sites as a learning medium are that it is easy to access anytime and anywhere as long as the device is connected to the internet, easy to create, even for beginners, learning is more interesting which can increase students' interest in learning, and this platform allows teachers to create interactive learning websites without requiring special skills in programming. According to Sari and Prasetyo (2020), Google Sites is very suitable for use as a learning medium because it is able to combine various content such as text, images, videos, and links on one learning page that can be accessed anytime via digital devices [18].

This has been proven by several previous studies showing that the use of Google Sites-based media has proven effective in improving student learning outcomes and interests. Research by Lathifatus Saidah (2022), Alfan Hamdani (2021), and Rika Amaliah (2023) concluded that Google Sites-based media is valid, practical, and has a positive impact on learning, although there are still obstacles in terms of device availability [19,20,21].

METHOD

One type of research used is development research, which focuses on research and development (R&D). The type of research used is development research, which focuses on research and development (R&D). Development research is a research method used to determine the effectiveness of a product and produce it. research method used to determine the effectiveness of a product and how to produce it[22].In this study, the researcher chose the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model as a methodological framework because of its systematic, flexible characteristics, and suitability for the scale of focused learning media development. The ADDIE model is considered simpler but still comprehensive compared to more complex R&D models such as Borg & Gall, which have up to ten stages, and tend to be used for large-scale development projects such as curriculum or learning systems as a whole. Meanwhile, the 4D (Define, Design, Develop, Disseminate) model developed by Thiagarajan focuses more on the development of formal instructional devices, and in practice often requires repeated trials in various contexts and broader dissemination stages.

In the context of this study, which focuses on the development of Google Sites-based learning media to increase the interest of fifth grade elementary school students in learning ecosystem material, the ADDIE model is considered the most appropriate because it allows researchers to focus on analyzing student and teacher needs, designing targeted media, developing products effectively, and implementing and evaluating practically in a real classroom environment. ADDIE is also iterative, meaning that it allows adjustments at each stage based on the feedback obtained. Thus, the selection of the ADDIE model provides a balance between procedural simplicity and

pedagogical accuracy, and is relevant for media development research in the context of elementary education with limited resources.

The purpose of this study is to determine the effectiveness of the product in question and provide a positive impact on it. One of the models used in this study is ADDIE. ADDIE is a research and development model with 5 steps, namely: Analysis, Design, Development, implementation, and evaluation[23].In 1996, Dick and Carry developed the ADDIE model for designing instructional systems. Throughout the whole product development process, the ADDIE development research approach is thought to be more thorough and rational. In educational activities, this idea can be used to create a variety of products, including models, learning strategies, teaching methods, media, and learning materials.

The development procedure in the study using the ADDIE model is analysis, design, development, implementation, evaluation. The first stage of analysis is carried out by four activities, namely needs analysis, analysis of student characteristics, curriculum analysis, and analysis of school facilities. The second stage of design is the activity carried out by the researcher, namely Collecting Tools and Materials for Developing Interactive Learning Media, Making learning media materials, Compiling Research Instruments. The third stage of development is the activity carried out by making products and conducting validation. The fourth stage of implementation is the activity carried out by product trials. The fifth stage of evaluation is the activity carried out by evaluating all activities carried out.

RESULT AND DISCUSSION

This research on the development of learning media using Google Sites uses the Research and Development model and is adapted from the ADDIE model which consists of 5 stages, namely analysis, design, development, implementation, and evaluation. The results of the development of learning media using Google Sites to increase students' interest in learning based on the research method used are as follows.

First Analysis Stage, The analysis stage is the initial step in the research of developing learning media using this google site. This stage is carried out four activities, namely needs analysis, student characteristics analysis, curriculum analysis, and school facilities analysis.

Needs analysis, Based on the results of observations made by researchers, it was found that the learning method, especially by grade V teachers, was predominantly lectures, where the role of the teacher was the center of learning while students were less active in a participatory manner. In addition, the lack of utilization of learning media is also a significant problem that causes learning to become monotonous.

Analysis of student character, Students who are the target of the development of learning media using Google Site are fifth grade students. The material for learning media using Google Site is material about ecosystems. Fifth grade students at SDN 27 Tapian Kandis have diverse characteristics but several general patterns can be identified. They are on average 10-12 years old and are classified as early adolescents. In addition, they are members of Generation Z (Gen Z), namely individuals born around the middle to late 2014s to early 2016s, who grew up in the digital era.

Curriculum analysis, The results of the curriculum analysis are carried out to determine the learning achievements that have been set in the independent curriculum. The results of the CP and TP analysis are described into ATP that will be achieved by students through web-based learning media using the Google site for grade V Elementary School students.

Analysis of school facilities, Based on the results of observations and interviews at SD Negeri 27 Tapian Kandis, information was obtained that the availability of facilities that can support the use of

learning media that are developed in good condition, including 3 LCD projector units, 3 speaker units, 1 wifi unit, 35 chromebook units, ownership of laptops by each teacher, adequate electricity sources.

Second Design Stage, The design stage is the second stage carried out in the development of the ADDIE model. The stages carried out by researchers on the design of the product being developed are: Collection of Tools and Materials for the Development of Interactive Learning Media, Making learning media materials, Compiling research instruments.

Third Stage of Development, the development stage is the activity of creating a product that has been designed and realizing it in a real form so that it is in accordance with the aspects needed. For more complete information on web-based learning media using this google site, the researcher attaches the following link to access the media.

https://sites.google.com/guru.sd.belajar.id/mediapembelajarangs/home

After the media is created, the researcher validates the media that has been created with the aim of improving the media that has been created to make it better. Validation is a measure of what should be measured. Validation in research states the degree of certainty of the research measuring instrument against the actual content being measured. Validation in this study was carried out by material/module experts, media experts, and language experts.
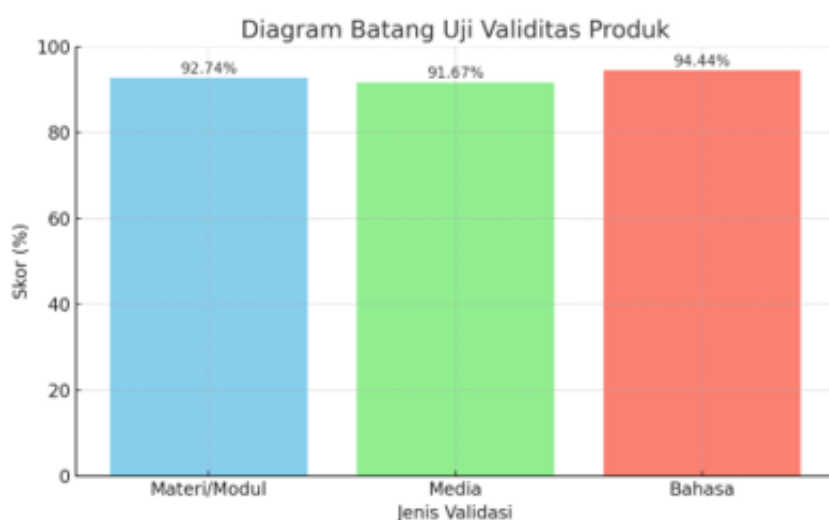

Figure 1. *Product validity test diagram*

All scores fall into the "Very Valid" category, according to the following validity criteria [24].

No	Validity criteria	Validity level
1	81.25% - 100%	Very valid
2	62.50% - 81.25%	Valid
3	43.75% - 62.50%	Quite valid
4	25% - 43.75%	Invalid

Table 1. *Media validity criteria*

Based on the validation results from three experts, the developed web-based learning media showed a very high level of validity. Validation by material/module experts obtained a score of

92.74%, indicating that the content of the material was in accordance with the curriculum, relevant, and easy for students to understand. Meanwhile, validation by media experts produced a score of 91.67%, indicating that the appearance, navigation, and technical functions of the media were considered very suitable for use in learning. Meanwhile, validation by language experts obtained the highest score, namely 94.44%, indicating that the use of language in the media was in accordance with good language rules, communicative, and easy for elementary school students to understand. With the three validation scores in the range of 81.25%–100%, the learning media was declared "very valid" overall and suitable for use in the learning process in elementary schools.

Fourth Implementation Stage, After going through the validation step of the experts, then the Web-based learning media using Google Site will be tested on small groups and large groups. Based on the results of the small group trial of the web-based learning media using Google Site conducted in class V SDN 12 Padang Koto Gadang, data was obtained that the media was classified as very practical. The practicality assessment was carried out through a questionnaire given to 10 students with different abilities and produced a percentage of 97%, which showed that students responded very positively to the media. In addition, the teacher's assessment also showed very good results, with a score of 38 and a practicality percentage of 95%, which is also included in the very practical category. Every aspect tested, both in terms of ease of use, clarity of material, appearance, to relevance to basic competencies, received a positive assessment. Thus, it can be concluded that the web-based learning media using Google Site that was developed has met the criteria of practicality and is suitable for use in the learning process without the need for major revisions.

Based on the pretest and posttest data from 20 fifth grade students of SDN 27 Tapian Kandis, there was a significant increase in scores after the implementation of web-based learning media using Google Site. All students experienced an increase in scores, which is an indicator that the developed learning media is effective in helping the learning process and improving student learning outcomes. Thus, this web-based learning media has been proven to have a positive impact on increasing student knowledge. And this can be proven through the Ngain test using the SPSS application. The following are the results of the Ngain test using SPSS as follows.

	N	Minimum	Maximum	Mean	Std. Deviation
Gain_Score	20	,61	1.00	,8483	,12768
Gain_Percent	20	60.61	100.00	84,8299	12.76779
Valid N (listwise)	20				

Table 2. *Descriptive Statistics*

Based on the table above, it can be seen that the Ngain Score average value obtained is 0.84883>0.7, so the category obtained is high, meaning the level of effectiveness is high. While the Ngain percent value of the average value obtained is 84.8299%. If the average Ngain percent value obtained is >76%, it is categorized as effective. So it can be concluded that the use of a web-based learning media using the Google site in this study can be said to be effective.

Based on the results of the learning interest questionnaire in the table given to 20 fifth grade students of SDN 27 Tapian Kandis after the use of web-based learning media using Google Site, an average percentage of 95% was obtained. These data show that most students gave a positive response to the learning media used, with individual scores generally in the very high category. The high scores on indicators such as interest, enthusiasm for learning, and student activity in learning confirm that this learning media is not only effective in delivering material, but is also able to significantly increase students' interest in learning. Thus, this web-based media is proven to be interesting and worthy of use in the learning process.

Fifth Evaluation Stage, The evaluation stage in developing web-based learning media using Google Site aims to review all aspects related to the media that has been developed, in order to ensure its effectiveness and feasibility. Evaluation is carried out at each stage in the ADDIE model to obtain

useful feedback, including suggestions, criticisms, and input from validators who act as guides in improving and revising the product. For example, during the media validation process, deficiencies were found in the font color contrast that made it difficult to read, so improvements were made to improve readability.

CONSLUSION

This study aims to develop web-based learning media using Google Sites to improve the learning interest of fifth grade elementary school students. The development process follows the ADDIE model which includes the stages of analysis, design, development, implementation, and evaluation. The results of the study showed that the developed media has a very high level of validity, based on the assessment of material, media, and language experts with a score percentage above 90%. In addition, this media is considered very practical based on small group trials which obtained a percentage of 97% from students and 95% from teachers. In terms of effectiveness, this media has been proven to be able to significantly improve student learning outcomes, with an N-Gain value of 0.8483 and a learning completion percentage reaching 84.82%. The student learning interest questionnaire also showed a very high average score, which was 95%. Thus, this Google Sites-based learning media is declared valid, practical, effective, and suitable for use in learning activities in elementary schools.

Based on these findings, it is recommended that teachers and schools begin integrating web-based learning media such as Google Sites into teaching and learning activities, especially in the context of thematic and project-based learning. This platform is free, easily accessible, and does not require high technical skills, making it very suitable for use in elementary school environments. Teachers can use Google Sites to create interactive learning materials, integrate videos, images, quizzes, and external links to create a more engaging and varied learning experience. To maximize the benefits of this media, schools are also advised to hold short training or workshops on creating digital content and using web-based platforms. This is important so that teachers can independently develop media according to student characteristics and curriculum needs. The implementation of Google Sites-based media can also be an initial step in supporting the digital transformation of education in elementary schools, especially in fostering students' digital literacy from an early age. With the right support from schools and collaboration between educators, similar media can be adapted more widely and sustainably in the learning process.

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