JSER

Journal of Science Education Research
Journal homepage: https://journal.uny.ac.id/index.php/jser/index

ISSN: 2597-9701

Google Sites Innovation as A Web-Based Learning Media on Substance Material and Its Changes

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Keywords
learning media, google sites, substances and their changes

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Abstract

The use of Google Sites in learning contexts is still limited because many teachers have not fully utilized the potential of this media. They don't realize that Google Sites has the advantage of creating interesting and interactive learning experiences. Therefore, innovative efforts are needed to optimize the use of Google Sites as an effective learning medium. The aim of this research is to innovate learning media based on Google Sites on substance material and its changes in a valid and practical way. The method used is a 4D model with define, design, develop and disseminate steps. The research sample consisted of 20 class VII students at SMPN 6 Tapung. Data collection techniques for field studies which include observation, interviews and distribution of student response questionnaires. The data analysis technique in this research uses descriptive analysis techniques which explain the results of product development in the form of Google Sites learning media, with data from validation results and practicalities that describe the results of the research conducted. Based on the analysis, it was found that Google Sites-based learning media was very valid with an average validity of 3.68 and practical to use with an average of 3.11. The author makes the following suggestions: science subject teachers need to create varied learning and increase knowledge in technological media to improve efficient and advanced learning.

History
Received:
December 2, 2023
Revised:
February 28, 2024
Accepted:
March 28, 2024

How to cite:
Arrahma, A., Linda, R., & Azizahwati. (2025). Google Sites Innovation as A Web-Based Learning Media on Substance Material and Its Changes. *Journal of Science Education Research*, 9(1), 43-52. oi:https://doi.org/10.21831/jser.v9.i1.69996.

INTRODUCTION

The 21st century is a century where developments in all fields are progressing very rapidly. The emergence of the era of globalization has become a spark of enthusiasm for the world of education to formulate a new learning model in the 21st century (Mashudi, 2021). The rapid development of technology today will continue to produce new patterns in learning and encourage rapid adaptation. In the learning process, the use and utilization of technology in the classroom has become a necessity as well as a demand in the global era (Rijal & Jaya, 2020).

The Merdeka Belajar Curriculum is here as an answer to the tight competition for human resources globally in the 21st century. This curriculum was developed with the hope of producing a millennial generation that is able to understand the material or knowledge taught by teachers quickly, not just being good at remembering the teaching materials given by teachers. Students are also expected to be able to utilize technology in their learning process (Indarta et al., 2022).

One of the important elements of education in the learning process which must follow the flow of technological developments is learning media. According to Nurrita (2018), larning media are tools that can help the teaching and learning process so that the meaning of the message conveyed becomes clearer and educational or learning goals can be achieved effectively and efficiently. Through media as a tool or connecting medium to convey a message or information from educators (teachers) to students (students) in understanding learning. Learning media can also improve the quality of learning for educators as a means to help deliver learning material that is innovative, creative, comprehensive, interesting and creates enjoyable learning situations for students (Orbit, et al. 2021).

Learning media helps students better understand the subject matter. Therefore, it is necessary to use interactive multimedia as an innovation in today's learning media. The technology-based learning media that is commonly used is computers (Akhmadan, 2017). So, the role of media is very important in the learning process so that the material delivered by the teacher arrives quickly and is easily received optimally by students.

Web-based learning media is very suitable as an alternative learning media choice. The web can be used as a learning tool to increase the positive impact of internet users. The presence of web learning media can help overcome the lack of learning time carried out in the classroom. Google Sites is a learning application that is easy to use because it only requires a cellphone and interconnected network, no need to download the application, students or teachers can access it via Google (Adzkiya, 2021).

According to Taufik et al., (2018) stated that Google Sites is an online application launched by Google to create class websites that can be used in learning. With Google Sites, users can combine various information in one place (including videos, presentations, attachments, text, etc.) which can be shared according to user needs. Use of Google Sites is free and can be used by all users who have a Google account. Therefore, the use of technology and the internet can change the way knowledge is delivered and become a solution for implementing learning (Zahroh dan Sholeh, 2022).

So far, learning has only been done with media such as paper, post cards, tools and teaching materials. This media can attract students' interest in learning until they reach understanding, they can remember some material and are not able to develop students' creativity. The technology use in the learning media had not been optimally utilized. Certainly, this had a direct impact on students, namely the reduction of students' learning interest and understanding of the learning material. Moreover, the advancement in technology and the discovery of the dynamics of the learning process make the implementation of educational and teaching activities increasingly demanding in order to obtain various educational media (Een, 2021). The use of Google Sites in learning contexts is still limited because many teachers have not fully utilized the potential of this media. They don't realize that Google Sites has the advantage of creating interesting and interactive learning experiences. Therefore, innovative efforts are needed to optimize the use of Google Sites as an effective learning medium. By taking advantage of the interactive features provided by Google Sites, teachers can create a more dynamic learning experience, combining text, images, videos and audios in one place. In addition, Google Sites also allows students to actively interact with learning content, through links, forms, and various other elements. By enriching the learning experience using Google Sites, it is anticipated that students will become more engaged and motivated to learn (Iman, 2023). Through innovation in the use of Google Sites, learning media can become more effective in conveying learning material and increasing student understanding.

Based on the results of interviews with teachers at SMPN 6 Tapung, it was found that in the learning process, especially science, the material of substances and their changes is material that is very difficult for students to understand, this is because the characteristics of the subject matter contain many abstract concepts, causing students to often be confused in understanding. the concepts contained therein. Lack of creativity in learning activities, lack of discipline of students in following the learning process, students' weakness in solving problems in teaching and learning activities, use of media and learning examples that are less innovative and the learning method still uses the lecture method so that students are considered very boring because there is no variation. in learning activities in each session, this can cause student learning outcomes to decrease.

With Google Sites, teachers can combine various elements such as text, images, videos and audios in one place, creating a more interesting and diverse learning environment (Aulia et al., 2021). Google sites are the easiest way to produce news that can be accessed by people who need it quickly, and people can work together on the site to add attached files and information from other Google software such as Google Docs, Sheets, Forms, and Calendar. tables and so on. using the features offered by Google Sites can support learning, thereby improving student learning outcomes (Arief, 2017). As technology develops, learning methods must adapt to the times. This is because internet technology can facilitate and optimize learning so that it can be done without being hindered by distance and time (Ariessanti, 2017).

Several previous studies stated that the use of Google Sites has an influence on learning. Research conducted by Neni Citra Dewi shows the results that the development of e-learning based on Google sites can be used to improve student achievement (Dewi, 2020). Other research was also carried out by Dilla Safira Adzkiya and Suryaman. This research analyzes the online learning process using Google Sites, with the material presented being

physics material for class XI high school (Adzkiya & Suryaman, 2021). With Google Sites, teachers can easily add learning material in the form of images, videos and assessment questions. These features can be designed attractively.

Based on the explanation above, the development of learning media needs to be carried out as an innovation to support learning activities, especially in science subjects so that learning is more interesting and enjoyable. The researcher offers a solution to the problem above, namely by developing a learning media product based on Google Sites. Google Sites is an application with various interesting advantages (Suryanto, 2018). When used, the material provided no longer needs to be downloaded by students, so it will save more on internet quota and gadget memory. Apart from that, the ease of accessing material via Google sites is an advantage for teachers in delivering the material. On Google sites, evaluation will also be more effective so that teachers can monitor improvements in student learning achievement.

The researcher took substance material and its changes in learning research based on Google Sites pages because not many other researchers have taken this material, and besides that, this material is very unique because learning is based on Google Sites pages. Researchers can combine substance material and its changes with simulations on the website. PhET Interactive Simulation, namely sub-sub changes in substances. The Google site innovation as a web-based learning media is valid for use in learning and practical in its use so that it supports learning at school.

RESEARCH METHOD

The development procedure used as a reference in this research is the 4-D model developed by Thiagarajan in (Endang, 2011). The 4-D development model consists of 4 development stages, namely define, design, develop, and disseminate. Research and development consists of four types of activities, namely: basic research, applied research, product development, and development processes, while it will be described using the descriptive-qualitative method according to (Gumanti, 2016) Qualitative research is research that produces analysis procedures that do not use statistical analysis procedures or other qualification methods. The activities carried out in the development of this website start from the Define stage which consists of (a) problem analysis which includes interviews with educators at schools to determine the extent of the obstacles experienced by educators in delivering material in the learning process in class and to students, (b) analysis of material related to material on changes in matter, (c) formulating objectives by developing this learning website based on material on changes in matter (Prayitno, 2017).

Next is the design stage which consists of (a) media selection by determining the type of media that suits the characteristics and learning needs, (b) designing and making this product is done through 3 stages, namely pre-production, production and post-production. The last is the development stage which consists of (a) validation which is a follow-up to the design stage. The validation stage is carried out by assessing the product results to validators who have competence in their respective fields, (b) revisions are made to improve the assessment results by the validator. (c) the final product is the result of validation by experts which is then continued to the revision stage so that it becomes a learning media that is suitable for use in the learning process at school. However, this research only reaches the development stage and does not use the dissemination stage because at the development stage, the research objectives have been achieved where the learning media developed has been determined to what extent it is suitable to be applied in the learning process (Tilogi et al, 2021).

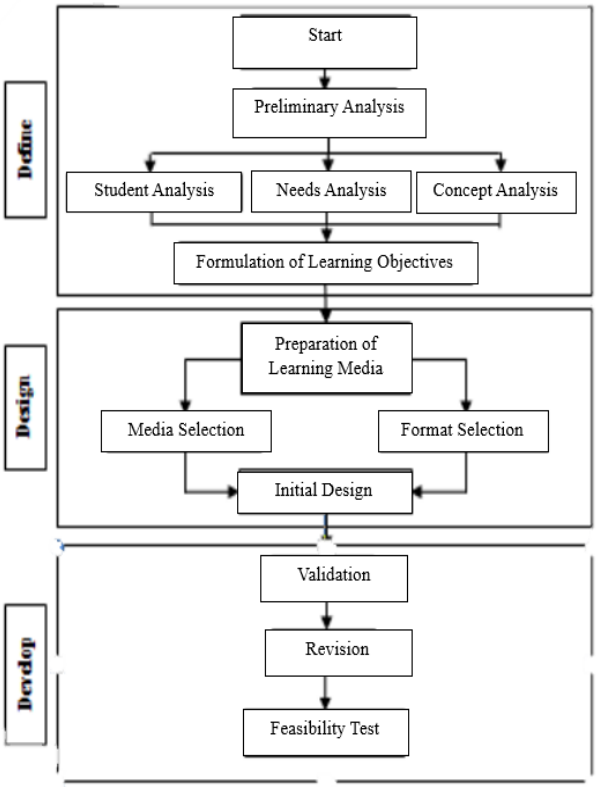

Figure 1. 4D Research Procedures

Product validation involves 3 experts using a validation sheet instrument. This research was conducted in the odd semester of 2023. The data collection techniques used in this research were

observation, interview and validation sheet. To explore the impact of using Google Site learning media, a multiple-choice question instrument was used. Data from Google Site product validation results were analyzed descriptively-quantitatively. Meanwhile, practical data uses data from student response questionnaires. Product validity uses assessment indicators as shown in Table 1 (Lukitaningrum, 2016).

Table 1. Google Sites based learning media validation instrument indicators

Rated aspect	Number of questions
Usability	8
Functionality	6
Visual Communication	8
Learning Design	6
Material Contents	8
Language and Communication	6

After the validity instrument is prepared based on the indicators in Table 1, the validation results carried out by the validator are then calculated using SPSS and then grouped based on validity categories as in Table 2 (Sugiyono, 2014).

Table 2. Likert Scale Validity Categories

Interval	Validity Level
3,41 − 4,00	Very Valid
2,81 – 3,40	Valid
2,01 − 2,80	Less Valid
1,00 − 2,00	Invalid

After validation, the product can be tested to see student responses. The results of student responses are then interpreted as student response scores to see their practicality. Table 3 shows the criteria for interpreting student response scores (Yanto, 2019).

Tabel 3. Criteria for Interpretation of Student Response Scores

Intervals	Category
81% - 100%	Very practical
61% - 80%	Practical
41% - 60%	Quite Practical
21% - 40%	Less Practical
0 – 20%	Not practical

The results of evaluating student reactions are used as a practical evaluation. Google sites-based learning media is used as learning media if the score of achievement is ≥ 61% and very good with a percentage of 81%.

RESULT AND DISCUSSION

The main aim of this development is to create innovative learning media based on Google sites. The result of this research is a product in the form of a Class VII SMP/MTs science learning page based on Google sites on substances and their changes using the 4D model. The following is an explanation of research and development data for each stage:

1. Define Stage

Based on observations and interviews conducted with students and teachers in the field of study, it is known that students according to Jean Piaget's theory of cognitive development are in the formal-operational stage so that they can solve problems through the use of hypotheses and abstract principles. Students are able to use web-based learning media, this is supported by all students who already have Android smartphones as a tool to access learning media.

In terms of use, almost all students who use smartphones only use them for entertainment, such as using social media, chatting, watching videos, and so on. Almost all students have also used learning applications such as Edmodo so learning applications are not something new for them. However, they hope that the presence of this product can contain more interesting learning content, such as lots of pictures, animations, videos, and so on which are of course designed with an attractive appearance so that they can increase their interest in reading through this product.

Identify and detail the main materials that will be studied by students and arrange them in the form of a concept map. This reconstructed concept map is arranged systematically to make it easier for participants to understand the material, where concepts must be arranged from the easy to understand the difficult, from the concrete to understand the abstract.

The main material that will be discussed on this google site is the material of Substance and Its Changes with the learning objectives to be achieved are Students can identify changes in substances in everyday life into physical changes and chemical changes. The results of the analysis of needs and problems that have been found are used as targets in making products, so that later the products developed will be adjusted to the targets and problems that have been found.

2. Design Stage

According to Ariani & Puspasari (2022) the planning stage is divided into four steps, namely a) Preparation of criteria tests; b) Selection of learning media that are appropriate to the material and characteristics of students; c) Selection of the form

of learning presentation that is appropriate to the learning media to be used and d) Making an initial design. In this study, no direct criteria test was prepared in the selection of media based on the results of interviews obtained regarding the learning needs of students.

Researchers designed Google Sites-based learning according to students' conditions and characteristics and adapted to the existing curriculum and CP. This Google Sites-based learning page has seven tools including Home, Learning Achievements, ATP, teaching modules, learning materials, E-LKPD, and more (attendance and evaluation, virtual lab, compiler profile, and web instructions). The choice of format is intended to design or engineer the media, both in terms of content preparation, material selection, preparation of practice questions, and other things that support the preparation of the media to make it more interesting and easier to learn.

3. Develop Stage

Compile a Google Sites based learning page starting with designing the 7 tools with the link page https://sites.google.com/guru.smk.belajar.id/zat-perubahannya/home The resulting page can be seen in the following image.

Figure 2. Home display

Figure 3. Display of Learning Achievements

Figure 4. ATP display

Figure 5. Teaching Module Display

Figure 6. Learning Material Display

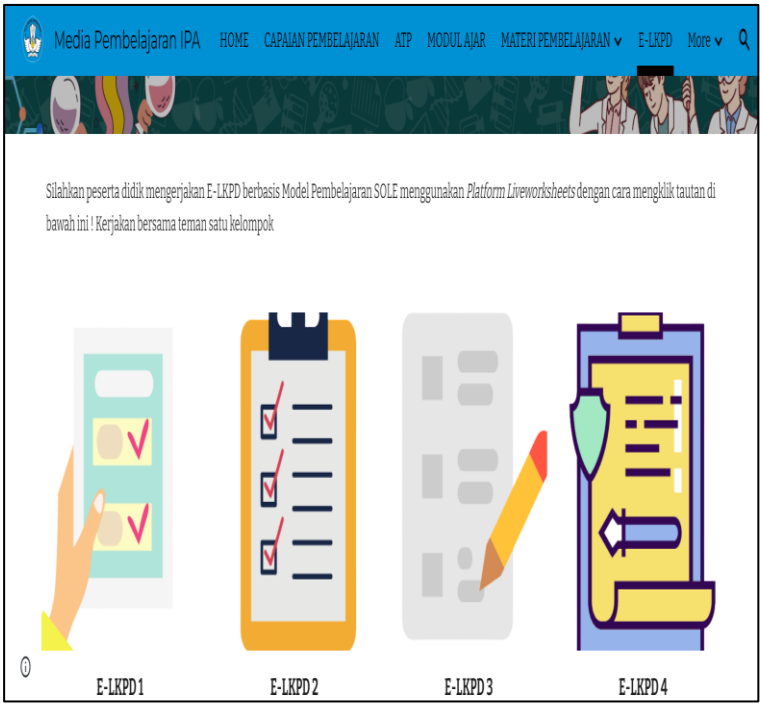

Figure 7. E-LKPD display

Figure 8. More Views (attendance and evaluation, virtual lab, preparer profile, and web instructions)

According to the validation results, it shows that the Google Sites product design is very valid.

Table 4. Learning Media Validation Results (Google sites)

Nu	Assessment Indicators	Average
1	*Usability*	3,67
2	*Functionality*	3,78
3	Visual Communication	3,48
4	Learning Design	3,78
5	Material Contents	3,71
6	Language and Communication	3,67
	Average	3,68

Based on Table 4, it shows the results of learning media validation from three expert validators in each aspect which has an average validation of 3.68 or equivalent to 81% in the very valid category. based on the validity indicators of Usability, Functionality, Visual Communication, Learning Design, Content of Material, and Language and Communication shows the usability reaches 3.67 which indicates that the web media is very valid to use, then for the functionality in the usability of the web reaches 3.78 with the criteria of very valid functionality. The visual communication indicator is 3.48 with the criteria of very valid as a visual communication media for students in learning. The learning design indicator shows a score of 3.78 with the criteria of very valid, meaning that the learning design in the web media is very suitable for use according to the needs of student character design. The content of the material indicator also shows 3.71 which means that the content of the material is very valid with the needs of students in learning related to the material of changes in matter. The language and communication indicators show a validity of 3.67 with the criteria of very valid so that it is easy for students to understand. The validation results also show suggestions from the validator, namely regarding writing and neatness of images so that there are improvements in image size and writing grammar used on Google in the questions and discussions presented. So it can be concluded that Google Sites-based learning media which was developed based on substance material and its changes is declared as appropriate learning media and can be used as teaching material in learning activities. This is relevant to the research results (Novelia and Dheni, 2022). The Google Sites web-based learning media on ionic and covalent bond material that has been developed has met the standard criteria based on the BSNP and is valid and does not need revision, and research (Fatnah and Taufik, 2023) shows that The development of Google Sites-based learning media on light material for class VIII SMP which was developed through research and development is classified as very good and worthy of development.

Web media that are suitable for use as learning media are educational information provider sites and website-based learning media. With the existence of web learning media according to student needs, it will certainly facilitate learning media and the delivery of learning materials optimally, making it easier for both teachers and students in learning. In addition, it can be accessed at any time by students and teachers. Based on the overall assessment of Google Sites-based learning media, it is concluded that this learning media is very valid and very practical so it is suitable to be used as learning media. A learning media will be said to be good and effective if it has good planning. Thus, the learning media developed in this research is in accordance with the plans prepared in the research and development stages carried out.

4. Disseminate Stage

The disseminate stage in the 4-D development model is the final stage in the learning media development process. At this stage, the learning media that has been developed will be distributed or distributed to target users or students. In this case, it is class VII students at SMPN 6 Tapung, as a test of the feasibility of a site-based learning page.

The practicality seen in this study is the practicality of using learning products, namely web-based learning media. This practicality is also one of the measures of whether web learning media is said to be good or not. In this case, practicality is also interpreted as ease in organizing, and in examining or determining objective decisions, so that decisions are not biased and doubtful. Practicality is also related to the efficiency and effectiveness of time and funds. A test is said to be good if it does not require a lot of time in its implementation, and does not require large or expensive funds.

The practicality of an evaluation tool places more emphasis on the level of efficiency and effectiveness of the evaluation tool, several criteria put forward by Gerson et al in measuring the level of practicality, including: (1) The time required to compile the test; (2) The costs required to administer the test; (3) The time required to carry out the test; (3) The level of difficulty in compiling the test, (4) The level of difficulty in the test examination process; (5) The level of difficulty in interpreting the test results.

From the results of the student response questionnaire after using the Google Sites learning page, the motivation component had an average of 3.06, media clarity 2.91, material understanding 3.55, difficulty of access 3.59 and ease of access

with an average value. 3.16. Meanwhile, the overall practicality average has a value of 3.11, which means that the learning media on this page has practical or decent quality. This is in line with Putri et al., (2021) research that Google Sites web-based physics learning media material on Newton's laws of object motion meets the requirements with very decent quality and is very interesting to use as learning media for class X students. Research by Auliana et al (2023) media The development of physics based on Google Sites with a problem based learning approach meets the requirements and criteria which is very feasible and is very good for use as a learning medium for Momentum and Impul material.

This Google Sites-based learning can make students directly practice the material on substances and their changes so that learning is more interactive and enjoyable for students and makes it easier to understand the material and conclude the concepts in the material through the features in Google Sites. This is in line with the research of Ramadannisa & Hartina, (2021) which states that web-based learning using Google Sites can be a solution to make students interested in learning. With a design that can be arranged as attractively as possible and can be connected to other online facilities in the form of images, animations, videos and even simulations, it is hoped that it can make students interested and can help students in the learning process independently without teachers.

Web-based science learning has a feature, called test your skill, which can be used in core learning activities where students can learn with Student Worksheet (LKPD) directly and digitally on the website. Teachers can also share materials, videos, images, and links that students can easily download and access. Using web-based science learning with the help of Google Sites makes it easier for students to do assignments, carry out more interactive discussions, and work on the LKPD (Azari et al, 2023).

CONCLUSION

The design for developing learning media based on Google Sites on substance material and its changes for class VII SMP which was developed through research and development (Research and Development) is classified as very valid and worthy of development. This is based on research data with validation results from 3 experts showing a score of 3.68 in the very valid category. The use of Google Sites products shows feasibility with a score of 3.11 in the practical category. Based on the results of this analysis, it can be concluded that the learning media based on Google Sites on substance material and its changes is valid and practical to use.

The author's continued development of Google Sites-based learning media or for new developments has great potential, especially by prioritizing innovation, such as adding new features. Additional features can be made so that the learning media developed is more effective and efficient and attracts more interest from users. In this way, products will be obtained that are increasingly high quality and can enrich students' learning experiences and inspire teachers to be part of the development of similar and more varied learning media.

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