

Analysis of The Practicality of Google Sites Web-Based Learning Media on The Skeletal System Material for Student Grade XI

Firdaus Daud^{1*}, Rafida Roslan², St. Fatmah Hiola³, Arifah Novia Arifin⁴, Muh. Wahyudi Jasman⁵

^{1,2,3,4}Biology Department, Faculty of Mathematic and Natural Sciences, State University of Makassar

⁵Biology Education Master Program, Department of Biology, Faculty of Faculty of Mathematic and Natural Sciences, State University of Malang

¹Email: firdaus.daud@unm.ac.id

¹Email: wiharto09@gmail.com

²Email: rafidaroslan5@gmail.com

³Email: fatmah.hiola@unm.ac.id

⁴Email: arifahnoviaarifin@unm.ac.id

⁵Email: muh.wahyudi.2203418@students.um.ac.id

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ABSTRACT

Learning media is everything teachers use to convey information to students, and it aims to provide stimulation and motivation to students so that there is an improvement in the quality of learning. This research aims to produce Google Sites web-based learning media as a learning medium on the subject of a valid and practical skeletal system for high school students. This type of research is Research & Development (R&D) research, which adapts the ADDIE model. The practicality analysis stage is carried out after the development stage, with product trials during the learning process. The subjects of the study were two biology teachers and 30 students of class XI Science 2. Collecting practicality data uses a questionnaire on the practicality of teacher and student responses. The questionnaire was filled out to see the practicality of the Google site's web, which was obtained through the responses of teachers and students. Based on data analysis, the practicality of the Google Sites web obtained an average teacher response score of 92.06% (very practical) and an average student response score of 85.06% (very practical). Based on the study results, it can be concluded that the Google site's web-based learning media on skeletal system materials meets the practicality criteria.

Index Terms: Google Sites, Web-Based Learning, Practicality

I. INTRODUCTION

Information technology causes science to develop [1], [2]. Every innovation is created to benefit human life positively, especially in education [3]. In the Indonesian National Education System Law No. 20 of 2003, it is stated that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual, religious, self-control, personality, intelligence, noble morals, and skills needed by themselves and society.

The world of education must follow the development of the industrial revolution 4.0, which utilizes the development of information and communication technology as a facility in the learning process [4], [5], [6]. Information and communication technology will provide various conveniences, including facilitating learning [7]. In addition, it is hoped that information technology will implement *the student-centred learning paradigm* from *teacher-centred* [8], [9].

In line with the development of information and communication technology, the role of teachers is crucial to the learning process so that teachers become facilitators in learning (Abedi, 2024; Koroleva et al., 2021). Teachers try to prepare for the needs of the teaching and learning process, one of which is learning media [12]. In understanding the media, it is an intermediary in delivering or sending messages and information [13], [14]. Rushby & Surry (2016) said using media and technology when the sender conveys messages and information to the recipient can be effective. Media supports learning activities in acquiring knowledge, skills, and attitudes [16], [17].

The development of technology requires teachers as educators to play the role of learning facilitators and must be able to provide facilities and media that make it easier for students in the learning process [18], [19]. One of these abilities is mastering technology in learning—technology-based learning media, often called ICT [18], [20]. The use of learning media provides many conveniences for educators and students. Offline technology-based press can be Computer Basic Learning (CBL) [21]. Meanwhile, the use of online media can be in the form of online learning or web-based learning [22], [23] or distance learning [24], [25]. E-learning refers to a learning process where mobile electronic devices are used in the learning process which is equipped with telecommunication facilities (internet and intranet) and multimedia (graphics, audio and video) as the primary medium in the delivery of material and interaction between educators and students [26], [27].

Web-based learning media is a learning medium and resource that allows students to learn independently without the presence of a teacher [28]. The existence of this media will stimulate brain performance to be more optimal [29]. *Online websites* will provide innovations in education with the rampant use of communication media, so website learning media is indispensable [30], [31]. *Online website learning* will make learning more accessible because it requires students to access material independently with their efforts [32], [33].

The web, part of the internet, can be used as a medium and a source of learning [34]. The *web* can increase students' insight through access to information that is carried out independently and is not limited by space and time [28], [35], [36]. The use of *websites* can also affect students' learning outcomes, especially in the cognitive realm [29], [37], [38]. Although the web has various benefits in education, few still use it, especially in the learning process as a learning medium [39].

Google Sites is one web part still unknown to educators [40]. *Google Sites* can be used as an innovation in learning [41], [42]. Using *Google Sites* integrates technology into learning [43], [44]. Therefore, the importance of innovating in education is more remarkable, more effective, and more efficient [45]. *Google Sites* provides easy access to information by adding information attachment files and other Google information such as Google Docs, sheets, forms, calendars, videos from YouTube and others [38], [42].

The observation results showed a need for students to learn media in the concept of skeletal systems. Therefore, it is necessary to develop learning media that support a more innovative and efficient student learning process, including *the Google Sites website*. Tran & Nguyen Ngoc (2023) stated that using *the Google Sites web* presents material supported by images and videos and can be collaborated with interesting quiz sites and learning tasks. The development of *Google Sites' web-based learning media* is expected to guide students in learning and understanding materials about science, such as skeletal systems [47]. Based on the things explained above, the author is interested in developing *a Google site's web-based learning media* by utilizing the features of Google.com to become a learning medium. The purpose of this study is to test the validity of the *Google Sites web-based learning media* that has been developed.

II. METHOD

A. Research Design

The research conducted is *Research and Development (R&D)* research which consists of five stages, namely (1) analyze, (2) design, (3) *development*, (4) *implementation*, and (5) *evaluation* [48]. At the analysis stage, problems in the learning process will be found, and these will then be formulated to solve the problem. A needs analysis was carried out by conducting interviews with teachers in the field of biology and distributing a needs analysis questionnaire to students. The study results showed that several needs of teachers and students were needed to overcome these problems.

The design stage is carried out by designing a storyboard and compiling instruments that will be used to assess the practicality of the *Google site's website*. The instrument used was a questionnaire of teacher and student responses. The development stage is by realizing all the stages that have been carried out previously and producing the final product of *Google Sites web-based learning media* on human skeletal system material for grade XI of high school. The practicality test of *Google Sites' web learning media* was carried out by two biology teachers and 30 students in class XI Science 2 SMAN 4 Sidrap, South Sulawesi. The level of practicality refers to Ridwan (2010), who said that product development is practical if the average result of the response of teachers and students is in the proper and very practical category.

The implementation stage is carried out in learning to find out the practicality of the media. The application was carried out with small groups to get input from teachers and students as material for improving the product draft.

The evaluation stage is carried out after the development product has been implemented. This study's evaluation stage analyzes the practicality of *Google Sites' web-based learning media*. The practicality analysis was carried out by analyzing the data on the results of the teacher's response and the student's response.

B. Data Analysis

Based on the assessment results, the average score given is determined, and then the average score of the teacher's response and the student's response to each question is calculated. Sudjana (2007) proposed that to determine the percentage of respondents' assessment, the formula:

$$PRR = \frac{\Sigma \text{ Respondent Score}}{\Sigma \text{ Respondent} \times \Sigma \text{ Item} \times \text{Highest Scale}} \times 100\%$$

Information:

PPR : Percentage of respondents' ratings
 Σ Respondent Score : The number of scores given by all respondents
 Σ Respondent : Number of Respondents
 Σ Item : Number of Items Assessed

After obtaining the percentage of the respondent's assessment, the percentage score of the statement indicator is determined using the formula.

$$SIS = \frac{\Sigma \text{ Assesment Aspect Score}}{\Sigma \text{ Aspect}}$$

Information:

SIS : Statement indicator score
 Σ Assesment Aspect Score : The number of scores given by all respondents
 Σ Aspect : Number of Aspects

Furthermore, the percentage score of the respondent's statement indicator is adjusted to the practicality criterion (Ridwan, 2010).

Table 1 Categories of Teacher and Student Practical Assessment

Value (%)	Category
85% < RS	Very Practical
70% ≤ RS < 85%	Practical
50% ≤ RS < 70%	Less Practical
RS < 50%	Impractical

III. RESULTS AND DISCUSSIONS

The practicality test is carried out by introducing the product to teachers and students and then the application of the product in the learning process. After the implementation was carried out, teachers and students filled out the response questionnaire given. Based on the results of the analysis of Google Sites web practicality data, it was obtained:

A. Results of teachers' responses to google sites *web-based learning media*

Table 2 Results of teacher response analysis

No.	Assessment Aspects	Average (%)	Information
1	Learning completeness	98,33	Very Practical
2	Content eligibility	90,00	Very Practical
3	Display aspect	91,43	Very Practical
4	Product Operation	90,00	Very Practical
5	Language use	90,00	Very Practical
6	Software Engineering	97,50	Very Practical
Average		92,88	Very Practical

Based on table 2 shows that the results of the teacher's response to the Google Sites *web-based learning media* are included in the very practical category with an average overall score of 92.88% by looking at the practicality category of 85% ≤ RS (average score) it can be stated that the google sites *web-based learning media* is very practical judging from the teacher's response.

B. Results of students' responses to google sites *web-based learning media*

Table 3 Results of students' response analysis

No.	Assessment Aspects	Average (%)	Information
1	Content relevance	89,60	Very Practical
2	Product display	86,80	Very Practical
3	Product Operation	83,83	Practical
4	Paradigma Constructis	83,07	Practical
5	Use of Language	82,00	Practical
Average		85,06	Very Practical

Table 3 shows that the results of the student response instrument to the Google sites *web-based learning media* are included in the very practical category with an overall average score of 85.06% with a practicality category of $85\% \leq RS$ (average score) so that it can be stated that the development of Google sites *web-based learning media* is very practical judging from the students' responses.

In the introduction and use activities, it was seen that the students were very enthusiastic, where each student learned and listened to the material using their respective smartphones. Some of the features of concern to students include video content, crossword puzzles, and the presentation of material layouts with attractive visuals. The selection of colours considered beautiful and appropriate as an exciting learning medium, especially skeletal system materials, makes it easier for them to understand the material faster.

The results of the product practicality analysis show that teachers and students give a very practical response to the use of *the Google Sites website*. This is because *the Google site's website* can attract students to learn independently. In addition, the existence of *Google sites* can make it easier for students to relearn things they do not understand without being limited in time [28], [36]. The students also felt immensely helped by the *existence of the Google site's website, which supports learning on technology-based skeletal system materials*. It aligns with Aljraiwi (2019), who states that technology-based learning media can increase learning motivation, make learning more exciting and enjoyable, and influence learning outcomes.

The practicality and potential of Google Sites as a learning tool highlight its significant role in enhancing students' cognitive abilities and improving learning efficiency [38]. By enabling independent learning, Google Sites fosters critical thinking as students navigate and explore content at their own pace [39]. Its flexibility allows learners to revisit and reinforce concepts without time constraints, supporting deeper understanding and retention [43]. Moreover, as a technology-based platform, Google Sites transforms traditional learning into an engaging, interactive experience that motivates students and enhances their outcomes, aligning with the principles of modern educational practices [44], [46].

The practicality analysis demonstrates that Google Sites is compelling and potentially boosts students' learning motivation. Its interactive and user-friendly design encourages independent exploration, fostering a sense of autonomy and curiosity among learners. Offering unlimited access to review materials empowers students to address their learning gaps at their own pace, reducing frustration and enhancing confidence. Furthermore, as a technology-based learning tool, Google Sites transforms abstract concepts, like skeletal systems, into engaging and relatable experiences, making the learning process more enjoyable and impactful. It aligns with research emphasizing that innovative digital platforms can drive students' enthusiasm and positively influence their academic performance.

CONCLUSION

The results of the practicality test of teacher and student responses show that the Google Sites web-based learning media developed is very practical. Based on this, the author hopes that the Google site's website, which has been created, can be used by teachers as a biology learning medium because it has gone through validity tests and practicality tests. The findings also highlight the novelty of integrating Google Sites into skeletal system material, providing a fresh perspective on leveraging digital platforms in biology education. This research implies that future studies can further explore its impact on adaptability to other science topics, thus contributing to developing innovative, technology-driven learning strategies.

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