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Usability Evaluation of a Google Sites-Based E-Learning Platform Using the ISO 9241-11:2018 Standard

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Abstract

This study aims to evaluate the usability of an e-learning system developed using Google Sites at SMA Negeri 6 Bengkulu Tengah based on the ISO 9241-11 standard. The evaluation focuses on two main aspects, namely effectiveness and user satisfaction. The research employed a quantitative descriptive method with data collected through questionnaires distributed to 30 students and 2 teachers. The results show that the effectiveness aspect achieved a percentage of 94.4% for teachers and 88.4% for students, both categorized as "very good." Meanwhile, the satisfaction aspect obtained 90% from teachers and 86.67% from students, also categorized as "very good." These findings indicate that the e-learning system is able to support the learning process effectively and provides a high level of user satisfaction. Therefore, the Google Sites-based e-learning platform can be considered feasible and useful as a learning medium in the school environment.

Keywords: E-learning; Google Sites; Usability; ISO 9241-11; Effectiveness.

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1. Introduction

The development of information and communication technology has driven significant transformations in education, particularly through the utilization of digital learning media that are more flexible, interactive, and easily accessible. One form of this technological implementation is e-learning, which enables students to access learning materials, assignments, and resources online without limitations of time and place. The use of e-learning not only enhances learning effectiveness but also contributes to improving the quality of education in the digital era (Komaria *et al*., 2025). One of the platforms widely used in developing web-based learning media is Google Sites. This platform allows educators to create and manage learning content integrated with various Google services, such as Google Drive, Google Forms, Google Docs, and YouTube, without requiring programming skills (Putri, 2024). This ease of use makes Google Sites a practical and accessible alternative for supporting online learning processes.

Previous studies have shown that Google Sites has strong potential as a learning medium. Research indicates that Google Sites is effective in delivering structured learning materials and improving student learning outcomes (Putri, 2024; Simanjuntak, 2023; Faizah *et al*., 2024). In addition, high feasibility levels and positive user responses have been reported in the implementation of Google Sites-based learning media (Suriansyah & Susanto, 2024). These findings suggest that technology-based learning media play an important role in enhancing student engagement and learning outcomes. However, the success of a learning system is not only determined by the quality of content but also by the ease with which users can access and use the system. In this context, usability becomes a crucial factor to ensure that the system can be used effectively and provides a satisfying user experience.

According to ISO 9241-11:2018, usability consists of three main aspects: effectiveness, efficiency, and satisfaction within a specified context of use. Usability evaluation allows researchers to assess how well a system supports users in achieving their goals. Several studies have shown that usability significantly influences system quality and user satisfaction (Rosalinda *et al*., 2018; Adilawati *et al*., 2023). Furthermore, usability evaluation in e-learning systems can provide a comprehensive overview of the quality of digital learning platforms (Wayan Juli *et al*., 2024). Studies on online learning also highlight that user experience, interface quality, and ease of navigation are critical factors in determining the success of digital learning systems (Fitri & Lubis, 2024; Karmila *et al*., 2025). These findings emphasize that usability plays a strategic role in enhancing the effectiveness of technology-based learning.

SMK MJPS 1 Tasikmalaya has implemented a Google Sites-based e-learning system to support the learning process. However, there has been no specific study evaluating the usability of this system based on the ISO 9241-11:2018 standard. Most previous studies have focused on learning effectiveness and student outcomes, while usability evaluation emphasizing user experience remains limited. Therefore, this study aims to evaluate the usability of the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya, focusing on the effectiveness and satisfaction aspects based on the ISO 9241-11:2018 standard. The results of this study are expected to provide insights into the system's usability quality and serve as a basis for improving e-learning services in the school environment.

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2. Literature Review

2.1 First Previous Study

A study conducted by Wayan Juli *et al*. (2024) evaluated the usability of the DIL-MicLearn system using the ISO 9241-11 standard and the User Experience Questionnaire (UEQ). The results showed an effectiveness level of 94% and an efficiency level of 89%. These findings indicate that the ISO 9241-11 method can be effectively applied to evaluate the usability of e-learning systems.

2.2 Second Previous Study

Research by Rosalinda *et al*. (2018) examined the usability of a Personnel Management Information System (SIMPEG) based on ISO 9241-11. The study found that the aspects of effectiveness, efficiency, and satisfaction significantly influence system usability. Among these factors, satisfaction was identified as having the greatest impact on the overall quality of system usage.

2.3 Third Previous Study

A study conducted by Suriansyah (2024) focused on the development of learning media based on Google Sites. The results showed that the developed media achieved a feasibility level of 89%, categorized as "very feasible," and received positive responses from students with a score of 92.8%, categorized as "very good." These findings suggest that Google Sites is suitable for use as a web-based learning medium.

3. Methodology

The usability measurement in this study refers to the ISO 9241-11:2018 standard, which consists of three main aspects: effectiveness, efficiency, and user satisfaction. However, this study focuses only on effectiveness and user satisfaction. This is because measuring the efficiency aspect requires direct observation of task completion time, which was not conducted in this study.The population of this study includes all users of the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya. The sample was determined using purposive sampling, where respondents were selected based on specific criteria, namely active users of the e-learning system. The total number of respondents was 37, consisting of 35 students from the 10th grade of Computer and Network Engineering (TKJ) and 2 subject teachers.

Data collection techniques included observation, interviews, documentation, and questionnaires. The research instrument was a questionnaire developed based on the indicators of effectiveness and user satisfaction, referring to the ISO 9241-11:2018 standard. The instrument was validated through expert judgment to ensure the relevance of each item to the research objectives. A five-point Likert scale was used as the measurement scale.

Table 1. Mean Score Category

Score Range	Category
4.21 – 5.00	Very Good
3.41 – 4.20	Good
2.61 – 3.40	Fair
1.81 – 2.60	Poor
1.00 – 1.80	Very Poor

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Data analysis was conducted using descriptive statistics by calculating the mean score and percentage of usability for each aspect. The mean score was calculated using the following formula:

$$\bar{X} = \frac{\Sigma x}{n}$$

where:
X = mean score
∑ x = total score obtained from respondents
n = number of respondents × number of items

The usability percentage was calculated using the formula:

$$\rho \frac{Obtained\ Score}{Maximum\ Score}\ x\ 100\%$$

P = usability percentage
Obtained Score = total actual score
Maximum Score = number of respondents × number of items × highest score

The results were then interpreted using the percentage criteria shown in Table 2.

Table 2. Percentage Category

Percentage	Category
81% – 100%	Very Good
61% – 80%	Good
41% – 60%	Fair
21% – 40%	Poor
0% – 20%	Very Poor

In this study, usability classification is primarily based on percentage values; therefore, the interpretation of results emphasizes percentage scores rather than mean values.

4. Results and Discussion

4.1 Results

Based on the results of the study conducted on 35 students and 2 teachers who use the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya, the usability measurement results were obtained for the effectiveness and user satisfaction aspects.

4.1.1 Effectiveness Questionnaire Results

Table 3. Effectiveness Results

Respondents	Total Score	Maximum Score	Percentage	Category
Teachers	90	100	90%	Very Good
Students	1220	1750	69.71%	Good

The results indicate that the effectiveness level of the e-learning system usage reached 90% (Very Good) for teachers, while students achieved 69.71% (Good).

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4.1.2 User Satisfaction Questionnaire Results

Table 4. User Satisfaction Results

Respondents	Total Score	Maximum Score	Percentage	Category
Teachers	85	100	85%	Very Good
Students	1184	1750	67.66%	Good

Based on Table 4, user satisfaction among teachers reached 85% (Very Good), while students obtained 67.66% (Good).

4.1.3 Usability Testing Results

Usability was calculated by determining the mean scores of effectiveness and satisfaction.

a) Student Usability Analysis
   Mean Effectiveness = 1220 / 350 = 3.49
   Mean Satisfaction = 1184 / 350 = 3.38
   Mean Usability = (3.49 + 3.38) / 2 = 3.44
b) Teacher Usability Analysis
   Mean Effectiveness = 90 / 20 = 4.50
   Mean Satisfaction = 85 / 20 = 4.25
   Mean Usability = (4.50 + 4.25) / 2 = 4.375

Table 5. Usability Testing Results

Respondents	Mean Effectiveness	Mean Satisfaction	Mean Usability	Category
Teachers	4.50	4.25	4.375	Very Good
Students	3.49	3.38	3.44	Good

The results show that the mean usability score for students is 3.44 (Good), while for teachers it is 4.375 (Very Good). To determine the overall system usability, a weighted average was calculated:

$$Mean\ Usability = \frac{(3.44 \times 35) + (4.375 \times 2)}{37} = 34.9$$

This value falls into the Good category, indicating that the Google Sites-based e-learning system has a good level of usability and is feasible for use as a learning medium.

4.2 Discussion

The findings indicate that the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya demonstrates a good level of usability based on the effectiveness and satisfaction aspects in accordance with the ISO 9241-11:2018 standard. In terms of effectiveness, teachers achieved a score of 90% (Very Good), while students obtained 69.71% (Good). This suggests that the system effectively supports users in accessing learning materials, completing assignments, and obtaining academic information. These findings are consistent with previous research (Putri, 2024), which states that Google Sites is effective as a digital learning medium due to its accessibility and structured content delivery. Similarly, Faizah *et al*. (2024) found that Google Sites improves learning effectiveness compared to conventional media. This similarity indicates that the simplicity and ease of use of Google Sites contribute to its effectiveness in supporting learning activities.

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Regarding user satisfaction, teachers reported a satisfaction level of 85% (Very Good), while students achieved 67.66% (Good). This indicates that most users are satisfied with the system. These findings align with Rosalinda *et al*. (2018), who emphasized that user satisfaction is a key factor in determining system usability. Additionally, Adilawati *et al*. (2023) highlighted that satisfaction is closely related to user experience when interacting with a system. The results of this study reinforce the idea that systems that are easier to use tend to yield higher user satisfaction. The usability testing results show that the mean usability score for students is 3.44 (Good), while teachers achieved 4.375 (Very Good). Overall, the system's mean usability score is 3.49, categorized as Good. These findings indicate that the system meets usability criteria, particularly in terms of effectiveness and satisfaction, based on ISO 9241-11:2018.

These results are consistent with the study by Wayan Juli *et al*. (2024), which evaluated the usability of the DIL-MicLearn e-learning system using ISO 9241-11 and found high effectiveness and efficiency levels. Although the research objects differ, both studies demonstrate that usability testing is effective in assessing system performance in supporting user activities. Despite the positive results, several limitations were identified through observation and interviews. These include a relatively simple user interface, suboptimal navigation, and internet connectivity issues that affect user comfort when accessing the system. These findings indicate that although Google Sites is easy to use, it still has limitations in interface design and navigation compared to more advanced Learning Management Systems (LMS).

These findings imply that continuous system improvement is necessary to enhance user experience. Improvements should focus on optimizing navigation structure, enhancing interface design, and improving system responsiveness under varying network conditions. By addressing these aspects, the usability of the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya can be further improved, leading to a more effective and satisfying learning experience.

5. Conclusion

Based on the results of this study, it can be concluded that the Google Sites-based e-learning system at SMK MJPS 1 Tasikmalaya has a good level of usability and is feasible to be used as a learning medium. The effectiveness aspect achieved a score of 90% for teachers and 69.71% for students, while the user satisfaction aspect reached 85% for teachers and 67.66% for students. The usability testing results show that the mean usability score is 4.375 for teachers and 3.44 for students. Overall, the system’s mean usability score is 3.49, which falls into the “Good” category. These findings indicate that the Google Sites-based e-learning system is capable of effectively supporting the learning process while providing a satisfactory user experience.

This study contributes by providing empirical information regarding the usability level of a Google Sites-based e-learning system based on the effectiveness and satisfaction aspects, referring to the ISO 9241-11:2018 standard. The findings can serve as an evaluation reference for schools in improving the quality of digital learning implementation. However, this study has several limitations. It only measures two aspects of usability—effectiveness and satisfaction—without including the efficiency aspect as recommended in ISO 9241-11:2018. In addition, the number of respondents is limited to a single school. Therefore, future research is recommended to evaluate all three usability aspects comprehensively, involve a larger and more diverse sample, and examine the impact of improvements in user interface design, system navigation, and internet accessibility on user experience..

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