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Usability Evaluation of SIFOSA Using the System Usability Scale (SUS) Method

Penilaian Kebolehgunaan SIFOSA Menggunakan Kaedah Skala Kebolehgunaan Sistem (SUS)

Meta Amalya Dewi[1], Willy Johan Widjaja Saputra[1], Dina Fitria Murad[1], Agus Putranto[1], Dendhy Indra Wijaya[2]*

[1]Information Systems Department, BINUS Online, Bina Nusantara University, Jakarta, Indonesia
[2]Industrial Engineering Department, BINUS Online, Bina Nusantara University, Jakarta, Indonesia

**Corresponding author: meta.dewi@binus.edu*

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ABSTRACT

Digital transformation in education is essential for achieving Sustainable Development Goal 4 (Quality Education), particularly in rural areas where digital literacy remains low. However, limited technological literacy among educators and students in these areas presents a significant challenge in adopting digital tools. This study evaluates the usability of the Nature School Information System (SIFOSA), implemented at the Darul Furqan Foundation in Air Santok Village, Pariaman. The evaluation focuses on how effectively SIFOSA can support administrative and academic processes in a nature-based, IT-oriented, and Islamic boarding school environment. Using the System Usability Scale (SUS) method, data was collected from teachers, administrators, and students with varying levels of technological proficiency. The system obtained a SUS score of 78.5, which categorizes it as "good" in terms of usability. These findings indicate that SIFOSA is functionally robust and user-friendly, even in contexts with low digital literacy. The study concludes that SIFOSA has strong potential to improve digital literacy and operational efficiency in rural schools, and can serve as a model for similar educational environments aiming to implement user-centric digital systems.

Keywords**:** SIFOSA; SUS; Educational Technology; Rural Education; Digital Literacy

ABSTRAK

Transformasi digital dalam sektor pendidikan memainkan peranan kritikal dalam mencapai Matlamat Pembangunan Mampan 4 (Pendidikan Berkualiti), khususnya di kawasan luar bandar. Walau bagaimanapun, literasi teknologi yang terhad dalam kalangan pendidik dan pelajar dalam bidang ini memberikan cabaran yang ketara dalam menggunakan alat digital. Kajian ini bertujuan untuk menilai kebolehgunaan Sistem Maklumat Sekolah Alam (SIFOSA) yang dilaksanakan di Yayasan Darul Furqan di Kampung Air Santok, Pariaman. Penilaian memfokuskan kepada keberkesanan SIFOSA boleh menyokong proses pentadbiran dan

akademik dalam persekitaran sekolah berasrama penuh berasaskan alam semula jadi, berorientasikan IT dan Islam. Menggunakan kaedah Skala Kebolehgunaan Sistem (SUS), data dikumpul daripada guru, pentadbir dan pelajar dengan pelbagai tahap kecekapan teknologi. Sistem ini memperoleh skor SUS sebanyak 78.5, yang mengkategorikannya sebagai "baik" dari segi kebolehgunaan. Penemuan ini menunjukkan bahawa SIFOSA berfungsi dengan teguh dan mesra pengguna, walaupun dalam konteks dengan literasi digital yang rendah. Kajian itu menyimpulkan bahawa SIFOSA mempunyai potensi yang kuat untuk meningkatkan literasi digital dan kecekapan operasi di sekolah luar bandar, dan boleh berfungsi sebagai model untuk persekitaran pendidikan yang serupa yang bertujuan untuk melaksanakan sistem digital berpusatkan pengguna.

Kata kunci**:** SIFOSA; SUS; Teknologi Pendidikan; Pendidikan Luar Bandar; Celik Digital

INTRODUCTION

Digitalization has emerged as a key driver of development in both urban and rural areas (Fu et al. 2024), with educational institutions increasingly expected to integrate technology into their operations (Haleem et al. 2022). In Indonesia, for instance, the city of Pariaman has experienced notable population growth, yet it lags in adopting digital technologies, particularly in its educational sector (Aminurrohman and Firdonsyah 2021). This digital divide is especially pronounced in privately managed schools, which often serve underprivileged communities and orphans. These institutions face significant challenges in maintaining operational efficiency and achieving modern educational standards due to limited resources and technological support.

This raises concerns about whether existing digital tools—such as the Sistem Informasi Sekolah Alam (SIFOSA)—can be effectively utilized by users with limited digital proficiency. One such institution is Yayasan Darul Furqan in Desa Air Santok, Pariaman, which operates a nature school, an IT school, and a pesantren. In response to these challenges, the foundation implemented SIFOSA to streamline administrative and educational processes. Although the system aligns with the school's vision of delivering quality education in accordance with Sustainable Development Goal 4 (SDG 4), its usability remains uncertain given the users' low technological literacy, including teachers, administrators, and students in rural settings. The display of the SIFOSA application is illustrated in Figure 1 below:

FIGURE 1. SIFOSA home display

Evaluating user experience is essential, especially since the success of any information system depends heavily on its usability (Pratama et al. 2021). Poor usability can hinder user engagement, limit adoption, and reduce the system's overall effectiveness. Therefore, evaluating the usability of SIFOSA is necessary to ensure that the system is not only functional, but also accessible and intuitive for its target users (Priyadarshini 2024).

Despite the implementation of SIFOSA, no formal usability evaluation has been conducted to determine whether the system meets the needs of its intended users. Therefore, this study aims to evaluate the usability of SIFOSA using the System Usability Scale (SUS) method, with a focus on the rural education context of Desa Air Santok. SUS is selected for its efficiency, reliability, and ease of use (Pratama and Cahyadi 2020) (Kureerung et al. 2022) (Kruger et al. 2022). The findings of this study are expected to support the development of more effective digital systems in rural schools and provide a replicable model for similar educational environments across the Pariaman region. This study is also aligned with the United Nations Sustainable Development Goal 4 (SDG 4): Quality Education, which emphasizes inclusive and equitable access to education through digital innovation. By evaluating the usability of SIFOSA in a rural school context, this research supports efforts to improve digital literacy, reduce the education technology gap, and enhance learning infrastructure in underrepresented communities.

RELATED WORK

School Information Systems (SIS) have become an essential component in modern education management. These systems are designed to handle various administrative functions, such as student registration, attendance recording, grade management, and communication between teachers, students, and parents (Nugroho et al. 2022) A study by Ali et al. (2021) showed that the implementation of SIS significantly improved the operational efficiency of schools and encouraged collaboration between stakeholders. However, the adoption of SIS in rural schools still faces obstacles, such as limited infrastructure and technical expertise (Haidar et al. 2023). Schools in remote areas often have difficulty in maximizing the potential of SIS due to lack of training and supporting resources (Grave and Buchner 2024). This emphasizes the need to develop school information systems that are not only functional, but also easy to use and appropriate to the context of local users.

User Experience (UX) reflects the overall perception and response of users to a digital system, including factors such as comfort, ease of navigation, and satisfaction with use (Ley et al. 2022) Several studies emphasize that good user experience is highly dependent on a deep understanding of user needs and expectations (Ali et al. 2021). According to Priyadarshini (2024), a well-designed interface can increase user engagement and support educational goals. Therefore, the UX approach is becoming increasingly important in the development of educational systems, especially when users have limitations in digital literacy.

Usability is a key dimension in assessing the success of a digital system. Applications with a high level of usability usually show efficiency, effectiveness, and good levels of user satisfaction (Zhao and Guo 2022). Usability evaluation can help identify obstacles in system use and provide a basis for improvement. The System Usability Scale (SUS) method is one of the most commonly used approaches in usability measurement because of its simplicity and validity for various types of applications (Mayer et al. 2021) (Zaindanu and Ihsan 2021). A

study by Hyzy et al. (2022) stated that SUS is effective for evaluating applications in various contexts, including education and public services.

This study adopts a similar approach with the aim of examining how the usability of the SIFOSA system is perceived by users from rural backgrounds with low levels of technological literacy. Thus, this study not only extends the application of the SUS method but also adds a local context that has been under-researched in the literature.

METHODOLOGY

When performing Usability Evaluation research on SIFOSA, using the System Usability Scale Method with stages that can be seen at Figure 2.

FIGURE 2. Research flow

Preliminary research involved three main activities: (1) conducting a literature review to understand usability evaluation methods—particularly the System Usability Scale (SUS); (2) formulating research problems based on the implementation of SIFOSA in a rural education setting; and (3) determining an appropriate data collection and analysis approach.

Data were collected using a structured online questionnaire distributed via Google Forms. The survey instrument employed the standard SUS format comprising 10 items with a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). Respondents were selected using a simple random sampling technique and consisted of 41 participants, including teachers, students, and school administrative staff who use the SIFOSA system. The inclusion criterion was having prior experience with using SIFOSA in daily school operations.

SUS scores were calculated by first converting individual item responses into raw scores, following standard SUS procedures: for positive items, 1 was subtracted from the response, and for negative items, the response was subtracted from 5. The total raw score was then multiplied by 2.5 to yield a normalized score ranging from 0 to 100. These scores were then interpreted using standard SUS classification guidelines, which categorize scores into levels such as:

- Poor (<50)
- Average (50–70)
- Good (70–85)
- Excellent (>85)

Based on the analysis, conclusions were drawn regarding the overall usability of the SIFOSA system. The findings were used to determine the system's strengths and identify potential areas for improvement. These insights are expected to inform future enhancements to SIFOSA and guide similar digital implementations in rural education settings.

A. System Usability Scale (SUS)

SUS is used with the aim of measuring the subjectivity of user perceptions regarding the usability of a system and allowing such assessments to be made quickly (Suria 2024). This approach provides 10 questions, each offering 5 graded response options on a 1 to 5 scale, with 1 indicating strong disagreement and 5 indicating strong agreement. The questions are balanced between positive and negative with results ranging from 1-100 (Hyzy et al. 2022).

TABLE 1. List of SUS survey items

No	Question
1	I believe I will utilize this system once more.
2	I perceive this system as being difficult to operate.
3	I consider this system to be user-friendly.
4	I require assistance from others or technicians to navigate through this system effectively.
5	I believe the functionalities of this system are functioning as intended.
6	I perceive a significant amount of inconsistency or incompatibility with this system.
7	I have a hunch that others will grasp the usage of this system swiftly.
8	I am finding this system to be perplexing.
9	I sense that there are no hindrances in utilizing this system.
10	I must familiarize myself with it before I can effectively use this system.

The calculation of the SUS score is done by summing up all the numbers obtained from the respondents and dividing by the number of respondents to get the average result. The interpretation of the SUS score consists of 5 elements, namely:

1. Percentiles

According to Damayanti and Ali (2023) percentiles refers to the relative position of SUS scores in a wider score distribution. The SUS percentile shows how well the system is rated by users compared to other systems. For example, if an app's SUS score is in the 85th percentile, this means that 85% of the other systems evaluated have a lower score, indicating that the app has a relatively high usability.

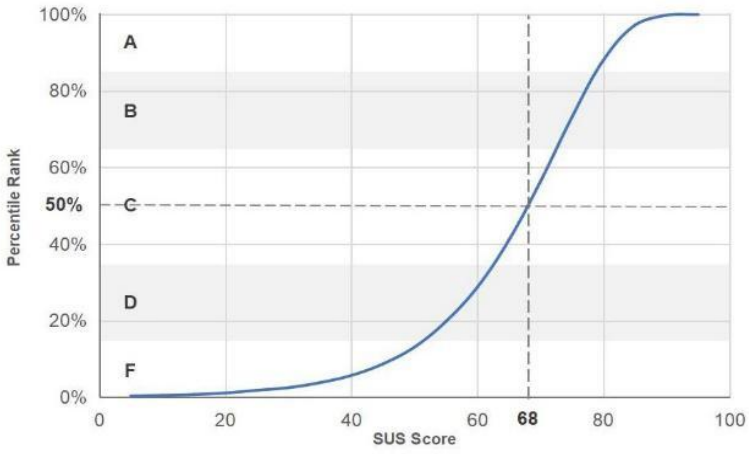

FIGURE 3. SUS results plotted on a curve

2. Grades

On the SUS scoring scale, the unadjusted score is classified within a grading system from A to F, where A signifies outstanding performance and F denotes extremely weak performance.

3. Adjective
A score of SUS exceeding 85 is considered Very Good, whereas a score exceeding 72 is considered Good and a score exceeding 51 is considered Ok.

4. Acceptability
Scores exceeding 70 indicate 'Acceptable' usability, while those below 50 are deemed 'Unacceptable.' Scores ranging from 50 to 70 fall into the 'Marginally Acceptable' category, corresponding to a C or D grade.

B. Interpreting SUS Scores
Interpretation of SUS scores can be achieved by comparing percentile ranks, numerical values, descriptive adjectives, acceptance levels, and the score's promoter rating. Fig. 4 provides a visual representation of this interpretive scale

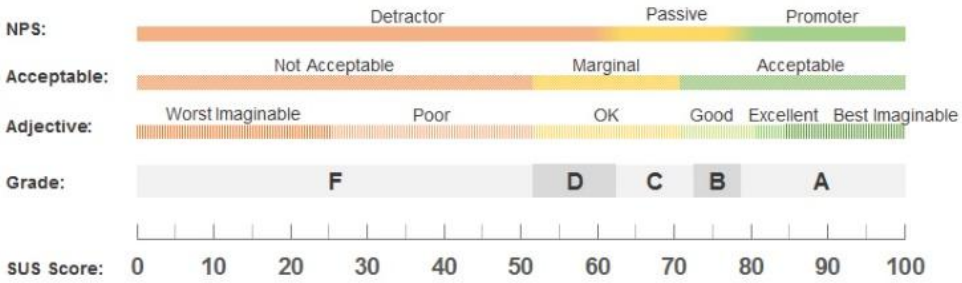

FIGURE 4. SUS score

RESULT AND DISCUSSION

A. Analysis of System Usability Scale (SUS) Questionnaire Results
The data were collected using a simple random sampling technique. Among the 41 respondents include teachers, students and school administration, who have roles as users and interact with SIFOSA application.

TABLE 2. Demographic profile of respondents

Gender	Frequency	Percentage
Female	26	64.3%
Male	15	36.6%

Several questions asked in the questionnaire are related to the respondent profile which will be classified based on gender and occupation with the frequency of use of application features and have been filled in by 41 respondents.

TABLE 3. Calculated normalization score

No	Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Ammount (Value x 2.5)
1	R1	1	6	0	6	4	6	0	5	1	3	32	80
2	R2	0	6	0	6	3	6	0	6	0	4	31	77,5
3	R3	0	6	0	6	4	4	0	6	0	4	30	75
4	R4	0	6	0	5	4	6	0	6	0	4	31	77,5
5	R5	0	6	0	6	2	6	0	6	0	4	30	75
6	R6	2	6	2	6	4	5	2	4	2	2	35	87,5

7	R7	0	6	0	6	2	6	0	6	0	4	30	75
8	R8	0	6	0	6	4	6	0	6	1	3	32	80
9	R9	1	6	1	6	2	5	1	5	1	2	30	75
10	R10	0	6	0	6	4	6	0	6	0	4	32	80
…	…	…	…	…	…	…	…	…	…	…	…	…	…
41	R41	0	6	0	5	3	6	0	6	0	4	30	75
Average Score (Final Result)													78,5

According to Table 3, the total column consists of the values collected in columns Q1 through Q10. The values in this column are obtained by taking the total and multiplying it by 2.5, and the overall mean of the values is 78.5. This data is openly accessible at zenodo with the link https://zenodo.org/records/15863368

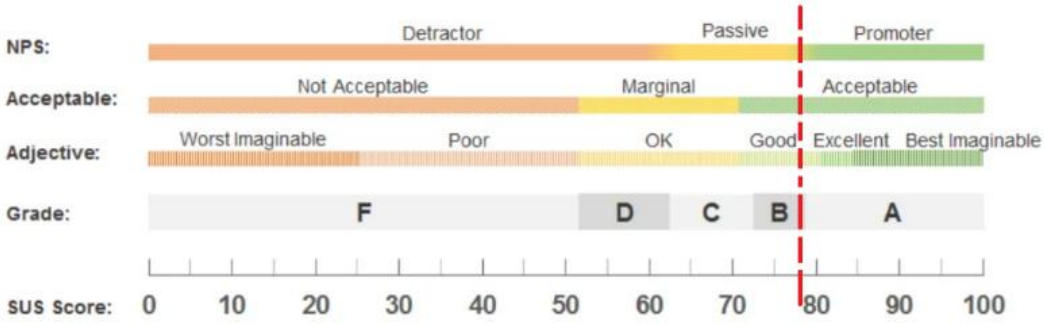

FIGURE 5. Interpretation of SUS scores applied to the SIFOSA system

According to individual usability analysis outcomes for each participant, the application was rated as having good usability, with a SUS score of 78.5, or a Grade B, the SIFOSA application demonstrates good quality.

TABLE 4. Interpretation of the SUS score in the SIFOSA

Grade	*SUS*	*Percentile Range*	*Adjective Rating*	*Acceptability*
B	78.5	70-80%	Good	Acceptable

Table 3 explains in more detail the application of SIFOSA from user perspective of usability. The analysis yielded an average SUS score of 78.5, which places SIFOSA in the “Good” usability category (Grade B). According to SUS benchmarks, this score falls within the 70–80% percentile, indicating that the system performs better than most comparable systems. It also reflects general user satisfaction, ease of use, and acceptability.

SUS provides a subjective interpretation based on numbers, and in this case, a score of 78.5 means that the system is rated as "Good". Users find the system quite intuitive and easy to use, but there is still room for further improvement in terms of simplicity, speed of interaction, or other elements of usability.

This score also indicates that the system or application being tested is acceptable as a whole by the user. Users generally do not have significant difficulty in using the system, and they may be willing to recommend or use the system again in the future. This shows that usability is not a major obstacle to the adoption of this technology. Especially for some of the things below:

1. Speed of interaction: Users feel the system is responsive.
2. Simplicity of navigation: Users feel intuitive with the navigation contained in SIFOSA.
3. Display consistency: The interface aspect of SIFOSA has been quite consistent.

CONCLUSION

The System Usability Scale (SUS) evaluation of the Nature School Information System (SIFOSA) has demonstrated the efficacy of this method is very suitable in assessing the usability or usefulness of this information system. SUS is a method that has been shown to be effective in evaluating various aspects of an application's usability through user responses to 10 standard questions that include effectiveness, efficiency, and user satisfaction.

With a SUS score of 78.5, SIFOSA is categorized as "Good" and is above the average standard of application usability. This score reflects that the majority of users feel comfortable and do not encounter major obstacles when using this system. From the perspective of acceptability, this system is also considered acceptable, which shows that this application is reliable to be widely used by various groups of users, both school managers and other users involved in the education system.

Future development of SIFOSA should focus on simplifying key features and integrating user feedback to enhance engagement. Additionally, further research is recommended to explore longitudinal usability trends and assess the system's impact on digital literacy and learning outcomes over time. In broader terms, this work contributes to SDG 4 by promoting the use of accessible and user-friendly educational platforms in underserved areas. Ensuring the usability of such systems can empower schools to improve learning processes, bridge digital inequality, and foster long-term educational sustainability.

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