

## Elementary School Teachers' Acceptance of Website-Based Multimodal Media: A SUS Analysis

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**Abstract.** The rapid advancement of educational technology has introduced various innovations, yet the acceptance and readiness of elementary school teachers to adopt AI-based learning media remain inconsistent. Limited pedagogical understanding and diverse levels of technological literacy continue to hinder effective integration. This study examines teachers' acceptance of a website-based multimodal learning medium developed through a deep learning approach. The medium integrates text, images, audio, and video within an adaptive web-based system designed to enhance students' learning experiences. A quantitative survey method was employed, utilizing the System Usability Scale (SUS) questionnaire administered to 80 elementary school teachers in Bandung Regency, Indonesia. The findings revealed an average SUS score of 78, classified as "good" and approaching the "widely accepted" level. Respondents perceived the medium as effective, engaging, and aligned with twenty-first-century learning competencies. Overall, the results demonstrate that the application of deep learning in designing adaptive multimodal learning environments holds significant promise for broader adoption in elementary education contexts.

**Keywords:** Teacher acceptance; Multimodal media; Website; Deep learning; System Usability Scale (SUS)

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### INTRODUCTION

This transformation brings not only opportunities but also challenges that require collaboration, innovation, and engaging learning experiences. Understanding the implications of digital transformation in education is crucial to address the rapid pace of technological change. In an era that continues to transform rapidly, education cannot avoid the impact of the digital revolution affecting all aspects of life (Nashrullah et al., 2025). Over recent decades, technological innovations have revolutionized the way we access information, understand culture, and engage in the learning process. The shift from conventional education systems toward the utilization of digital technology has brought significant impact and substantial opportunities in shaping the new face of education globally (Sindi Septia Hasnida et al., 2023)

One key indicator of this change is the increased ease of accessing information. As internet connectivity continues to expand, both students and educators can now access diverse learning materials quickly. Learning is no longer confined by geographical location or rigid curricular structures; instead, the entire world has become a learning space for anyone willing to explore it. (Gesang Wahyudi & Kata Kunci, 2024). However, this transformation is not limited merely to ease of access. The digital era also introduces new approaches in teaching strategies. The use of technologies such as educational applications, interactive simulations,

and learning games paves the way for a more engaging and effective learning process. Learning methods that were once unidirectional and passive have now evolved into interactive and participatory approaches, enabling learners to engage more actively in understanding complex subject matter (Miranda Ester Nababan & Martin Juventus Hutapea, 2024). By examining the effectiveness of various media in enhancing student engagement, comprehension, and critical thinking skills, this review highlights the potential of innovative learning media in supporting educational objectives. (Kasmawati et al., 2025).

Advancements in digital technology impact not only the methods of delivering instructional content but also have deeper implications for the attainment of educational objectives. Within the context of 21st-century education, the primary goal is no longer merely the transfer of knowledge but rather the development of competencies in critical thinking, creativity, collaboration, and communication, the four core pillars of the Framework for 21st Century Learning developed by P21 (Partnership for 21st Century Skills). Technology plays a strategic role in reinforcing these achievements by creating adaptive and responsive learning environments that address the individual needs of learners. (Aisa & Thoriquil Aziz, 2025) Amid the wave of digitalization, technology enables the learning process to occur in a more contextual and meaningful manner through the integration of diverse learning resources, real-time feedback, and flexibility in selecting learning styles that align with learners' characteristics. This approach aligns with the principles of student-centered learning, which positions students as active participants in the educational process. This approach encourages students not only to receive information passively but also to actively construct their own understanding through exploration, reflection, and dynamic interaction within digital environments. (Prasakti et al., 2024)

Furthermore, the use of technology supports the realization of personalized learning, enabling teachers to design instruction based on students' needs, interests, and readiness levels (Di et al., 2023). In this context, technology does not replace the teacher's role but rather expands their capacity as a learning facilitator who can leverage data and analysis to guide pedagogical interventions with greater precision. This provides space for deeper, more authentic, and more relevant learning experiences aligned with real-life contexts (Panjaitan & Hafizzah, 2025). Thus, the integration of technology in education is not merely about digitizing instructional materials but constitutes a strategic effort to create a learning system capable of fostering deep learning, that is, the ability to understand concepts, transfer knowledge to new situations, and solve complex problems. Within this framework, technology becomes an essential instrument in advancing transformative education, education that not only teaches "what" to

know but also “how” to think and “why” it matters for living meaningfully in a global society. (Suwandi et al., 2024)

The deep learning approach emphasizes strengthening deep conceptual understanding of subject matter through learning experiences that are emotionally and cognitively integrated. In this approach, students are encouraged to engage actively and meaningfully in their learning process. The aim is to replace traditional learning models, which typically focus on memorization and repetition of information, with a more reflective and constructive pattern of learning. In this context, the concept of mindful learning developed by (Ragoonaden, 2015) becomes relevant, as it encourages students not only to understand academic content but also to connect it with their personal experiences and everyday realities. In Indonesia, the implementation of the deep learning approach aligns with the values promoted in the Merdeka Curriculum, which emphasizes freedom in the learning process and project-based instruction. This curriculum provides learners with the flexibility to explore subject matter in a contextual and in-depth manner, according to their individual interests and potential (Prasetyo, 2024). Therefore, the deep learning approach, which emphasizes active engagement, meaningful understanding, and reflective awareness in the learning process, is highly relevant for implementation within the national education system.

In the context of modern education, the use of instructional media is no longer limited to the mere verbal or textual delivery of information. One approach now widely adopted to enhance learning effectiveness is the multimodality approach. According to (Yunus Abidin, 2022), multimodal learning is an instructional strategy that integrates various modes of communication simultaneously, such as text, visuals, audio, bodily movement, and spatial elements, to support a more comprehensive understanding of the subject matter. (Mufaridah et al., 2025), state that presenting content through multiple communication channels can provide a more inclusive and meaningful learning experience. For instance, instruction that combines visual and auditory elements can enhance students’ comprehension and retention of abstract concepts. Meanwhile, the use of gestures and visual-spatial arrangement can assist students in understanding relationships among concepts and in developing critical and creative thinking skills. Furthermore, (Layn et al., 2025) emphasize that multimodal learning media are highly effective in creating participatory and contextual learning experiences. Through this approach, teachers no longer serve merely as information providers but also as facilitators who guide interactions among modalities to achieve deep understanding. This aligns with the spirit of the Merdeka Curriculum, which grants learners the freedom to learn according to their individual styles and potentials.

Websites can be designed to accommodate multimodal content, such as infographics for visual understanding, podcasts for auditory engagement, tutorial videos combining visual and audio elements, and discussion forums or comment sections as spaces for interaction and reflection (Janfada et al., 2025). The capacity of websites to integrate all these modes makes them an ideal medium for delivering in-depth and contextual learning experiences. Moreover, features such as interactive navigation and user management systems enable teachers to tailor instruction to individual student needs, in accordance with the principles of differentiated learning in the Merdeka Curriculum. (Jurnal et al., 2024). In addition, the use of websites as multimodal media promotes self-directed learning, as students are given the freedom to explore content at their own pace and according to their interests. In this context, teachers serve as content designers and facilitators who guide learners in meaningfully connecting information across different modalities. Thus, the integration of multimodal learning through websites not only supports comprehensive mastery of subject matter but also develops digital skills, critical thinking, and information literacy, all of which are essential for life in the 21st century. (Gusdini et al., 2025)

To ensure that technology-based learning media can be used effectively by teachers and students, evaluation of usability aspects becomes essential. The System Usability Scale (SUS) is a straightforward yet effective measurement tool for assessing users' perceptions of the ease of use of a system or product (Zahra et al., 2021). By using the SUS, developers and educators can gain insights into the strengths and weaknesses of the developed learning media and implement necessary improvements to enhance user experience. Although numerous studies have addressed the use of technology in education, research specifically examining elementary school teachers' acceptance of website-based multimodal learning media within a deep learning approach remains limited. Moreover, usability evaluations of such media from the perspective of teachers as primary users have not been widely conducted. Therefore, in-depth research is needed to understand the factors influencing teacher acceptance and to evaluate the effectiveness and usability of the developed learning media. Against this background, this study aims to analyze elementary school teachers' acceptance of website-based multimodal learning media within a deep learning approach and to evaluate the usability of the media using the System Usability Scale (SUS).

Several previous studies have examined the use of web-based technology and learning media, particularly in terms of acceptability and ease of use. (Yang et al., 2023) investigated elementary school teachers' acceptance of web-based multimodal learning media using the UTAUT2 model. The results showed that perceived ease of use and perceived usefulness

significantly influenced teachers' acceptance levels. However, the study did not explore in depth the usability aspects of the media used. Another study by (Rostika et al., 2025) evaluated the usability of digital learning media developed with Google Sites using the System Usability Scale (SUS). The findings indicated that the media was relatively easy to use and achieved a good level of user satisfaction, although some interface aspects still required improvement. Similarly, (Al Shabibi, 2025) assessed teachers' perceptions of using Google Classroom based on SUS. The average SUS score obtained was 69.2, which falls within the "good" category. These findings suggest that teachers felt fairly comfortable using digital learning platforms. In addition, a study conducted by several researchers in Slovenia (Žerovnik, 2024) evaluated a technology-based feedback system involving more than three thousand teachers. The study employed both SUS and the Technology Acceptance Model (TAM) to assess the system's usability and acceptance among teachers. The results showed that combining usability and acceptance evaluations could provide a more comprehensive understanding of the effectiveness of digital learning systems.

From these studies, it can be concluded that research on the usability of web-based learning media has been extensively conducted. However, most of these studies focus on general contexts or secondary education levels. Few studies have specifically examined elementary school teachers' acceptance of web-based multimodal learning media while simultaneously assessing its usability using the SUS. Moreover, the application of deep learning approaches in the development and evaluation of learning media remains limited. Therefore, this study offers novelty in two main aspects. First, it combines the analysis of elementary school teachers' acceptance of web-based multimodal learning media with usability evaluation using SUS. Second, it situates the media within a deep learning-based instructional approach, which is expected to provide more interactive and meaningful learning experiences for both teachers and students.

This novelty also underscores the importance of developing learning media that are not only multimodal and interactive but also contextualized to real-world issues relevant to students' lives. In response to this need, the present study developed Website EcoKids, a digital learning medium focusing on fostering environmental awareness through enjoyable and meaningful learning experiences. The findings of this study are expected to contribute to the development of effective and teacher-accepted learning media, while also supporting the implementation of deep and meaningful learning at the elementary education level.

## METHODOLOGY

This study employs a quantitative approach using a survey method to measure the level of acceptance among elementary school teachers toward website-based multimodal learning media developed through a deep learning approach. The primary focus of the research is to evaluate the usability of the media based on teachers' perceptions as end users. The System Usability Scale (SUS) method is the technique used to assess the extent to which a system or application can be used effectively and efficiently by its users (Sanjaya et al., 2021). This approach provides a comprehensive overview of users' perceptions regarding the level of comfort and ease in using the system under evaluation. The SUS method was first developed by John Brooke in 1986 at Digital Equipment Corporation, England (Brooke, 2013).

### 1. Participants

The participants were 80 elementary school teachers from Bandung Regency, Indonesia, selected using a purposive sampling technique. The selection criteria included teachers who had previously used digital media in teaching and were willing to participate voluntarily. All participants were active classroom teachers representing various grade levels.

Populasi target awal penelitian ini terdiri dari guru-guru sekolah dasar di Kabupaten Bandung, Indonesia, yang secara aktif mengajar di bawah Kurikulum Merdeka dan memiliki pengalaman sebelumnya menggunakan media pembelajaran digital atau berbasis web. Populasi ini dipilih karena guru pada tingkat ini terlibat langsung dalam penerapan inovasi pembelajaran yang didukung teknologi dan memainkan peran penting dalam mengevaluasi kegunaan media pendidikan baru. Dari populasi ini, 80 guru dipilih sebagai responden menggunakan purposive sampling. Kerangka purposive sampling dibangun berdasarkan kriteria inklusi tertentu: (1) guru yang saat ini mengajar di sekolah dasar negeri atau swasta di Kabupaten Bandung; (2) memiliki setidaknya dua tahun pengalaman mengajar; (3) memiliki keterampilan literasi digital dasar; dan (4) telah berpartisipasi dalam kegiatan atau pelatihan pembelajaran terintegrasi teknologi. Kriteria ini memastikan bahwa peserta memiliki pengalaman yang relevan untuk memberikan evaluasi yang terinformasi tentang media pembelajaran multimoda berbasis situs web yang dikembangkan. Rasional metodologis untuk memilih purposive sampling terletak pada kesesuaiannya untuk mengidentifikasi kasus-kasus yang kaya informasi dalam

penelitian teknologi pendidikan, di mana responden dipilih secara sengaja untuk keahlian dan relevansi kontekstual mereka. Jumlah 80 responden ditentukan berdasarkan pertimbangan kelayakan, representasi konteks sekolah yang beragam di Kabupaten Bandung, dan keselarasan dengan studi kegunaan sebelumnya yang menggunakan Skala Kegunaan Sistem (SUS), yang biasanya melibatkan 50-100 peserta untuk menghasilkan hasil yang dapat diandalkan secara statistik.

## 2. Instrument

The primary data collection instrument was the System Usability Scale (SUS) questionnaire, consisting of 10 items on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The questionnaire measured five dimensions of usability: satisfaction, ease of use, consistency, learnability, and efficiency.

Each item alternated between positive and negative statements to minimize response bias. Example items include:

“I intend to use this web-based multimodal digital media again.” (Positive)

“I find this web-based multimodal digital media difficult to use.” (Negative).

The System Usability Scale (SUS) method was applied to evaluate the level of usability of the web-based multimodality learning media developed through a deep learning approach. SUS was used as a measurement tool to capture elementary school teachers’ perceptions of the media’s usability aspects. Through this instrument, the researcher was able to obtain a comprehensive overview of how well the media supported comfort, ease of navigation, and effectiveness in the learning process. The list of statements in the SUS questionnaire used to measure users’ (teachers’) opinions on the ease of use of the learning media, along with the indicators and variables, is presented in Table 1.

Table 1. Indicators and Variables in the Questionnaire

No	Variables	Indicators	Type	Symbol
1	Satisfaction	I intend to use this web-based multimodal digital media again.	Positive	P1
2		I find this web-based multimodal digital media difficult to use.	Negative	P2

3		I find this web-based multimodal digital media easy to use.	Positive	P3
4	Ease of use	I need assistance from another person or technician to use this web-based multimodal digital media.	Negative	P4
5		I feel that the features of this web-based multimodal digital media function as they should.	Positive	P5
6	Consistency	I feel that there are many inconsistencies in this web-based multimodal digital media.	Negative	P6
7		I believe other people would quickly understand how to use this web-based multimodal digital media.	Positive	P7
8	Learnability	I find this web-based multimodal digital media too complicated to use.	Negative	P8
9		I feel there are no obstacles or difficulties in using this web-based multimodal digital media .	Positive	P9
10	Efficiency	I need to familiarize myself further before using this web-based multimodal digital media .	Negative	P10

Each response provided by respondents will be calculated using the System Usability Scale (SUS) formula. The assessment employs a Likert scale, in which each response category carries a specific weight. The scoring scheme for each Likert scale option is explained as follows. The SUS assessment scale can be seen in Table 2.

Table 2. Likert Scores in the SUS Questionnaire

Likert Scale Scoring Table	
Response	Score
Strongly Disagree (SD)	1
Disagree (D)	2
Neutral (N)	3
Agree (A)	4
Strongly Agree (SA)	5

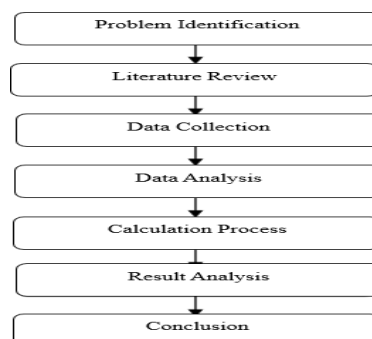
The next stage of the data analysis method is carried out by processing the results of the questionnaires completed by the respondents. The collected data are systematically organized and analyzed using the System Usability Scale (SUS) calculation guidelines. The System Usability Scale (SUS) is one of the methods designed to evaluate the usability of a software application or user-based system under real usage conditions. This method was first developed by John Brooke in 1986 and remains widely regarded as one of the simplest, most efficient, and most reliable usability measurement instruments. The primary purposes of using the SUS are:

- a. To provide a subjective overview from users regarding the ease of use of a system;
- b. To enable the evaluation process to be conducted in a relatively short time while maintaining accuracy.

As a rapid evaluation tool, SUS enables researchers to measure user experience across various digital products, including software, websites, mobile applications, and other service-based systems. This instrument is highly practical because it can be applied with a small sample size, within an efficient timeframe, and at minimal cost (Brooke, 2013)

### 3. Procedure

The research process was carried out in several stages: Preparation formulation of research problems, literature review, and determination of research objectives. Media Development and Testing the EcoKids website was developed based on multimodal and deep learning principles and then demonstrated to participants. Data Collection teachers used the website and then completed the SUS questionnaire through an online form. Data Verification responses were screened for completeness before data processing.



**Figure 1. Research Stages**

As an implementation of this approach, the research was carried out through a series of

systematic stages, as illustrated in Figure 1 below. This study begins with problem formulation based on field observations, followed by a literature review to strengthen the theoretical foundation. The researcher establishes the research objectives and questions, then designs the study using a descriptive quantitative approach. The sample is selected through purposive sampling, and the instrument used is the System Usability Scale (SUS) questionnaire. After the media is tested by respondents, data are collected and analyzed quantitatively to assess teachers' acceptance of the media. The process concludes with interpretation of the results, drawing conclusions, and formulating recommendations.

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#### 4. Data Analysis

The data collection process was conducted over a three-week period, from June 10 to June 30, 2025. During this period, the System Usability Scale (SUS) questionnaire was distributed to 100 elementary school teachers in Bandung Regency through online and offline channels, including professional teacher communities and school networks. A total of 80 valid responses were received and analyzed, resulting in a response rate of 80%, which is considered adequate for survey-based usability studies.

Bandung Regency, located in West Java Province, Indonesia, is one of the largest administrative regions surrounding the city of Bandung, encompassing both urban and rural areas. The regency has 31 districts (kecamatan) and over 280 public and private elementary schools, representing diverse socio-economic and educational backgrounds. The region's strong commitment to implementing digital-based and Merdeka Curriculum-aligned learning initiatives makes it a relevant context for examining teachers' acceptance of website-based multimodal media. The selected respondents came from various schools in Cileunyi, Soreang, Baleendah, and Ciparay districts, reflecting a balanced demographic distribution of gender, teaching experience, and school type.

After obtaining respondent data, the data are processed to yield a score ranging from 0 to 100. The System Usability Scale (SUS) method follows specific rules for calculating the SUS score. The following are the rules applied in scoring the questionnaire:

- a. For each odd-numbered item, subtract 1 from the respondent's score.
- b. For each even-numbered item, subtract the respondent's score from 5.
- c. The SUS score is calculated by summing the adjusted scores of all items and then multiplying the total by 2.5.

$$SUS\ score = ((x_1 - 1) + (5 - x_2) + (x_3 - 1) + (5 - x_4) + (x_5 - 1) + (5 - x_6) + (x_7 - 1) + (5 - x_8) + (x_9 - 1) + (5 - x_{10})) * 2,5 \quad (1)$$

Explanation:  $x$  = Statement

The next step is to sum the scores obtained from each respondent, then divide the total by the number of respondents to obtain the average score. Below is the formula for calculating the SUS score:

$$Mean = \frac{\sum_{i=1}^n xi}{N} \quad (2)$$

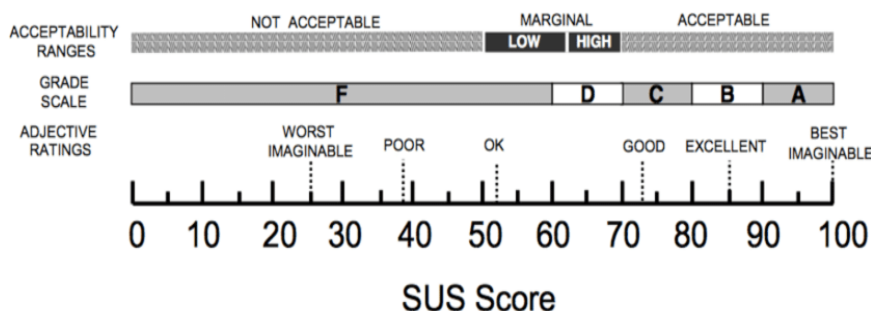
Explanation:

$xi$  = Total score of respondent

$N$  = Total number of respondents

After the values are collected and processed, the System Usability Scale (SUS) will provide a score which is then classified based on the rating and grade according to the total score. The interpretation of SUS scores is shown in Figure 2

Figure 2. SUS Score Interpretation (A. Bangor, et al., 2009)



<i>Grade Scale</i>	<i>Adjective Ratings</i>	<i>Acceptability Range</i>
A: 91 – 100	<i>Best Imaginable: 85 – 100</i>	<i>Not Acceptable: 0 – 50</i>
B: 81 – 89	<i>Excellent: 74 – 85</i>	<i>Marginal: 50 – 70</i>
C: 71 – 80	<i>Good: 53 – 74</i>	<i>Acceptable: 70 – 100</i>
D: 61 – 70	<i>Ok: 39 – 53</i>	
F: 0 – 60	<i>Poor: 25 – 39</i>	
	<i>Worst Imaginable: 0 – 25.</i>	

**Table 3. Explanation of SUS Scores**

The classification explanation of SUS scores is presented in Table 3. Of the three aspects of the System Usability Scale (SUS) evaluation explained in Table 3 above, user acceptance of the digital media software is measured using acceptability, the quality or level of the website is assessed using the grade scale, and adjective ratings are employed to describe the overall quality of the website.

### 5. Ethical Considerations

This study complied with research ethics in educational settings. Participants were informed of the study’s objectives and procedures and provided informed consent prior to participation. Data were collected anonymously, ensuring confidentiality and voluntary participation. The study posed no potential risks to participants and was conducted in alignment with institutional ethical guidelines for educational research.

## RESULTS AND DISCUSSION

This study focuses on evaluating teachers’ acceptance of website-based multimodal learning media developed within a deep learning approach. Data collection was conducted by distributing the System Usability Scale (SUS) questionnaire to elementary school teachers as the primary respondents. After all questionnaires were distributed and returned, the collected data were processed and prepared for analysis to gain a deeper understanding of the usability level of the developed media.

Based on the data collection results, the SUS questionnaire was administered to 80 elementary school teachers teaching in schools across Bandung Regency. The following presents the findings from the respondents’ answer recapitulation regarding the usability evaluation of the media in the provided questionnaire. These findings serve as a crucial basis for measuring the effectiveness, comfort, and ease of use of the website-based media in supporting the learning process. Table 4 presents the results of the recapitulation of respondents’ answers to all SUS questionnaire items, as a basis for calculating the final score.

**Table 4. Respondents' Answer Recapitulation**

No	Statements	Responses				
		1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)
1	I intend to use this web-based multimodal digital media again.	0	0	5	32	43
2	I find this web-based multimodal digital media difficult to use.	38	35	6	1	0
3	I find this web-based multimodal digital media easy to use.	0	0	5	35	40
4	I need assistance from another person or technician to use this web-based multimodal digital media.	30	26	11	7	6
5	I feel that the features of this web-based multimodal digital media function as they should.	1	0	5	35	39
6	I feel that there are many inconsistencies in this web-based multimodal digital media.	39	25	10	4	2
7	I believe other people would quickly understand how to use this web-based multimodal digital media.	1	0	7	40	32
8	I find this web-based multimodal digital media too complicated to use.	41	23	10	5	1
9	I feel there are no obstacles or difficulties in using this web-based multimodal digital media.	4	5	6	32	33
10	I need to familiarize myself further before using this web-based multimodal digital media.	20	16	10	23	11
<b>Total</b>		174	130	75	214	207
<b>Percentages (%)</b>		22%	16%	9%	27%	26%

Table 4 presents the results of the questionnaire completed by respondents. Specifically, 22% of respondents selected “Strongly Disagree”, 16% selected “Disagree”, 9% selected “Neutral”, 27% selected “Agree”, and 26% selected “Strongly Agree”. The sum of these percentages equals 100%.

After the respondent data were collected, the next step was to calculate the System Usability Scale (SUS) score using equations (1) and (2). The calculation was performed for each respondent, then summed to obtain the total overall score and the average SUS score. Based on the data analysis results, the total SUS score obtained was 6,280.00 from 80 respondents, resulting in an average SUS score of 78.50. According to the interpretation by (Bangor et al., 2009) a score of 78.50 falls into the “Acceptable” category and is classified as having “Good Usability.” These findings

indicate that the web-based multimodal digital media was perceived as highly acceptable among users. The media was considered easy to use, efficient, and enjoyable in supporting the learning process. Therefore, in terms of usability, the media has met the functional and interactive feasibility criteria for use in digital learning contexts.

In the research conducted by (Bangor et al., 2009) on the System Usability Scale (SUS), an adjective rating scale was included to interpret the obtained SUS scores. The purpose of this scale is to assist practitioners in interpreting SUS results and communicating them effectively to professionals outside the field of Human-Computer Interaction (HCI). This is emphasized by (Maryati et al., 2022) The level of usability has an important role in the sustainability of a system. In the context of this research, the results of usability measurements can be used as initial data in the system revitalization process. One method commonly used to assess usability is the System Usability Scale (SUS).

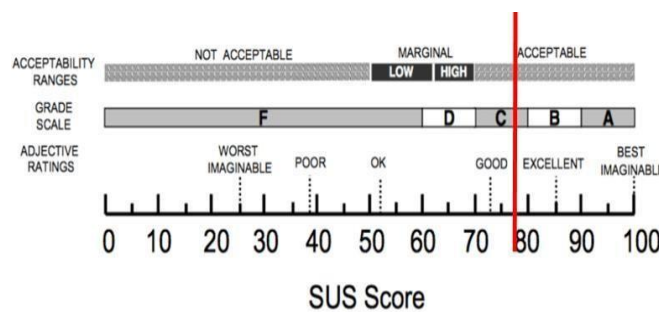


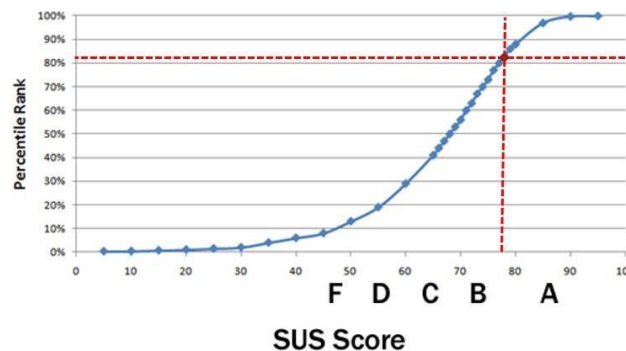
Figure 3. SUS Score

The results of the System Usability Scale (SUS) score calculation are visualized in Figure 3, which shows the average value of user evaluation results of the media being developed. Based on the SUS calculation, the website-based multimodal media developed within the deep learning approach obtained a score of 78.50, which corresponds to a grade of “C”. Subsequently, the SUS score was converted into adjective ratings and acceptability ranges. To enhance interpretability, a set of adjectives is used to describe the level of usability, while the acceptability range indicates the degree of user acceptance of the website (Lewis, 2018) the adjective rating perspective, the website-based multimodal media developed within the deep

learning approach was rated as “Excellent”, while in terms of acceptability level, it was classified as “Acceptable” or deemed acceptable for use.

(Lewis Senior HF Engineer & Sauro, 2017) also describes SUS scores using a percentile ranking and letter-grade scale. This approach functions similarly to evaluating a performance curve based on distribution, taking all factors into account. According to Figure 3, the website-based multimodal media developed within the deep learning approach received a letter grade of C, with a percentile rank of approximately 82 percent. A percentile ranking can be likened to a recommendation score, indicating the likelihood that users would recommend the system to others. Generally, a percentile rank above 80 percent is considered favorable, suggesting a positive user endorsement of the system.

**Figure 4. Sauro's Percentile Rank Chart**



The SUS evaluation score for the website-based multimodal media developed within the deep learning approach is 78.50. Referring to Figure 4, the graph indicates a grade of B with a percentile rank of approximately 82 percent. Sauro and (Lewis, 2018) also map these letter grades to specific score ranges, as shown in Table 5.

**Table 5. SUS Scores in the Grading Scale (Sauro and Lewis, 2012)**

SUS Score Grade	Grade	Percentile Range
84.1 - 100	A+	96 - 100
80.8 - 84	A	90 - 95
78.9 - 80.7	A-	85 - 89
77.2 - 78.8	B+	80 - 84
74.1 - 77.1	B	70 - 79
72.6 - 74	B-	65 - 69

71.1 - 72.5	C+	60 - 64
65 - 71	C	41 - 59
62.7 - 64.9	C-	35 - 40
51.7 - 62.6	D	15 - 34
0 - 51.7	F	0 - 14

Based on the System Usability Scale (SUS) score of 78.50, the web-based multimodality media within the deep learning approach is categorized as Grade B+ with a percentile range of 80-84 and a SUS score range of 77.2-78.8. This value indicates that the media has a good level of usability and is acceptable to users. These findings suggest that the developed media is feasible for further implementation in an actual learning context. As a follow-up to these results, during the implementation stage, this study developed EcoKids, a digital learning medium that represents the application of web-based multimodal learning within the context of environmental education in elementary schools. This section explains the design, content structure, and user experience in operating the EcoKids platform as a concrete realization of the developed media. Based on the System Usability Scale (SUS) measurement, the web-based multimodality media within the deep learning approach achieved a score of 78.50, which falls under Grade B+, with a percentile range of 80-84 and a SUS score range of 77.2-78.8. According to the interpretation by (Brooke 1996; Bangor et al., 2009), this score indicates that the media has good usability and falls within the acceptable range. These results suggest that the developed media is feasible for implementation in real learning contexts, as it meets the criteria of interface effectiveness, ease of navigation, and user satisfaction (Tullis & Stetson, 2004; Lewis & Sauro, 2017).

As a continuation of these findings, this research developed EcoKids, a web-based digital learning media grounded in multimodality, designed to support the deep learning approach in the context of environmental learning for elementary schools. The development of EcoKids is based on the principle that multimodal learning environments can enhance student engagement, conceptual understanding, and memory retention through the integration of text, visuals, audio, and digital interaction (Mayer, 2002). In addition, the application of user-centered design (UCD) principles ensures that the interface, content structure, and user experience align with the needs and characteristics of elementary school students (Vesin et al., 2018)

Thus, the SUS score of 78.50 not only confirms that the media is usable, but also strengthens the argument that the integration of multimodality and deep learning through a web-based

platform such as EcoKids has the potential to improve the quality of the teaching and learning process in the digital era. This finding is consistent with previous studies showing that digital media with high usability levels positively contribute to learning motivation, student autonomy, and learning effectiveness (Noor et al., 2022)

Although the overall SUS score of 78.50 indicates that the developed website-based multimodal media has good usability and is acceptable to users, a closer examination of the item-level responses provides useful insights for improvement. Items with relatively lower average ratings particularly those related to statements such as “I need to familiarize myself further before using this media” (P10) and “I need assistance from another person or technician to use this media” (P4) suggest that some teachers still experience initial difficulties in navigating certain features. This indicates the need for clearer onboarding instructions and user guidance within the system. Additionally, minor inconsistencies perceived in interface design, reflected in the response pattern for item P6, highlight opportunities to enhance layout uniformity and the visual hierarchy of the platform. Addressing these issues can reduce cognitive load and improve navigation fluency, especially for users with moderate digital literacy levels. From a practical perspective, these findings imply that while the media is already functional and engaging, further refinements in user interface design, instructional scaffolding, and technical support would optimize its usability. Therefore, subsequent development cycles should integrate user feedback through iterative usability testing to ensure that the system accommodates diverse teacher profiles and minimizes barriers to adoption. Strengthening these aspects will not only increase efficiency and user satisfaction but also enhance teachers’ confidence in integrating digital multimodal media into their instructional practices

The developed website is a digital-based learning medium designed to introduce and instill values of environmental awareness among elementary school students through an educational approach that is enjoyable, interactive, and contextual, as illustrated in Figure 5. The website is developed using a multimodal approach, combining various forms of information presentation such as illustrated stories, animated videos, educational games, interactive audio, and project-based learning activities

Research by (Ivanka & Nurani, 2025) shows that the application of interactive digital media in environmental literacy learning at the elementary level significantly improved students’ understanding scores, with an average pretest score of 44.28 rising to 80 in the posttest after digital learning intervention. Similar findings are supported by (Ramdani & Jufri, 2022), who developed *Interactive Multimedia Inquiry Based on Local Wisdom* to enhance environmental

awareness. Their study demonstrated that learning media based on local wisdom not only improved learning outcomes but also fostered higher ecological awareness compared to conventional learning methods. Furthermore, (Ninsiana et al., 2024) affirmed that implementing digital learning focused on environmental issues can strengthen ecological literacy from an early age, as digital media provide an immersive and contextual learning experience.



Figure 5. Home Section of The Website

As a concrete implementation of the developed website concept, the Home section of the website, named EcoKids, serves as the main landing page that presents various multimodal elements designed to attract attention and facilitate user exploration of learning content. On this page, users are greeted with interactive visual displays featuring environmental-themed illustrations, audio navigation that provides voice guidance, and dynamic animations that enhance an enjoyable learning experience. In addition, there is an interactive menu that connects users to various features such as illustrated stories, educational videos, learning games, reflective quizzes, and environmental project activities. As illustrated in *Figure 5*, this combination of text, images, sound, video, and user interaction represents the practical application of a multimodal approach, aiming to support diverse learning styles and increase student engagement in understanding environmental awareness values. In line with this, (Nur & Lubis, 2025) found that implementing methods integrating textual, visual, and auditory elements significantly enhances students' ecological literacy, both in terms of cognitive understanding and emotional engagement with environmental issues.

The Student Worksheet (LKPD) feature supports project-based learning, enabling students to apply their knowledge in real-world activities, such as maintaining school cleanliness. Such a multimodal approach has been proven effective in digital learning. (Ricoy, 2022) found that the use of technology-based educational games can enhance ecological awareness and digital

skills. Similarly, (Agung et al., 2023) stated that interactive multimedia with environmental themes helps improve science learning outcomes in elementary schools. Therefore, the design features of the EcoKids website reflect the application of digital multimodal learning principles that are engaging, contextual, and interactive supported by the latest educational research findings.

In the EcoKids platform, learners are invited to join child-friendly cartoon characters on environmental-themed learning adventures designed through a gamification approach. Environmental issues such as plastic waste, water pollution, deforestation, and global warming are presented as missions, challenges, and game levels that learners must progressively complete. Each challenge is framed within a problem-based narrative and encourages learners to solve environmental issues creatively and collaboratively, while earning points, badges, or virtual rewards as positive reinforcement. In addition, EcoKids includes features such as self-reflection prompts, weekly challenges, and a reporting system for real-world environmental actions, which are converted into scores or tracked via a progress tracker. This design fosters active engagement and a sense of responsibility toward the environment through immersive, enjoyable, and meaningful learning experiences.

## **CONCLUSION**

Based on the research findings using the System Usability Scale (SUS) instrument, it can be concluded that the website-based multimodal learning media developed through a deep learning approach received a high level of acceptance from elementary school teachers. The average SUS score of 78.50 indicates that the media is perceived as easy to use, beneficial, and effective in supporting the learning process in elementary education settings.

These findings confirm that the use of web-based technology integrating multimodal elements such as text, images, video, and interaction effectively enhances teachers' teaching experiences and student engagement. Thus, this media holds significant potential for broader implementation and further development in alignment with 21st-century learning needs.

Future development of similar media should consider incorporating personalization features and providing initial training for teachers to ensure optimal utilization across varying levels of technological proficiency. Additionally, further trials should be conducted on a larger scale and in diverse instructional contexts to comprehensively assess the media's impact on student learning outcomes.

The findings further underscore the importance of designing technology-based learning media that are not only interactive in content but also easily accessible and usable by educators. The success of this media can serve as a model for developing similar resources at the elementary education level, in alignment with the spirit of digital transformation and the Merdeka Curriculum, which promotes more contextual, flexible, and meaningful learning.

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