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Evaluation of The Usability of The SIMPAUD Website in Surabaya City Using the Website Usability Evaluation Method (WEBUSE)

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ABSTRACT

One of the needs of educational institutions today is to provide access to data or information in the form of a management information system. In order to support quality learning for students from PAUD to TK, an effective and efficient information system is needed. The PAUD Information Management System (SIMPAUD) is here as a solution to help early childhood educators upload student information. SIMPAUD is a website managed and developed by the education office which is useful for teachers, especially educators from PAUD to TK. This study uses the Website Usability Evaluation (WEBUSE) method. The type of research used in this thesis is a quantitative method. This study obtained 110 respondents who were distributed to TK, KB, and PPT in Surabaya. Based on the evaluation of the SIIMPAUD website in terms of usability using the WEBUSE method, the total number of points was 0.59. This value indicates that the SIMPAUD website is included in the moderate category, which means that the SIMPAUD website still has several problems so that further research is needed so that these problems get better usability results. The usability dimensions that play an important role based on the results of the questionnaire data processing are Navigation and Links, because these categories are important in finding information in using it. The proposed solution recommendations based on the 4 variable usability problems are 10 solution recommendations.

Keywords: Evaluation, Usability, Website Usability Evaluation (WEBUSE), SIMPAUD

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1. INTRODUCTION

The development of information systems is currently very rapid, with many people using information systems to facilitate various aspects of life, from personal needs to organizational activities. One type of information system that has been widely developed is the web-based information system. A website is a collection of pages within a domain that contains various information so that internet users can read and view it through a search engine.

An institution, especially an educational institution, certainly has various needs to support its educational management activities. One of the current needs of educational institutions is to provide access to data or information in the form of a management information system. A management information system is a tool used to support processes,

operations, evaluations, and technology and information [14]. The purpose of establishing a Management Information System (MIS) is to provide organizations with useful information for management decision-making [13].

To support quality learning for students from early childhood education to kindergarten, an effective and efficient information system is needed. The Early Childhood Education Information Management System (SIMPAUD) is a solution to help early childhood educators upload student information. SIMPAUD is a website managed and developed by the Department of Education, designed to benefit educators, particularly those working with children from preschool through kindergarten. SIMPAUD is mandatory for all educators in preschool through kindergarten to upload data related to student learning. SIMPAUD serves as an easy solution for advancing academic management in preschool through kindergarten, making the administration of preschool and kindergarten more streamlined.

Usability comes from the word usable, which generally means that something can be used well. Usability, or "usability," is related to the readability of information. Usability indicators are used to measure how satisfied users are in using technology, applications, or products to achieve their goals. Based on the interview results, users still complain about problems with the SIMPAUD website. Based on the interview results, users still complain about issues with the SIMPAUD website. To determine whether the website has good usability, a usability evaluation of the website must be conducted. Etymologically, "evaluation" originates from the English word "evaluation," derived from the root word "value," which means value or price [8].

There are several methods that can be used to measure how useful a website is, including Heuristic Evaluation, Website Usability Evaluation (WEBUSE), and System Usability Scale. Each method has its own advantages and disadvantages. For example, the Website Usability Evaluation (WEBUSE) method has the advantage of being a standard for measuring usability, using a web- based questionnaire evaluation method that allows users to assess the usability of the website being evaluated. However, the drawback of this method is that the evaluation results are highly dependent on the number and quality of respondents involved in completing the questionnaire [9]. The WEBUSE method was chosen because it can be used to help evaluate and identify issues related to both the good and bad aspects of a website's usability. The WEBUSE method considers various aspects relevant to the context of the website, such as content, navigation, and user interaction.

2. METHODS

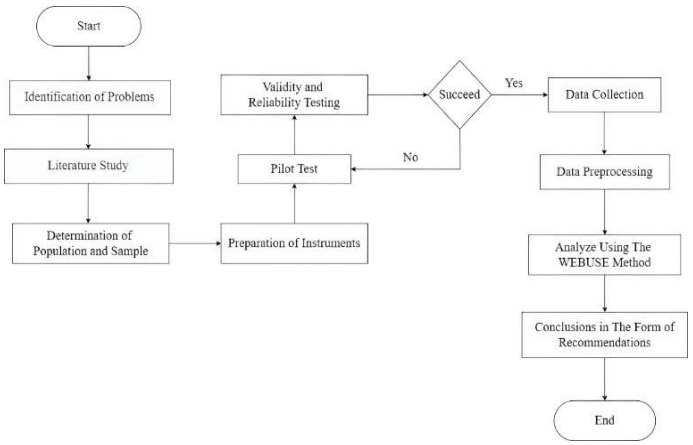

Figure 1 Flow of Research

The type of research used in this study is quantitative research. Quantitative research emphasizes analysis of numerical data processed using statistical methods [10]. Quantitative research generally uses statistical or numerical data as the basis for data analysis. This research was conducted using systematic steps to obtain optimal results and to ensure that the objectives of this research could be achieved properly.

2.1 Problem Identification

Problem identification is carried out to make it easier for researchers to determine the problems they will face. At this stage, the problems present on the SIMPAUD website will be identified. As outlined in the background, the problem identification in this study focuses on how the evaluation of the SIMPAUD website using the WEBUSE method is conducted. The problems identified on the SIMPAUD website will also be observed through the distribution of questionnaires to users of the SIMPAUD website.

2.2 Literature Study

Literature study is a series of activities related to methods of collecting library data, reading and taking notes, and managing research materials. Literature study is used to obtain additional data and information that supports this research. Literature study is carried out by searching for references from various sources such as journals on information system evaluation using the WEBUSE method, books on research methodology, and other sources.

2.3 Determination of Population and Sample

In this study, the researchers chose the simple random sampling technique, commonly abbreviated as random sampling, which is a method of sampling in which each member of the population is given an equal opportunity to be selected as a sample (Arieska & Herdiani, 2018). The population in this study was users who had accounts on the SIMPAUD website. Based on data from the Dapodik website, there are 7,162 early childhood educators in Surabaya. The technique used in this study is the Slovin method. The Slovin formula is used to calculate the minimum sample size that represents the entire population [12].

The following is the formula for using the Slovin method.

$$n = \frac{N}{1+Ne^2} \quad (1)$$

$$n = \frac{7162}{1+7162*0,1^2} = \frac{7162}{72,62} = 98,62$$

Notes:

n = sample

N = population (number of population) e = margin of error (10% = 0.1)

From the above calculation, it can be concluded that the minimum sample size required for this study is rounded to 100 respondents.

2.4 Intrument Development

Research instruments play an important role in obtaining data. The questionnaire will contain 24 questions found in the WEBUSE method. These 24 questions will be used to evaluate the usefulness of the website being studied.

2.5 Pilot Test

Before conducting research on all respondents, a pilot test was first conducted. The pilot test questionnaire in this study was distributed to 20 respondents.

2.6 Validty and Realiability Testing

Statistical data analysis in this study was conducted using validity and reliability tests to test the research instruments. The validity test was conducted to determine whether an instrument was valid or invalid in measuring a research variable, for example in a questionnaire. The validity test was conducted on a laptop using SPSS software version 18. The validity test of the instrument was conducted on 20 respondents. Validity was determined based on the calculated t-value (Person Product Moment) > r table and significance of 5%, so that the item or statement was considered valid. The reliability test in this study will show how consistent the respondents' answers are to the same or similar questions at different times or in different forms. If the instrument is not reliable, then the validity of the research results is also questionable. A questionnaire is considered reliable if the Cronbach's Alpha value is greater than 0.6 [5].

2.7 Data Collection

Data collection is an important step in research to obtain accurate and relevant information. In the context of evaluating the usability of the SIMPAUD website, the purpose of data collection is to understand the characteristics of the SIMPAUD website and evaluate the factors that influence the usability of the SIMPAUD website. The data sources to be used for data collection include conducting interviews with several SIMPAUD website users and distributing questionnaires to SIMPAUD website users.

2.8 Analyzing With The WEBUSE Method

The collected data will be converted into merit values accumulated for each variable, referred to as usability points (Dewi, 2018). When analyzing the SIMPAUD website, calculations will be performed on all questions distributed to 100 respondents, followed by analysis using the WEBUSE method. The steps in usability testing using the WEBUSE method are [6].

1. Select the site to be evaluated.
2. Respondents fill out all the questions on the questionnaire.
3. Merit is determined based on respondents' answers to each question, then summed for each usability category.
4. The score for each usability category is the average score of each category.
5. The overall usability score is the average of the usability scores for the four categories.

6. The usability level is determined by the overall usability score.

Managing the questionnaire data involves observing and summarizing the data using reliability and validity tests with the SPSS application. When distributing the questionnaire, users will fill in their names, provide proof of access to the SIMPAUD website, and answer several questions based on the four components. After the questionnaire data is collected, it will be managed by calculating the number of responses received and analyzing them using the WEBUSE method.

3. RESULTS AND DISCUSSION

This research is quantitative in nature, where the data produced will be in the form of numbers. The data obtained was analyzed using SPSS software. The purpose of this research is to evaluate the usability of the SIMPAUD website. Data was collected through interviews and questionnaires distributed to early childhood education teachers in Surabaya who have SIMPAUD website accounts. This questionnaire was distributed using a Google form that was created and then disseminated via WhatsApp to SIMPAUD website users, ranging from early childhood teachers to kindergarten teachers. This study used a 1-5 merit scale, which used 4 variables from the WEBUSE method consisting of content, organization and readability, navigation and links, user interface design, and performance and effectiveness.

3.1 Respondent Demographics

The questionnaire was distributed using a Google form that was created and then disseminated via WhatsApp to SIMPAUD website users, ranging from early childhood education teachers to kindergarten teachers. This study used a 1-5 merit scale, which used four variables from the WEBUSE method, consisting of content, organization, and readability, navigation and links, user interface design, and performance and effectiveness. This study was conducted to determine the level of usability on the SIMPAUD website using the website usability evaluation (WEBUSE) method.

3.2 Preprocessing Data

To determine the quality of the data obtained, researchers examined the completeness of respondent data by preprocessing the data to prepare it and detect or correct damaged or inaccurate records from a data set. Data preprocessing is important to ensure consistency in the data. After reviewing all results from the 110 respondents, the collected data was found to be complete with no missing values. Based on the data collected from the 110 respondents, all results are valid. The pilot test aimed to ensure that the questionnaire items were sufficient and correct according to the respondents [15].

3.3 Respondent Summary

In this study, the instrument used was a questionnaire. The questionnaire was distributed using Google Forms. The questionnaire was distributed through face-to-face meetings and WhatsApp to obtain respondents. The following are the results of the respondents who filled out the questionnaire.

Table 1 Summary of Respondent Results

Variable	Code	Scale				
		STS	TS	N	S	SS
Content, Organization and Readability	COR1	2	14	13	69	12
	COR2	1	21	14	64	10
	COR3	0	6	16	75	13
	COR4	1	39	19	42	9
	COR5	0	7	36	57	10
	COR6	3	65	21	19	2
Navigation and Links	NAL1	0	29	17	57	7
	NAL2	1	25	18	64	2
	NAL3	0	40	18	48	4
	NAL4	0	36	27	44	3
	NAL5	0	19	23	65	3
	NAL6	0	49	12	46	6
User Interface Design	UID1	0	10	21	74	5
	UID2	1	8	13	86	2
	UID3	0	25	22	53	10
	UID4	0	3	37	65	5
	UID5	0	38	16	51	5
	UID6	0	18	27	62	3
Performance and Effectiveness	PAE1	3	42	20	43	2
	PAE2	0	49	10	52	4
	PAE3	0	19	33	54	4
	PAE4	0	40	18	49	3
	PAE5	0	21	18	70	1
	PAE6	0	4	31	73	2

3.4 Validity and Reliability Testing

In the data splitting stage, the dataset is divided into two or more subsets. This process aims to enable more in-depth and focused sentiment analysis on certain aspects. By separating the data into different subsets, the analysis can be carried out more specifically and effectively, providing more accurate and relevant results according to the needs of the research or study being conducted. The data splitting stage is carried out by dividing the data using a 70:30 ratio, with the aim of obtaining more optimal results.

1. Validity

Validity testing is conducted to determine whether an instrument is valid or invalid in measuring a research variable, such as in a questionnaire. Validity testing was conducted on a laptop using SPSS software version 18. This validity testing was conducted to determine whether the questions in the instrument truly measure the concept to be measured. Research results based on a valid instrument are stronger and more convincing. This determination is based on the calculated t-value (Person Product

Moment) > r table and significance of 5%, so the item or statement is considered valid. The r table value with a sample size of 110 is 0.186. The following are the results of the instrument validity test:

Table 2 Validity Test Results

Variabel	Indicator	r Calculation	r table (5%)	Description
Content, Organization and Readability	COR1	0, 779	0,186	Valid
	COR2	0,824	0,186	Valid
	COR3	0,729	0,186	Valid
	COR4	0,765	0,186	Valid
	COR5	0,798	0,186	Valid
	COR6	0,596	0,186	Valid
Navigation and Links	NAL1	0,800	0,186	Valid
	NAL2	0,751	0,186	Valid
	NAL3	0, 811	0,186	Valid
	NAL4	0,813	0,186	Valid
	NAL5	0,746	0,186	Valid
	NAL6	0,698	0,186	Valid
User Interface Design	UID1	0,610	0,186	Valid
	UID2	0,608	0,186	Valid
	UID3	0,821	0,186	Valid
	UID4	0,642	0,186	Valid
	UID5	0,788	0,186	Valid
	UID6	0,777	0,186	Valid
Performance and Effectiveness	PAE1	0,833	0,186	Valid
	PAE2	0,779	0,186	Valid
	PAE3	0,796	0,186	Valid
	PAE4	0,824	0,186	Valid
	PAE5	0,663	0,186	Valid
	PAE6	0,680	0,186	Valid

Of the 110 respondents who completed the questionnaire, it has been proven to be valid. As shown in Table 2 above, this is because each item has a calculated r greater than the table r.

2. Reliability

After conducting a validity test, a reliability test will then be conducted to determine whether it is reliable so that the data obtained can also be taken into account. The reliability test will show how consistent the respondents' answers are to the same or similar questions at different times or in different forms. If the instrument is not reliable, then the validity of the research results will also be questionable. A questionnaire is considered reliable if the Cronbach's Alpha value is greater than 0.6 [5]. The following are the reliability test results:

Table 3 Reliability Test Results

Variable	*Cronbach's Alpha*	Description
Content, Organization, and Readability	0,838	Reliabel
Navigation and Link	0, 862	Reliabel
User Interface Design	0, 805	Reliabel
Performance and Effectiveness	0, 854	Reliabel

As can be seen in Table 3 above, the Cronbach's Alpha values for each variable obtained a strong level of reliability. Thus, it can be stated that the questionnaire is highly reliable.

3.5 Respondent Characteristics

The characteristics of the respondents in this study reflect the diversity of backgrounds that may influence the results of the SIMPAUD website usability evaluation. This study involved 110 kindergarten teachers who had active accounts on the SIMPAUD website. The following are the details of the respondents' characteristics:

1. Age

   From the results obtained, it is known that the survey results show that the age of SIMPAUD website users consists of various age groups ranging from 19 to 60 years old. There are 13 people (12%) aged 19-30 years old. There are 9 people (8%) aged 31-40 years old. There are 46 people (43%) aged 41-50 years old. There are 42 people (37%) aged 51-60 years old.

2. School Origin

   From the results obtained, it is known that the average origin of respondents consists of PPT, KB, and TK. Respondents with TK school origins dominate, namely 41 TK (70%). Then there are 18 PPT (26%) and finally 3 KB (4%) school origins.

3. Gender

   From the results obtained, it is known that the gender of SIMPAUD website users is female, totaling 110 people (100%). Thus, it can be concluded that the average SIMPAUD website user is female.

3.6 Analyzing Using WEBUSE

The questionnaire was distributed to 110 respondents who were users of the SIMPAUD website, namely early childhood education teachers in Surabaya. The results of the questionnaire will then be calculated to determine the average usability score for each question and variable. The usability calculation results for each category are as follow:

1. Variable Content, Organization, and Readability

After converting to a merit scale, each attribute will be divided by the number of respondents, which is 110. The merit values of each attribute will then be added up and divided by the total number of questions to produce a usability score. The following are the scores produced in the Content, Organization, and Readability categories:

Table 4 Point and Level Usability Content Categories, Organization, and Readability

Category	Point Usability	Level Usability
COR1	0,67	Good
COR2	0,63	Good
COR3	0,71	Good
COR4	0,54	Moderate
COR5	0,65	Good
COR6	0,32	Moderate

$$x = \frac{[\sum(Merit\ for\ each\ item\ on\ the\ variable)]}{[Total\ answers\ per\ variable]} \quad (2)$$

$$x = \frac{0,67+0,63+0,71+0,54+0,65+0,32}{6} = \frac{3,52}{6} = 0,59$$

Based on the usability point results for the variables of Content, Organization, and Readability, the score was 0.59, which falls within the “moderate” usability level.

2. Variable Navigation and Links

After converting to a merit scale, each attribute will be divided by the number of respondents, which is 110. The merit values of each attribute will then be added up and divided by the total number of questions to produce a usability score. The following are the scores produced in the Navigation and Links categories:

Table 5 Point and Level Usability Navigation and Links

Category	Point Usability	Level Usability
NAL1	0,60	Good
NAL2	0,59	Moderate
NAL3	0,54	Moderate
NAL4	0,53	Moderate
NAL5	0,61	Good
NAL6	0,53	Moderate

$$x = \frac{0,60+0,59+0,54+0,53+0,61+0,53}{6} = \frac{3,4}{6} = 0,57$$

Based on the usability point results for the variables of Navigation and Links, the score was 0.57, which falls within the “moderate” usability level.

3. Variable User Interface Design

After converting to a merit scale, each attribute will be divided by the number of respondents, which is 110. The merit values of each attribute will then be added up and

divided by the total number of questions to produce a usability score. The following are the scores produced in the User Interface Design categories:

Table 6 Point and Level Usability User Interface Design

Category	Point Usability	Level Usability
UID1	0,67	Good
UID2	0,68	Good
UID3	0,61	Good
UID4	0,66	Good
UID5	0,55	Good
UID6	0,61	Moderate

$$x = \frac{0,67+0,68+0,61+0,66+0,55+0,61}{6} = \frac{3,78}{6} = 0,63$$

Based on the usability point results for the variables of User Interface Design, the score was 0.63, which falls within the "good" usability level.

4. Variable Performance and Effectiveness

After converting to a merit scale, each attribute will be divided by the number of respondents, which is 110. The merit values of each attribute will then be added up and divided by the total number of questions to produce a usability score. The following are the scores produced in the Performance and Effectiveness categories:

Table 7 Point and Level Usability Performance and Effectiveness

Category	Point Usability	Level Usability
PAE1	0,50	Moderate
PAE2	0,55	Moderate
PAE3	0,60	Good
PAE4	0,53	Moderate
PAE5	0,62	Good
PAE6	0,67	Good

$$x = \frac{0,50+0,55+0,60+0,53+0,62+0,67}{6} = \frac{3,47}{6} = 0,58$$

Based on the usability point results for the variables of User Interface Design, the score was 0.58, which falls within the "moderate" usability level.

5. WEBUSE calculation for all categories

After determining the usability points and usability levels for each category, a usability analysis was conducted to determine the usability level of the SIMPAUD website.

Table 8 Point and Level Usability

Variable	Point Usability	Level Usability	Point Usability Website	Level Usability Website
Content, Organization, and Readibility	0,59	Moderate	0,59	Moderate
Navigation and Links	0,57	Moderate		
User Interface Design	0,63	Good		
Performance and Effectiveness	0,58	Moderate		

Based on the values in the table above, the usability points for the SIMPAUD website are calculated as follows:

$$x = \frac{[\sum(Usability\ Level)]}{[number\ of\ categories]} \quad (3)$$

$$x = \frac{0,59+0,57+0,63+0,59}{4} = \frac{2,37}{4} = 0,59$$

Based on the results of calculations for all categories in terms of usability using the WEBUSE method, an overall score of 0.59 was obtained, indicating that the SIMPAUD website falls into the moderate (poor) category.

CONCLUSIONS

Based on the evaluation conducted using the WEBUSE method in this study, it can be concluded that: Based on the evaluation of the SIIMPAUD website in terms of usability using the WEBUSE method, the total score was 0.59. This score indicates that the SIMPAUD website falls into the moderate category, which means that the SIMPAUD website still has several issues that require further research in order to achieve better usability results. Of the four variables, the one with the highest usability score was User Interface Design, which scored 0.63. Next is the Content, Organization, and Readability variable with 0.59, the Performance and Effectiveness variable with 0.58, and finally the Navigation and Links variable with 0.57. The usability dimension that plays an important role based on the questionnaire data analysis results is Navigation and Links, because this category is important in finding information when using the website. Based on the usability issues of the four variables, there are 10 recommended solutions. These recommended solutions are proposed for use in improving the SIMPAUD website in the future and can be used as input for website developers to develop the website for the better.

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