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User Interface and User Experience Design for Vidyanusa on Android Mobile Phones Using an Evaluation Framework

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ABSTRACT

This research will evaluate the User Interface and User Experience (UI/UX) of Vidyanusa for Android mobile phones. User Experience will be measured using sub-variables such as attractiveness, agility, efficiency, dependability, stimulation, and novelty. The object of this research is User Experience. The results of this research will be used to evaluate Vidyanusa's Android mobile product to achieve a product that is suitable for users at the junior high school level. User experience testing on the Vidyanusa mobile application uses evaluation methods with query techniques. Evaluation is a test of the level of system usability and functionality that is carried out in the laboratory, in the field, or in collaboration with users. What is evaluated is the design and implementation, and the technique used is the evaluation technique with the User Experience Questionnaire. The results of the user experience testing of the Vidyanusa mobile application tend to be negative on the points of attractiveness, perspicuity, efficiency, dependability, and novelty based on the User Experience Questionnaire in the benchmark table, but positive on the point of stimulation.

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1. INTRODUCTION

In this era of globalization, there has been a surge in technological advancements that are being utilized in various fields, including education. Technology plays a crucial role in education, and its impact cannot be overstated. Technological advancements have revolutionized the way we conduct processes and create products, transforming simple tasks into effortless endeavors. Similarly, education has undergone a remarkable transformation, enabling individuals to gain knowledge and understanding that were previously unattainable. Moreover, technology empowers students to comprehend and utilize it effectively to enhance their educational experiences.

As information technology continues to evolve, individuals, institutions, and governments are actively exploring ways to leverage its potential. In the realm of education in Indonesia, the time has come to embrace the benefits of information technology. With the introduction of e-learning programs, computer-based national examinations, and other technological advancements, all components of educational institutions are required to prepare

themselves by equipping their facilities with the necessary infrastructure to effectively utilize these advancements. Information technology has the potential to significantly enhance the learning process, addressing the ever-increasing demand for knowledge and technological expertise that cannot be solely obtained within traditional school settings. Additionally, the exchange of data and information among schools, schools and communities, schools and local and central governments, and other stakeholders can be rendered more effective and efficient through the implementation of information technology.

The term "e-learning" encompasses a wide range of technologies employed to support teaching endeavors through the internet and other electronic means. Therefore, e-learning is more accurately defined as an endeavor to transform traditional teaching and learning processes in schools and universities into a digital format facilitated by internet technology [1]

2. LITERATURE REVIEW

2.1 User Experience

User experience (UX) has become a crucial aspect in product and service design. According to[2], an information system should not only be usable and useful but should also make users feel comfortable using it. Many experts argue that the offered user experience is an indicator of a website's success. By conducting evaluations through the UX approach, it is possible to understand what users feel, whether they feel happy, find it easy, feel pressured, or feel satisfied when using an application system.

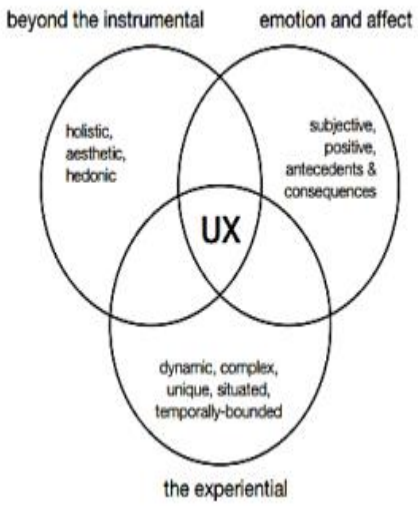

Figure 1: Three aspects of UX

2.2 Experience

The experiences gained by consumers through participation and engagement on the internet have the potential to be captured more strongly than the experiences gained by consumers from other conventional media. Therefore, it can be said that the quality of the user experience on a website can influence the overall feelings, beliefs, and even user judgments that are associated with the brand can be more strongly embedded than experiences through other media[3].

2.3 User Interface

The user interface (UI) is the mechanism used by users and expert systems to communicate. The interface receives information from the user and transforms it into a form that can be accepted by the system. In addition, the interface receives information from the system and presents it in a form that can be understood by the user. According to McLeod (1995), in this section, a dialogue takes place between the program and the user, which allows the expert system to receive instructions and information (input) from the user, as well as provide information (output) to the user[4].

2.4 Website

A website is a collection of interconnected web pages that can be accessed through the internet. It encompasses a wide range of information, multimedia content, and data accessible to users via their web browsers. Websites serve as valuable

reference or citation sources in papers, either to support arguments, provide data, or reference specific information sources. Websites can serve diverse purposes, such as delivering information, news, guides, reports, articles, products, services, social interactions, or business transactions. Additionally, websites can be utilized by various entities, including companies, non-profit organizations, governments, educational institutions, individuals, and many more[5].

3. METHODS

3.1. Tools and Materials

a. Stationery for making UI Storyboards
b. UX Questionnaire using UEQ
c. Usability questionnaire using SUS
d. Figma and Axure applications to design wireframes, mockups, and UI Prototypes.

3.2. Research Flow

The flow of research was carried out in designing the UI design of the Vidyanusa application

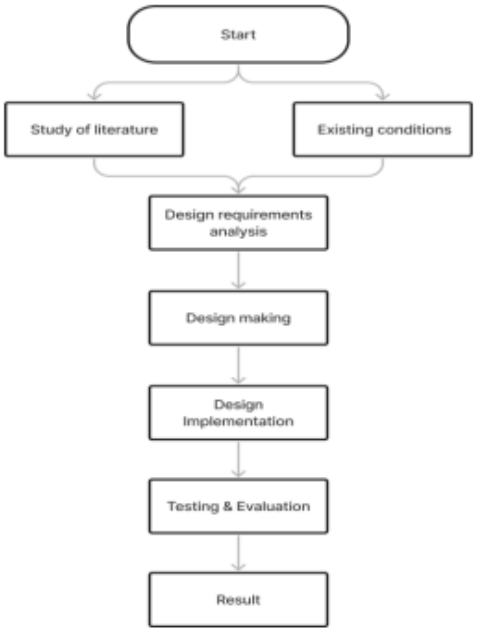

FIGURE 3.1 Research Flow

3.3. Data Collection

In collecting this data, we tested the Vidyanusa application prototype using the System Usability Scale (SUS) and the User Experience Questionnaire, which would be given to respondents later. The determination of the number of respondents to the problems tested is close to the level of certainty, namely 95%. Respondents involved included adolescents and adults with an age range of 15-50 years. This data collection was done using a random sampling technique.

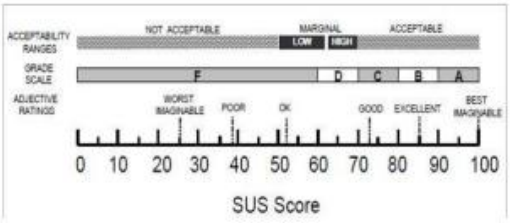

Figure 3.2 Sus Score

4. RESULTS AND DISCUSSION

User Experience Questionnaire (UEQ) is employed for the evaluation of Vidyanusa mobile application. The primary purpose of the User Experience Questionnaire (UEQ) is to facilitate rapid, direct measurement of user experiences with interactive products [6]. UEQ has been applied in diverse research contexts, such as the evaluation of business software development tools, websites and web services, and social networks [7].

UEQ utilizes a data analysis approach that evaluates the interaction of a product with its users. The objective of this approach is to ensure the practical relevance of diverse qualitative analyses of interactive products (scales). Each UEQ question falls under a specific evaluation metric referred to as a scale. There are six scales with 26 items for evaluating product experiences

1. Attractiveness: This scale measures the degree to which users find the product visually appealing and aesthetically pleasing.
2. Perspicuity: This scale measures the degree to which users find the product easy to understand and navigate.
3. Efficiency: This scale measures the degree to which users can effectively and efficiently achieve their goals using the product.
4. Dependability: This scale measures the degree to which users can trust

the product to perform reliably and consistently

5. Stimulation: This scale measures the degree to which users find the product engaging and motivating.
6. Novelty: This scale measures the degree to which users find the product innovative and original.

The mapping framework for the 26 product evaluation measurement items is shown in the following figure:

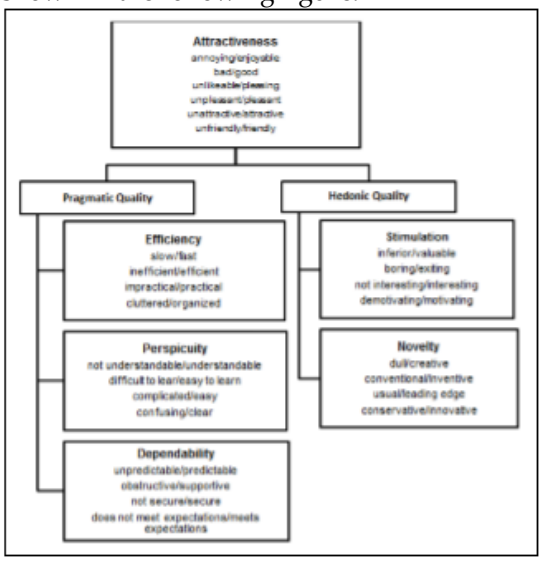

Figure 4.1 Product Mapping Framework

The UEQ survey is utilized to measure the user experience of interactive products, such as statistical software packages, mobile phone address books, online collaboration software, or business software. User experience is not only evaluated as an independent application but can also be compared with the evaluation of other products. Product comparisons can be viewed through the UEQ survey benchmark[8]

4.1 Experimental Procedures

Participants are given about a few minutes to familiarize themselves with the application and participants are given a task to solve a problem, for example to solve a surrounding question and answer the question by posting using the Vidyanusa mobile application. After completing the assigned tasks such as posting a blog or answering questions. Then a questionnaire will be given

4.2 Initial Findings

A total of 38 subjects participated in the study, all of whom were students at a junior high school. A comprehensive analysis of all data collected during the experiment will provide more detailed insights that will enable further refinement and user testing of the proposed interface.

	1	2	3	4	5	6	7		
menyusahkan	o	o	o	o	o	o	o	menyenangkan	1
tak dapat dipahami	o	o	o	o	o	o	o	dapat dipahami	2
kreati	o	o	o	o	o	o	o	monoton	3
mudah dipelajari	o	o	o	o	o	o	o	sulit dipelajari	4
bermanfaat	o	o	o	o	o	o	o	kurang bermanfaat	5
membosankan	o	o	o	o	o	o	o	mengasyikkan	6
tidak menarik	o	o	o	o	o	o	o	menarik	7
tak dapat diprediksi	o	o	o	o	o	o	o	dapat diprediksi	8
cepat	o	o	o	o	o	o	o	lambat	9
berdaya cipta	o	o	o	o	o	o	o	konvensional	10
menghalangi	o	o	o	o	o	o	o	mendukung	11
baik	o	o	o	o	o	o	o	buruk	12
rumit	o	o	o	o	o	o	o	sederhana	13
tidak disukai	o	o	o	o	o	o	o	menggembirakan	14
lazim	o	o	o	o	o	o	o	terdepan	15
tidak nyaman	o	o	o	o	o	o	o	nyaman	16
tidak aman	o	o	o	o	o	o	o	aman	17
tidak memotivasi	o	o	o	o	o	o	o	memotivasi	18
Tidak memenuhi ekspektasi	o	o	o	o	o	o	o	memenuhi ekspektasi	19
tidak efisien	o	o	o	o	o	o	o	efisien	20
membingungkan	o	o	o	o	o	o	o	jelas	21
tidak praktis	o	o	o	o	o	o	o	praktis	22
berantakan	o	o	o	o	o	o	o	terorganisasi	23
tidak atraktif	o	o	o	o	o	o	o	atraktif	24
tidak ramah pengguna	o	o	o	o	o	o	o	ramah pengguna	25
konservatif	o	o	o	o	o	o	o	inovatif	26

Figure 4.2 Questionnare

Items																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
7	7	1	1	1	7	7	6	2	3	6	1	5	6	6	7	2	1	2	5	4	5	3	2	1	7
5	4	6	5	5	4	3	4	5	6	3	7	4	2	5	4	7	5	6	4	7	3	4	5	4	3
4	5	3	3	4	5	4	3	4	2	6	3	3	5	6	6	2	2	3	4	5	3	2	2	2	6
7	7	1	1	1	7	7	7	1	1	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
4	5	3	4	2	6	5	4	3	2	6	3	4	4	5	5	3	3	3	5	3	5	3	4	2	5
4	6	3	6	4	3	4	5	4	5	6	3	6	4	4	5	3	3	4	6	6	5	3	4	5	6
6	7	6	1	1	7	7	7	2	7	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
6	7	6	1	1	7	7	7	2	7	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
3	6	6	5	5	5	5	4	5	5	4	7	1	1	4	1	7	7	7	1	7	1	6	6	6	6
3	5	4	3	3	3	4	5	3	4	3	3	3	4	3	4	5	3	5	4	6	5	4	3	5	6
7	7	1	1	1	7	6	4	3	4	7	1	7	6	4	7	3	3	2	6	2	5	2	2	1	4
7	5	7	3	1	7	7	1	2	1	7	1	5	6	4	6	2	1	3	4	3	5	2	4	1	7
7	4	1	6	1	7	7	7	2	4	7	1	3	7	7	7	1	1	4	7	2	7	1	1	1	7
7	3	1	6	1	7	7	7	2	4	7	1	3	7	7	7	1	1	4	7	2	7	1	1	1	7
4	7	7	5	6	5	6	6	6	6	7	7	7	7	6	7	6	6	4	5	3	7	6	4	6	6
3	5	3	4	2	4	4	5	2	5	3	2	3	4	3	4	2	5	3	5	5	2	4	4	6	1
3	3	6	6	1	4	3	4	4	4	5	1	3	4	5	5	1	3	2	5	3	4	3	4	1	6
7	7	6	1	1	7	7	6	1	7	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
2	2	4	4	5	3	3	3	4	3	3	5	2	3	3	2	4	4	3	3	4	3	1	1	4	1
2	2	4	1	5	3	2	3	2	3	4	4	1	2	3	2	4	1	3	1	2	4	1	3	2	3
6	5	4	3	2	4	4	4	2	3	4	2	5	4	4	6	2	3	4	4	4	5	3	4	1	4
2	2	3	3	4	2	4	3	5	4	2	4	5	3	2	3	5	4	3	2	5	3	5	3	5	2
7	4	4	5	1	7	5	5	5	1	7	1	7	7	5	5	1	1	2	5	6	4	3	4	2	6
4	5	4	3	1	6	7	6	2	4	6	1	4	7	6	7	3	1	4	4	1	4	4	4	1	4
5	6	7	3	3	5	6	5	2	1	6	3	5	5	6	5	2	1	2	6	3	6	1	2	1	6
2	3	4	6	5	4	5	2	3	4	5	1	2	4	3	3	2	2	5	3	7	1	5	4	1	4
3	4	5	2	3	4	5	1	4	1	5	1		2	7	5	2	1	4	5	7	7	1	3	2	7
3	5	6	5	1	6	5	3	4	4	5	1	4	5	5	5	1	1	1	4	6	5	1	1	1	1
6	7	2	3	1	6	6	5	2	3	6	1	7	7	5	7	3	2	6	7	6	7	1	2	1	7
4	4	4	3	2	4	4	4	3	6	5	2	6	4	4	5	3	3	4	6	2	5	2	4	3	6
6	7	1	1	1	7	7	7	2	6	7	1	7	5	7	5	1	1	2	7	2	7	1	1	1	7
6	7	1	1	1	7	7	5	1	1	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
4	1	7	7	1	7	7	7	1	1	7	1	1	4	7	7	1	1	1	7	7	7	7	1	1	7
1	2	6	4	1	3	3	4	7	5	5	2	1	2	3	2	1	2	1	6	6	7	3	4	1	7
7	7	1	2	1	7	6	7	2	4	6	1	7	6	4	5	1	3	3	5	5	2	3	4	2	7
2	3	2	2	3	3	2	2	2	2	3	4	2	2	3	2	2	4	2	2	2	2	5	1	2	1
3	3	5	7	1	2	3	4	4	4	5	1	2	4	5	3	4	3	2	5	7	4	3	5	4	6
1	1	7	6	6	1	1	2	7	6	1	6	1	1	1	1	6	7	7	2	7	1	7	7	7	1

Figure 4.3 Responses Participant

The figure illustrates the overall responses from a total of 38 participants, with each participant providing 26 responses. The response values still reflect the rating scale of 1 to 7.

Items																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
3	3	3	3	3	3	3	2	2	1	2	3	1	2	2	3	2	3	2	1	0	1	1	2	3	3
1	0	-2	-1	-1	0	-1	0	-1	-2	-1	-3	0	-2	1	0	-3	-1	-2	0	-3	-1	0	-1	0	-1
0	1	1	1	0	1	0	-1	0	2	2	1	-1	1	2	2	2	2	1	0	-1	-1	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0	1	1	0	2	2	1	0	1	2	2	1	0	0	1	1	1	1	1	1	1	1	0	2	1	1
0	2	1	-2	0	-1	0	1	0	-1	2	1	2	0	0	1	1	1	0	2	-2	1	1	0	-1	2
2	3	-2	3	3	3	3	3	2	-3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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-1	-1	-1	-3	3	-2	-1	0	0	0	1	3	-2	0	1	-1	0	1	2	1	-3	0	1	-1	0	2
-3	-3	-3	-2	-2	-3	-3	-2	-3	-2	-3	-2	-3	-3	-3	-3	-2	-3	-3	-2	-3	-3	-3	-3	-3	-3

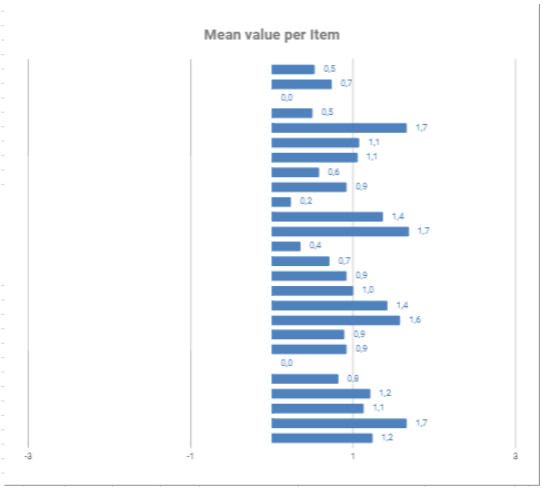
Figure 4.4 Rating Scale Value

For each response reflecting a rating scale value, the response value was then converted into a corresponding weight. The following is the sequential pairing of scales and their corresponding weights: (1,-3), (2, -2), (3, -1), (4,0), (5, 1), (6, 2), (7,3). So the answer weights are produced as shown in the figure above

Item	Mean	Variance	Std. Dev.	No.	Left	Right	Skale
1	0,5	3,8	2,0	38	annoying	enjoyable	Attractiveness
2	0,7	3,7	1,9	38	not understandable	understandable	Perspicuity
3	0,0	4,4	2,1	38	creative	dull	Novelty
4	0,5	3,8	1,9	38	easy to learn	difficult to learn	Perspicuity
5	1,7	2,9	1,7	38	valuable	inferior	Stimulation
6	1,1	3,4	1,8	38	boring	exciting	Stimulation
7	1,1	3,1	1,8	38	not interesting	interesting	Stimulation
8	0,6	3,2	1,8	38	unpredictable	predictable	Dependability
9	0,9	2,6	1,6	38	fast	slow	Efficiency
10	0,2	3,5	1,9	38	inventive	conventional	Novelty
11	1,4	2,8	1,7	38	obstructive	supportive	Dependability
12	1,7	3,6	1,9	38	good	bad	Attractiveness
13	0,4	4,8	2,2	37	complicated	easy	Perspicuity
14	0,7	3,8	1,9	38	unlikable	pleasing	Attractiveness
15	0,9	2,8	1,7	38	usual	leading edge	Novelty
16	1,0	3,7	1,9	38	unpleasant	pleasant	Attractiveness
17	1,4	3,2	1,8	38	secure	not secure	Dependability
18	1,6	3,0	1,7	38	motivating	demotivating	Stimulation
19	0,9	2,9	1,7	38	meets expectations	does not meet expectations	Dependability
20	0,9	3,2	1,8	38	inefficient	efficient	Efficiency
21	0,0	4,8	2,2	38	clear	confusing	Perspicuity
22	0,8	4,0	2,0	38	impractical	practical	Efficiency
23	1,2	3,4	1,8	38	organized	cluttered	Efficiency
24	1,1	2,7	1,6	38	attractive	unattractive	Attractiveness
25	1,7	3,5	1,9	38	friendly	unfriendly	Attractiveness
26	1,2	4,6	2,1	38	conservative	innovative	Novelty

Figure 4.5 Corresponding Weight

For each question, the mean, variance, and standard deviation were calculated based on the 38 responses provided by the participants. Each question was color-coded according to its group: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. The results can be seen in the figure above.



The image above shows the average value of each question, in negative, zero or positive positions.

UEQ Scales	
Attractiveness	1,118
Perspicuity	0,393
Efficiency	0,967
Dependability	1,066
Stimulation	1,342
Novelty	0,599

Figure 4.6 UEQ Scales

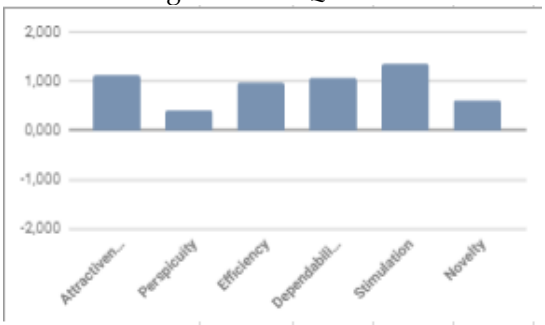
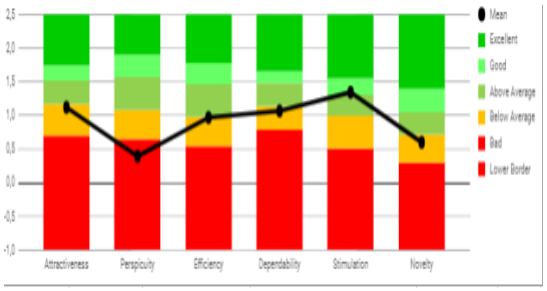


Figure 4.7 Chart Scale

The figure above illustrates the line graph of the average score for each question, categorized by its group. An average impression score between -0.8 and 0.8 is considered a normal evaluation, a score > 0.8 indicates a positive evaluation, and scores <- 0.8 represent a negative evaluation. Based on the figure above, the Vidyanusa mobile application exhibits a gradually decreasing impression score in the following order: stimulation, attractiveness, dependability, efficiency, novelty, and perspicuity.



The figure above indicates that the Vidyanusa mobile application obtained the following results:

- Attractiveness: Below Average
- Perspicuity: Poor
- Efficiency: Below Average
- Stimulation: Good
- Novelty: Below Average

5. CONCLUSION

Based on the implementation and testing results of the Vidyanusa mobile application, it can be concluded that the mobile application tends to have negative scores in the areas of attractiveness, perspicuity, efficiency, dependability, and novelty. However, it received positive results in the area of stimulation in the UEQ testing.

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