An User Experience Analysis of UNG E-Learning Using User Experience Questionnaire Tool

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ABSTRACT

The user experience measurement can reveal the strengths and weaknesses of an application. One of the tools used to measure the user experience of an application is the User Experience Questionnaire (UEQ). UEQ can provide feedback to developers on the Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty aspects of the application, whether it needs improvement or not. This study aims to measure the user experience of UNG E-learning using the User Experience Questionnaire (UEQ) on these six aspects. This research is quantitative research with a survey method approach. The tool used in analyzing the user experience of e-learning is UEQ. This study showed that the UNG e-learning was seen from the average respondents' answers were between -0.8 and 0.8, which means that the respondents gave neutral answers. Compared to other products in the benchmark, this e-learning gives poor results in Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty. Therefore, this e-learning requires quality improvement in user experience in these six aspects.

Keywords: User Experience Analysis, UEQ, E-Learning

1. INTRODUCTION

The rapid development of technology has a significant impact on many sectors, including the education sector at the university level. One form of information technology development that can be used as a learning medium is e-learning. The learning process previously done manually through face-to-face can now be done anywhere, anytime, and by anyone by utilizing electronic media connected to the internet network. Currently, most universities have used e-learning in the learning process, one of which is the Universitas Negeri Gorontalo (UNG), whose website can be accessed at the address kuliahdaring.ung.ac.id.

The utilization of e-learning at the Universitas Negeri Gorontalo (UNG) is used to carry out the learning process anywhere and anytime, following student learning style and speed. The conventional learning process requires the presence of students in class and listening to the lecturer explain the material presented. Learning with an online system such as online lectures is undoubtedly very helpful for students and lecturers in the current pandemic, requiring all learning processes to be carried out online. This, of course, must be supported by a good system and make students and lecturers comfortable in using it so that students and lecturers can maximize the learning process. The convenience of e-learning is inseparable from the quality of the designed e-learning services.

Service quality is a standard that must be carried out on an application to improve user experience in utilizing an application.

A system certainly has advantages and disadvantages. Each of these factors can impact the effectiveness and efficiency of the system on the user. Usually, the supporting aspects in increasing user interest in using a system can be seen from measuring the user experience on the system and are usually always seen from the perspective of the user as the user of the system and can be said to be a way to get a personal perspective about something [1].

User Experience can be used as a reference for interface design in an information system. User discomfort in utilizing a system or application can identify the failure of the system or application. User experience in Indonesian, namely user experience, is a science that examines what users feel in using the system to get satisfaction after using it. User Experience is a science that examines what users feel about using a system to get satisfaction after using it. User experience is essential to note, including in the design and development of a product or service. User experience is the effect felt by the user because of interaction with the system or product, which includes the effects of usability, usefulness, and emotional impact during the interaction [2]. From the opinions expressed, it can be interpreted that the user experience or opinion is the

overall effect that the user feels when interacting with the system or product.

One of the methods or tools commonly used to measure user experience is the user experience questionnaire (UEQ). This method uses a questionnaire to get feedback from system users. The user experience questionnaire, according to Schrep [3], is a method or tool used to measure the user experience of an application. Measurements using UEQ resulted in 6 aspects being analyzed, namely from the aspects of Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty. Attractiveness concerns whether the system/product is liked/disliked by its users. Efficiency, which discusses whether the system/product is easy to use and learn. Perspicuity discusses whether users solve problems on the system without more effort.

Dependability discusses whether the user feels the interaction on a controlled system. Stimulation discusses whether the system/product motivates users to use it. Novelty discusses whether the product is innovative and creative and can make users feel interested in using it. To measure using this method, the type of questionnaire used is in the form of point levels that each target sample will select. After that, the points are processed, and conclusions will be found from the measurement results, whether the system has a good enough value in every aspect or vice versa [4]. Each UEQ item has a term with the opposite meaning attached (example: troublesome fun). Each item on the UEQ has a scale range of 1 (one) to 7 (seven). The circles between the two opposite words represent opposite gradations, as shown in Figure 1.
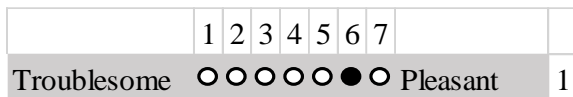
	1 2 3 4 5 6 7		
Troublesome	○○○○○●○	Pleasant	1

Figure 1. Example of UEQ Form

Figure 1 shows that respondents rated the product as more enjoyable than troublesome. UEQ has been translated into several languages, one of which is Indonesian.

Each statement item on the UEQ has a randomized sequence of positive and negative terms. In each aspect, half of it starts with a positive statement and half with a negative term. Each item on the UEQ has a scale of 1 (one) to 7 (seven), which is then transformed into a value range of -3 to +3.

According to Schrepp [5], UEQ cannot directly answer what needs to be changed in the product/application. UEQ only provides developers and product/application owners with an overview of what aspects of the product/application need improvement. So, to measure the user experience of what products/applications must be changed, it is necessary to measure the features of products/applications that are

connected. The Indonesian version of the UEQ is shown in Figure 2.

	1 2 3 4 5 6 7		
Troublesome	○○○○○○○	Pleasant	1
Can't understand	○○○○○○○	Understandable	2
Creative	○○○○○○○	Monotone	3
Easy to learn	○○○○○○○	Hard to learn	4
Beneficial	○○○○○○○	Less useful	5
Boring	○○○○○○○	Exciting	6
Not attractive	○○○○○○○	Interesting	7
Unpredictable	○○○○○○○	Predictable	8
Fast	○○○○○○○	Slow	9
Inventive	○○○○○○○	Conventional	10
Obstruct	○○○○○○○	Support	11
Good	○○○○○○○	Bad	12
Complicated	○○○○○○○	Simple	13
Dislike	○○○○○○○	Exhilarating	14
Common	○○○○○○○	Front	15
Uncomfortable	○○○○○○○	Comfortable	16
Safe	○○○○○○○	Not safe	17
Motivate	○○○○○○○	Not motivating	18
Meet expectations	○○○○○○○	Did'n meet expectations	19
Not efficient	○○○○○○○	Efficient	20
Clear	○○○○○○○	Confusing	21
Impractical	○○○○○○○	Practical	22
Organized	○○○○○○○	Untidy	23
Attractive	○○○○○○○	Not attractive	24
User friendly	○○○○○○○	Not user friendly	25
Conservative	○○○○○○○	Innovative	26

Figure 2. The Indonesian version of UEQ

1.1. Related Work

Anugrah et al. [6] conducted a study comparing the Usability Learning Management System of Edmodo and Google Classroom using the Cognitive Walkthrough and User Experience Questionnaire (UEQ) Method (Case Study: Vocational High School 3 at Malang). The results obtained include: The results of the Cognitive Walkthrough test show that the Google Classroom LMS has a total of eight problems, then the Edmodo LMS has nine problems. In distributing the UEQ questionnaire, Edmodo excels in aspects, namely clarity, accuracy, stimulation, and novelty. In contrast, Google Classroom excels in terms of attractiveness and efficiency. From these results, Google Classroom is more recommended for new users because it excels in the learnability aspect, but in terms of user experience, Edmodo is more recommended for use by students of vocational high school 3 Malang in teaching and learning activities in the classroom.

Izabal et al. [7] conducted a study that aims to find out the problems experienced by users by collecting

various perceptions of FILKOM Apps using the User Experience Questionnaire (UEQ) to measure the level of user experience of the old design and Focus Group Discussion (FGD) for more detailed user perceptions and problems. The research results obtained include: The first evaluation showed that the old design's user experience level reached a neutral value, and the UEQ benchmark category was "poor". In addition, more problems and negative perceptions were found in the FGD results so that the improved design that focused on the evaluation results of the old design was re-measured and got a large enough increase in the average value on each UEQ scale and an increase in the level of user experience on the UEQ benchmark. In addition, the collection of written perceptions produces more positive user perceptions.

1.2. Our Contribution

This paper provides an overview of the quality of UNG's e-learning in terms of Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty aspects.

1.3. Paper Structure

The rest of the paper is organized as follows. Section 2 introduces the research methods used in this paper. Section 3 presents the result and discussion of this research. Section 4 concludes the paper and presents a direction for future research.

2. METHODS

This research is a quantitative research method using a survey approach. Researchers conducted observations and distributed questionnaires to obtain primary data and information from respondents as research samples. According to Sugiyono [8], quantitative research is research based on the philosophy of positivism, used in researching specific populations or samples. Data analysis is quantitative or parametric statistics to describe and test predetermined hypotheses. In general, the stages of this research can be explained as follows:

1. Identify e-learning acceptance problems;
   At this stage, the identification of problems related to user experience while using e-learning kuliahdaring.ung.ac.id will be carried out. Identification is made by interviewing e-learning users, namely lecturers and students. The success indicator of this stage is identifying problems in the use of e-learning by students and lecturers.

2. Measuring the user experience
   Based on the results of interviews that have been carried out, then proceed with measuring user experience in terms of Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty aspects using UEQ. The output of this stage is the

result of measuring user experience in terms of Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty aspects. The indicator of the success of this stage is obtaining the result of measuring user experience from e-learning kuliahdaring.ung.ac.id.

3. RESULTS AND DISCUSSION

3.1. Result

This section will describe the process of analyzing the user experience of e-learning Kampusdaring.ung.ac.id using UEQ tools, viewed from the aspects of Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty. This study involved 83 respondents from the Information Systems program to obtain user satisfaction results from the e-learning website kuliahdaring.ung.ac.id.

3.1.1 Results of Identification of The User Traffic of kuliahdaring.ung.ac.id website Pages

One way to see the development of a website is to see how many people visit the website. The website kuliahdaring.ung.ac.id is a web-based application used as e-learning to help UNG students in the independent learning process anywhere and anytime. However, when viewed from the global ranking version of the Alexa site, the website Kampusdaring.ung.ac.id is only ranked 69,141 the most popular website globally, down 2% in the last three months, and only ranks 1,462 in Indonesia.
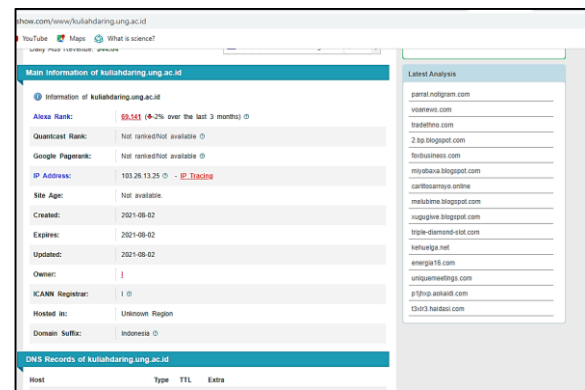
Figure 3. Website statistic of kuliahdaring.ung.ac.id

When viewed from the Quantcast, which measures the website's popularity, and the Google PageRank, which measures the website's appearance in the Google search engine, the website Kuliahdaring.ung.ac.id has no information or is not ranked. This certainly shows the lack of use of this e-learning website compared to the number of lecturers and students who will use this e-learning website. Therefore, it is necessary to measure the satisfaction of the users of this e-learning website to know the acceptance of this website among the academia of the State University of Gorontalo through

the UEQ measurement from this website page. Figure 3 is a statistic for the website kuliahdaring.ung.ac.id.

3.2. UEQ Questionnaire Analysis Results

The distribution of the UEQ questionnaire on the user experience of the kuliahdaring.ung.ac.id page was carried out online, and as many as 83 respondents gave answers. The results of each UEQ questionnaire question with a scale range of 1 to 7 are obtained, then transformed into positive and negative values with a value range of -3 to +3, as shown in appendix 2. The questions in the UEQ questionnaire are divided into six aspects of assessment: attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty.

The confidence interval is used to measure the accuracy of the average estimate of the scale, where the smaller the confidence interval, the higher the measurement precision and the more reliable the results. The confidence interval in this measurement is 5% for the average of the scale, and the average of each item displayed. The distribution of answers to each question item, illustrating if there is a polarization in the answers given (many negative answers and many positive answers and not too many neutral answers), can help provide a deeper view regarding the six aspects of the kuliahdaring.ung.ac.id page, whether more user experiences tend to be positive or negative. A reliability test is a test used to measure the consistency of the questionnaire, which is an indicator of the variables. This is done by looking at the results of the Cronbach alpha value based on research aspects, and if the Cronbach alpha value is more than 0.6, it is said to be reliable. The reliability test results of each aspect of the study using UEQ data analysis tools can be seen in Table 1.

Table 1. UEQ questionnaire reliability test

Variable	Cronbach Alpha	Description
Attractiveness	0.83	Reliable
Efficiency	0.69	Reliable
Perspicuity	0.60	Not reliable
Dependability	0.53	Not reliable
Stimulation	0.75	Reliable
Novelty	0.29	Not reliable

Table 2. Reliability test after deleting inconsistent data

Variable	Cronbach Alpha	Description
Attractiveness	0.87	Reliable
Efficiency	0.75	Reliable
Perspicuity	0.71	Reliable
Dependability	0.64	Reliable
Stimulation	0.82	Reliable
Novelty	0.65	Reliable

From Table 1, it is found that perspicuity, dependability, and novelty are not reliable. This is because several respondents provide inconsistent answers to the questions given. Appendix 6 provides an overview of some respondents who gave inconsistent answers, marked with a red marker. Therefore, some data from respondents who gave inconsistent answers more than one must be deleted, so reliable questionnaire results are obtained, as shown in Table 2.

From the respondents' answers to each question, the mean, variance, and standard deviation were calculated for the 26 question items in the UEQ. Each question is colour-coded according to its group: attractiveness, clarity, efficiency, accuracy, stimulation, and novelty. The average value > 0.8 represents a positive evaluation (green arrow), an average value < -0.8 represents a negative evaluation (red arrow), and if the average is between positive and negative values, it represents the value-neutral (yellow arrow) as shown in Figure 4.

Item	Mean	Variance	Std. Dev	No.	Left	Right	Scale	
1	0,2	1,7	1,3	57	annoying	enjoyable	Attractiveness	
2	0,1	1,6	1,2	57	not understandable	understandable	Perspicuity	
3	-0,5	1,8	1,3	57	creative	dull	Novelty	
4	0,6	2,2	1,5	57	easy to learn	difficult to learn	Perspicuity	
5	0,1	2,4	1,6	57	valuable	inferior	Stimulation	
6	-0,2	1,5	1,2	57	boring	exciting	Stimulation	
7	0,2	1,5	1,2	57	not interesting	interesting	Stimulation	
8	-0,3	1,1	1,0	57	unpredictable	predictable	Dependability	
9	0,0	1,4	1,2	57	fast	slow	Efficiency	
10	-0,2	0,8	0,9	57	inventive	conventional	Novelty	
11	0,2	1,9	1,4	57	obstructive	supportive	Dependability	
12	0,7	1,7	1,3	57	good	bad	Attractiveness	
13	0,0	1,6	1,2	57	complicated	easy	Perspicuity	
14	0,3	1,2	1,1	57	unlikable	pleasing	Attractiveness	
15	0,1	0,8	0,9	57	usual	leading edge	Novelty	
16	0,4	1,7	1,3	57	unpleasant	pleasant	Attractiveness	
17	0,3	0,9	0,9	57	secure	not secure	Dependability	
18	0,0	1,1	1,0	57	motivating	demotivating	Stimulation	
19	-0,2	1,1	1,1	57	meets expectations	does not meet expectations	Dependability	
20	0,2	1,6	1,3	57	inefficient	efficient	Efficiency	
21	-0,1	1,3	1,1	57	clear	confusing	Perspicuity	
22	0,6	1,0	1,0	57	impractical	practical	Efficiency	
23	0,3	1,6	1,3	57	organized	cluttered	Efficiency	
24	0,2	1,3	1,1	57	attractive	unattractive	Attractiveness	
25	0,6	1,5	1,2	57	friendly	unfriendly	Attractiveness	
26	0,5	1,1	1,1	57	conservative	innovative	Novelty	

Figure 4 Results of Mean, Variance, and Standard Deviation of UEQ Answers.

Then an evaluation of the average user experience questionnaire scale for online lectures will be carried out. The results of the average UEQ scale can be seen in Table 3. This table shows the average value of all question items according to the group. Average attractiveness, clarity, efficiency, accuracy, stimulation, and novelty get neutral values.

Table 3. UEQ Scales (Mean and Variance)

UEQ Scales (Mean and Variance)		
Attractiveness	0.415	0.91
Perspicuity	0.123	0.87
Efficiency	0.276	0.79

UEQ Scales (Mean and Variance)		
Dependability	0.004	0.60
Stimulation	0.044	1.03
Novelty	-0.018	0.55

Figure 5 shows the results of testing the five aspects of the UEQ that are positive and one aspect is negative. This is because the test results for the five aspects are above the 0 scale, and one aspect is below 0. Then the average data for each of the six aspects of the UEQ scale is then compared with other products contained in the benchmark. The comparison results can be seen in Table 4 and Figure 6.
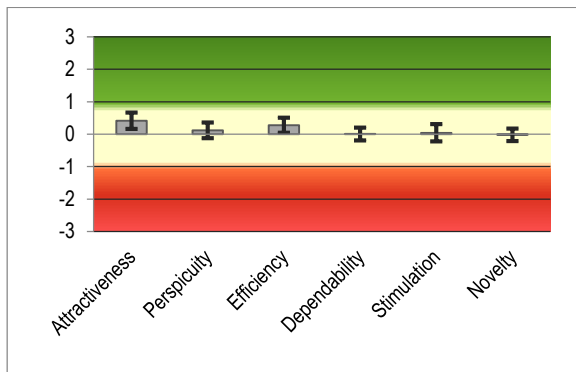

Figure 5. Test results of six aspects of UEQ

The benchmark comparison is said to be perfect if it has a mean value > 1.86, good if it has a mean value >

1.6, above the average if it has a value > 1.19, below the average if it has a mean value > 0.7, while bad if it has a value < 0.7.
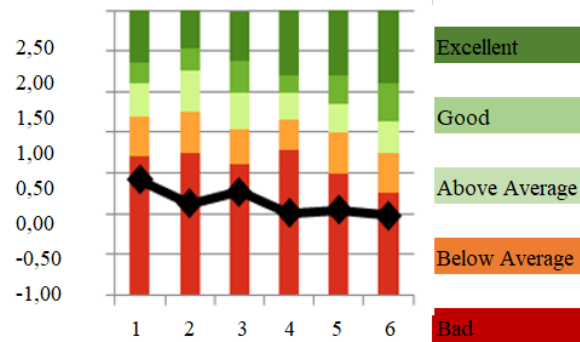

1. Atractiveness
2. Perspicuity
3. Efficiency
4. Dependability
5. Stimulation
6. Novelty

Figure 6. Benchmark of e-learning.

Table 4 shows that the product of e-learning kuliahdaring.ung.ac.id has a poor benchmark comparison.

Table 4. Comparison of UNG e-learning with other applications in the benchmark

Scale	Mean	Comparison to benchmark	Interpretation
Attractiveness	0.42	Bad	In the range of the 25% worst results
Perspicuity	0.12	Bad	In the range of the 25% worst results
Efficiency	0.28	Bad	In the range of the 25% worst results
Dependability	0.00	Bad	In the range of the 25% worst results
Stimulation	0.04	Bad	In the range of the 25% worst results
Novelty	-0.02	Bad	In the range of the 25% worst results

3.2 Discussion

From the results of measuring the quality of the application, the average value of the application seen from the six aspects is between -0.8 and 0.8. This shows that the average respondent gives neutral answers to each question in the UEQ questionnaire, as shown in table 3 and illustrated in figure 2. If the average value of the answers obtained is > 0.8, then the average respondent gives a positive answer, but if the average answer given is < -0.8, then the average respondent gives a negative answer. When comparing this e-learning application with other applications on the benchmark, the e-learning application of kuliahdaring.ung.ac.id, on average, gets poor results (see Figure 3).

Judging from the Attractiveness aspect of the user's overall impression of this e-learning application, users show the impression that they are not interested in using this application. Judging from the Perspicuity aspect, this application is unfamiliar to users and is not easy to learn. The efficiency of this e-learning application makes users need more effort to work on their problems, and this application is not fast in solving user problems. The dependability of this e-learning application does not feel in control of interaction with the application. This e-learning application is not fun and motivates users to use it, or the Stimulation aspect is not felt. The novelty or novelty of this e-learning application is seen from the design that is not creative and gives a sense of interest to the user.

4. CONCLUSION

Based on the research conducted, the following conclusions were obtained:

1. The e-learning application Kampusdaring.ung.ac.id is an application that is needed to help students learn independently, according to their respective learning styles and speeds.

2. The results of the UEQ calculation for the Kampusdaring.ung.ac.id application is seen from six aspects, showing the respondents' average value of the answers is between -0.8 and 0.8, which means that the respondents gave neutral answers.

3. The comparison of the quality of the e-learning application of Kampusdaring.ung.ac.id compared to other products on the benchmark shows that this application gets a bad score from six aspects.

4. It is necessary to improve the quality of the e-learning application of Kampusdaring.ung.ac.id for all aspects so that the user experience of this e-learning application can improve. As for improving what features are needed in the application, further measurements are needed using other methods

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