

# PBM E-Questionnaire: Application Development and UI / UX Analysis

Fajril Pratama Kadri <sup>1\*</sup>, Evaluata Br. Sembiring <sup>2\*\*</sup>

\* Informatics Engineering, Batam State Polytechnic

\*\* Network Multimedia Engineering, Batam State Polytechnic  
[mynamefajril@gmail.com](mailto:mynamefajril@gmail.com) <sup>1</sup>, [eva@polibatam.ac.id](mailto:eva@polibatam.ac.id) <sup>2</sup>

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## ABSTRACT

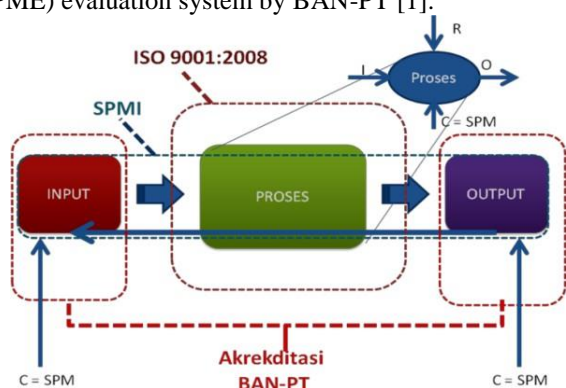
Batam State Polytechnic declares itself as a tertiary institution which is very concerned about the quality of its education. This achievement was reported through the implementation of an education quality assurance system through study programs accredited by BAN-PT. One of the quality assurance services for education is through feedback studies on learning services through study programs. Almost every year in Batam State Polytechnic, study programs apply for accreditation to BAN-PT. Then along with these activities needed data quickly and completely. However, in reality, it is not uncommon for the drafting team to experience obstacles in obtaining the data. Based on this, in this study, an electronic PBM questionnaire application was made from several parties including lecturers, students, alumni, and alumni users (stakeholders). Making an application using the Research and Development (RnD) method and analysis in the Interface and Experience section. The results of the study with the average achievement percentage reached 88.3% showed that the user interface of the E-Questionnaire website application was very well received by the user.



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## I. INTRODUCTION

Batam State Polytechnic declares itself as a tertiary institution which is very concerned about the quality of its education. This achievement was reported through the implementation of an education quality assurance system including BAN-PT accredited study programs since its foundation. ISO-based Higher Education Quality Management System and Internal Quality Education System (SPMI) through the External Quality Assurance System (SPME) evaluation system by BAN-PT [1].



Gambar 1. External Quality Assurance System

One of the education quality assurance services is through a survey of the quality of learning services through study programs. A study program is a unit that implements the teaching and learning process. In Batam State Polytechnic, the study program manager is expected to be able to evaluate PBM (Teaching and Learning Process) every semester to ensure the implementation of teaching and learning is monitored and evaluated periodically. It aims to improve the quality of PBM systematically. In Batam State Polytechnic, PBM evaluates 4 times in one semester. The components as PBM material generally consist of: (1) Regarding students (in the form of Student Warning Letter and withdrawals, and others); (2) The presence of lecturers, the achievement of the material, and student questionnaires; (3) Trusteeship Data, Internship and Final Project.

One important part that needs to be analyzed is the response of parties related to the PBM process such as lecturers (lecturers), students, alumni, and users of graduates. Based on the results of the analysis, it is hoped that important information will be obtained to improve the quality of PBM.

**C. Umpan Balik \*\*)**  
 Jika program studi melakukan kajian tentang proses pembelajaran melalui umpan balik dari dosen, mahasiswa, alumni, dan pengguna lulusan mengenai harapan dan persepsi mereka, tuliskan isi umpan balik dan tindak lanjutnya.

Umpan Balik dari (1)	Isi Umpan Balik (2)	Tindak Lanjut (3)
Dosen		
Mahasiswa		
Alumni		
Pengguna lulusan		

\*\*) untuk laporan PBM IV

Gambar 2. Feedback Table

Another interest in this questionnaire data is for the submission of study program accreditation. The required questionnaire data is the same as the PBM Batam Polytechnic report. The value points obtained from this data are 1.36.

8	2.5	Umpan balik untuk peningkatan mutu proses pembelajaran. Informasi mencakup sumber umpan balik, keberlanjutan pelaksanaan, dan tindak lanjutnya.		1.36	
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No. Urut	No. Butir	Elemen Penilaian	Informasi dari Borang PS	Bobot Butir	Nilai
		balik, keberlanjutan pelaksanaan, dan tindak lanjutnya.			

Gambar 3. PBM Batam Polytechnic State Report Table

Almost every year, study programs apply for accreditation from BAN-PT. Then along with these activities needed data quickly and completely. However, in reality, it is not uncommon for the drafting team to experience obstacles in obtaining the data. Possible factors for the existence of these constraints are the lack of good management of data storage related to the activities that have been carried out so that when the data is needed, a search or processing is carried out which results in inadequate data obtained making it difficult for the team to carry out its work, and so on.

Based on this, in this study, an electronic PBM questionnaire application was made from several parties including lecturers, students, alumni, and alumni users (stakeholders). Web-based applications that have responsive capabilities. Generally, someone when confronted with data entry (more precisely a questionnaire), gives an unfavorable impression. This is likely due to the large number of points that must be filled, difficult to fill in, media filling constraints, busyness reasons, media, and others. Therefore, through this application, it will be equipped with features to process the data and then it can be reviewed as a learning evaluation material implemented by the study program. It is expected that through this application and also the direct application to become tools (tools) for the management of study programs at the Batam State Polytechnic to conduct periodic and systematic reviews of the questionnaire. Data needed for other purposes such as accreditation can also be easily and quickly provided.

Therefore, in this research the making of an application uses the Research and Development (RnD) method and analysis in the Interface and Experience section.

## II. LITERATURE REVIEW

Research on web-based systems, especially for academic activities, has been widely carried out, one of which is making applications of web-based fieldwork information systems to assist the process of street vendors activities [16]. Next is about making a website application to manage data in the implementation of an internship at the Batam State Polytechnic [14].

Web application development methods used have many types, such as the waterfall method, while building applications generally focus on the method of testing performed. One of the testing methods used is like the BlackBox method. Other testing methods can use the Heuristic Evaluation method. This method is generally used to analyze the UI and UX of a website [4]. The following details the comparative research that has been done before in Table I.

TABLE I  
RESEARCH COMPARISON

No	Author (Year)	Title	Research Result	Product Produced
1.	S. Thya Safitri dan Didi Supriyadi (2015)	Design of Web-Based Job Training Information System Using the Waterfall Method.	Helping the process of street vendors at Telkom College ST3 Purwokerto previously still using manual methods, some states still require a long time to process.	Website Application
2.	Firchan Risanto (2016)	Batam State Polytechnic Internship Management Application	Producing application products as a place to manage data on internships.	Website Application
3.	Yemima Monica Geasela, Pranchis Ranting, dan Johannes Fernandes Andry (2018)	Evaluating the interface design of an e-learning based website using human factors and ergonomic interpretation approaches, to improve the usability and usefulness of a system.	Generate an analysis of UPKu Restu's information system design using a web-based application.	Website Application

## III. RESEARCH METHODS

The research method used in making this application is the RnD method, while for product analysis using the heuristic evaluation method.

### A. RnD Method

R & D research is used when research produces products and tests. There are 4 main stages in the study, among others:

- 1) Problem Definition or Product Needs, at this stage a feedback application needs analysis is performed.

- 2) Product Design, web-based application design based on the need for applications as tools to help study program managers in processing PBM feedback data.
- 3) Product Development, application development is based on design results.
- 4) Distribution of products (feasibility of ready-to-use products), it is certain that the application is ready for use and the first test is using PBM data for odd semester 2019-2020, so that it can be reviewed by the study program manager.

**B. Heuristic Evaluation Method**

The quality of the feasibility of a website can be known through the evaluation process, one of the evaluation processes that can be done is usability evaluation which is a solution to find out the usability problem. For the system to achieve certain objectives effectively, efficiently, and achieve user satisfaction requires usability evaluation. One of them is a Heuristic evaluation (HE). HE is a usability inspection to effectively improve a design by using a set of related heuristics. The process of HE allows a set of evaluators who independently evaluate and assess the system of each heuristic that will show usability problems [2].

**C. Likert Scale**

Likert Scale is a conventional and popular psychometric scale applied in conducting research surveys. Likert scale is used in measuring the behavior, perceptions, and responses of individuals and groups of people relevant to the subject of social cases [17]. Regarding the Likert Scale as the answer choices for respondents and the value of each choice can be seen in Table III.

TABLE II  
LIKERT SCALE CONCEPT

Answer	Value
Very Agree / Very Satisfied / Very Good	1
Agree / Satisfied / Good	2
Doubtful / Neutral / Enough	3
Disagree / Not Satisfied / Not Good Enough	4
Strongly Disagree / Very Dissatisfied / Not Very Good	5

The steps to calculate the results of data processing are as follows:

1. Calculate the total score. The total score is calculated using the formula (1) based on a Likert scale.
 
$$Total\ Score = T \times Pn \tag{1}$$

T = Total number of respondents.  
Pn = Choice of Likert score.
2. Calculate the percentage index. After the total score is obtained, the next thing to do is determine the lowest

score using formula (2) and determine the index in percent using formula (3).

$$Y = Highest\ Likert\ Score \times T \tag{2}$$

Y = Lowest score

$$Index\ \% = \frac{Total\ Score}{Y} \times 100 \tag{3}$$

Index % = index in percent

3. Calculate the interval. After the index calculation is obtained, the next thing to do is to evaluate with the final value and be referred to at the interval. Determine the index interval using the formula (4).

$$I = \frac{100}{Total\ Score\ (likert)} \tag{4}$$

I = Percent Score Interval

With a total of five Likert scores, the index intervals can be calculated and produce the following intervals:

1. Index figures 0% -19.99% = Strongly Disagree
2. Index figures 20% -39.99% = Disagree
3. Index figures 40% -59.99% = Doubtful
4. Figures index 60% -79.99% = Agree
5. Index figures 80% -100% = Strongly Agree[8]

**IV. RESULTS AND DISCUSSION**

**A. Implementation**

This section will explain the implementation of the functional system that has been successfully carried out consisting of 6 functional.

*1) Implement logins, change passwords, and forget passwords (F01)*

The login process is carried out if the user has entered data in the form of a username and password on the login form and then presses the login button, then the system will read the data in the database whether the user data is appropriate or not. The process of changing the password is done if the user has logged in to the application. The user enters data in the form of a new password on the form change password then the user presses the submit button, then the system will update the user's data in the database. The process of forgetting the password is done if the user has entered data in the form of an email on the forgotten password form then the user presses the submit button, then the system will read the data in the database whether it is suitable or not. Then the user will be transferred to the new password creation page after the user fills in the new password data, the system will then update the user data in the database.

*2) Implementation Admin can manage (add, edit, delete) accounts (F02)*

In this section after the admin login to the application, then the admin goes to the user settings page and then the admin presses the add user button. Then the admin is required to fill in the data in the form of the name, username, email, password, and user level on the form added by the user then the admin presses the add user button. Then the system will store user data into a database. The user editing process is done if the admin has selected the user who wants to be changed then pressing the edit button on the user list, then the admin enters the data in the form of the name, username, email, password and user level on the user edit form then the admin presses the user edit button. Then the system will update user data into the database. The delete user process is done if the admin has selected the user who wants to be deleted then pressing the delete button, then the system will delete the user from the database.

3) *Implementation Admin can manage (add, edit, delete) questionnaire (F03)*

In this section after the admin has logged in to the application, then the admin enters the question set page then the admin presses the add question button. Then the admin is required to fill in the data in the form of questions, user level, and user objectives on the form added questions then the admin presses the add question button. Then the system will store the question data into the database. The question editing process is done if the admin has selected the question that you want to change, then presses the edit button on the question list, then the admin enters the form of data in the form of questions, user level, and user destination in the next question edit form the admin presses the question edit button. Then the system will update the question data into the database. The delete question process is done if the admin has selected the question you want to delete then press the delete button, then the system will delete the question from the database.

4) *Implementation Admin can manage (add, edit, delete) parameters (F04)*

In this section after the admin has logged in to the application, then the admin enters the parameter management page and then the admin presses the add parameter button. Then the admin is required to fill in the data in the form of a parameter name on the form plus parameter then the admin presses the add parameter button. Then the system will store parameter data into the database. The parameter editing process is done if the admin has selected the parameters to be changed and then presses the

edit button in the parameter list, then the admin enters the data in the form of a parameter name on the parameter edit form then the admin presses the parameter edit button. Then the system will update the parameter data into the database. The delete parameter process is done if the admin has selected the parameters that you want to delete then press the delete button, then the system will delete the parameters from the database.

5) *User Implementation (students, lecturers, alumni, graduate users) can fill out questionnaires based on their respective access rights (F05)*

In this section after the user has logged in to the application, then the user enters the questionnaire contents page then the user enters the questionnaire data, and the next parameter the user presses the submit button. Then the system will store the questionnaire data into the database.

6) *User Implementation (admin, lecturer, company) can see the questionnaire diagram (F06)*

In this section after the user has logged in to the application, then the user enters the main page. Then the system reads the data in the database and converts it in a form.

B. *Testing*

1) *Alpha Testing*

This test is an application test by the application developer. This test is done in a BlackBox to test the successful implementation of functional requirements. 6 functionalities have been successfully implemented and tested.

2) *Beta Testing*

Testing this stage is the process of evaluating the user interface of the website that will be carried out by users using Heuristic evaluation. Testing will be given to 30 respondents, namely students, lecturers, and alumni using a Likert scale. Questionnaire data results from 30 respondents taken from 23 students, 3 lecturers, 6 alumni in detail:

TABLE III  
USER QUESTIONNAIRE

He	Question	STS	TS	RG	S	SS
H1.1	There was a message when the login was unsuccessful.	0	0	2	13	15
H1.2	There is a message when not filling	0	0	1	13	16

He	Question	STS	TS	RG	S	SS
	data correctly and or completely.					
H2.1	The language used in the application is easy to understand.	0	0	1	14	15
H2.2	How to use the application is easy to do.	0	0	1	16	13
H3.1	Given the freedom to access features to return.	0	0	1	17	12
H3.2	Navigation on the application is easy to use.	0	0	0	17	13
H4.1	The appearance of the application interface is consistent between pages.	0	0	1	14	15
H5.1	The application can display messages when there are errors or errors in using the application.	0	0	0	16	14
H6.1	The recommended feature is to confirm the work you want to do on the application (example: delete data, edit data, etc.).	0	0	2	17	11
H6.2	The feature returns to the main menu without having to repeat the process that has been passed (for example: when the contents are not finished, there is no need to press the back button repeatedly / undo function).	0	0	3	14	13
H7.1	Quick response in opening applications.	0	0	0	13	17
H7.2	Quick response in selecting menu choices in the application.	0	0	1	13	16

He	Question	STS	TS	RG	S	SS
H8.1	Display responsive application.	0	0	0	15	15
H8.2	Display dynamic applications.	0	0	0	17	13
H8.3	Display proportional font size and line-height.	0	0	0	15	15
H8.4	The color display of the application is very interesting	0	0	0	20	10
H8.5	Aesthetic display of up-to-date designs.	0	0	1	19	10
H8.6	The display is easy to read, understand and understand	0	0	1	18	11
H9.1	The application provides a solution when an error occurs.	0	0	1	19	10
H10.1	The application provides help features.	0	0	2	15	13

The score on each of the statements above will be calculated using the formula of the total score, ie the score of the number of respondents who chose multiplied by the choice of the Likert score. Following the calculation of the questionnaire from the test results in detail:

- 1) Statement H1.1 "There was a message when the login was not successful".

The calculated Likert Score on the H1.1 statement is presented in the following table IV:

TABLE IV  
CALCULATION RESULTS H1.1

Test Questions and Results					
Questions	There was a message when the login was unsuccessful.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	2	13	15
Total Respondents	30				
Total	$(0*1) + (0*2) + (2*3) + (13*4) + (15*5) = 133$				
Likert score	$(133/150) * 100 = 88.67\%$				

Based on the calculation of the Likert score in the H1.1 calculation table, the value of the percentage of user satisfaction with the appearance of the application reached 88.67% which means the user strongly agrees

with the statement "There is a message when the login is not successful".

- 2) Statement H1.2 "There is a message when not filling data correctly and or completely".  
The calculated Likert score on the H1.2 statement is presented in the following Table V:

TABLE V  
CALCULATION RESULTS H1.2

Test Questions and Results					
Questions	There is a message when not filling data correctly and or completely.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	13	16
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (13*4) + (16*5) = 135$				
Likert score	$(135/150) * 100 = 90\%$				

Based on the calculation of the Likert score in the H1.2 calculation table, the value of the percentage of user satisfaction with the appearance of the application reaches 90% which means the user strongly agrees with the statement "There is a message when not filling data correctly and or completely".

- 3) Statement H2.1 "The language used in the application is easy to understand".  
The calculated Likert score on the H2.1 statement is presented in Table VI below:

TABLE VI  
CALCULATION RESULTS H2.1

Test Questions and Results					
Questions	The language used in the application is easy to understand.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	14	15
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (14*4) + (15*5) = 134$				
Likert score	$(134/150) * 100 = 89,33\%$				

Based on the calculation of the Likert score in the H2.1 calculation table, the percentage value of user satisfaction with the application display reaches 89.33% which means the user strongly agrees with the statement "The language used in the application is easy to understand".

- 4) Statement H2.2 "How to use the application is easy to do".  
The Likert score results in the H2.2 statement are presented in Table VII below:

TABLE VII  
CALCULATION RESULTS H2.2

Test Questions and Results					
Questions	How to use the application is easy to do				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	16	13
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (16*4) + (13*5) = 132$				
Likert score	$(132/150) * 100 = 88\%$				

Based on the calculation of the Likert score in the H2.2 calculation table, the value of the percentage of user satisfaction with the appearance of the application reaches 88% which means the user strongly agrees with the statement "How to use the application is easy to do".

- 5) Statement H3.1 "Given the freedom to access the feature to return".  
The results of calculating the Likert score in statement H3.1 are presented in the following Table VIII:

TABLE VIII  
CALCULATION RESULTS H3.1

Test Questions and Results					
Questions	Given the freedom to access features to return.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	17	12
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (17*4) + (12*5) = 131$				
Likert score	$(131/150) * 100 = 87,33\%$				

Based on the calculation of the Likert score in the calculation table H3.1, the value of the percentage of user satisfaction with the display application reaches 87.33% which means the user strongly agrees with the statement "Given the freedom in accessing features to return".

- 6) Statement H3.2 "Navigation in the application is easy to use".  
The results of calculating the Likert score in statement H3.2 are presented in the following Table IX:

TABLE IX  
CALCULATION RESULTS H3.2

Test Questions and Results					
Questions	Navigation on the application is easy to use.				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	0	17	13
Total Respondents	30				

Test Questions and Results					
Questions	Navigation on the application is easy to use.				
Value	ST S	TS	RG	S	SS
Total	$(0*1) + (0*2) + (0*3) + (17*4) + (13*5) = 133$				
Likert score	$(133/150) * 100 = 88,67\%$				

Based on the calculation of the Likert score in the H3.2 calculation table, the value of the percentage of user satisfaction with the application display reaches 88.67% which means the user strongly agrees with the statement "Navigation on the application is easy to use".

- 7) Statement H4.1 "Appearance of the application interface is consistent between pages".  
The results of calculating the Likert score in statement H4.1 are presented in the following Table X:

TABLE X  
CALCULATION RESULTS H4.1

Test Questions and Results					
Questions	The appearance of the application interface is consistent between pages.				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	1	14	15
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (14*4) + (15*5) = 134$				
Likert score	$(134/150) * 100 = 89,33\%$				

Based on the calculation of the Likert score in the calculation table H4.1, the value of the percentage of user satisfaction with the application display reaches 89.33% which means the user strongly agrees with the statement "Display the application interface is consistent between pages".

- 8) Statement H5.1 "The application can display a message when there is an error or error in using the application".  
The results of calculating the Likert score in statement H5.1 are presented in the following Table XI:

TABLE XI  
CALCULATION RESULTS H5.1

Test Questions and Results					
Questions	The application can display messages when there are errors or errors in using the application.				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	0	16	14
Total Respondents	30				
Total	$(0*1) + (0*2) + (0*3) + (16*4) + (14*5) = 134$				
Likert score	$(134/150) * 100 = 89,33\%$				

Based on the calculation of the Likert score in the calculation table H5.1, the value of the percentage of user satisfaction with the application display reaches 89.33% which means the user strongly agrees with the statement "The application can display messages when there are errors or errors in the use of the application".

- 9) Statement H6.1 "There are recommended features to confirm the work you want to do on the application (example: delete data, edit data, etc.)".  
The results of calculating the Likert score in statement H6.1 are presented in the following Table XII:

TABLE XII  
CALCULATION RESULTS H6.1

Test Questions and Results					
Questions	The recommended feature is to confirm the work you want to do on the application (example: delete data, edit data, etc.).				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	2	17	11
Total Respondents	30				
Total	$(0*1) + (0*2) + (2*3) + (17*4) + (11*5) = 129$				
Likert score	$(129/150) * 100 = 86\%$				

Based on the calculation of the Likert score in the calculation table H6.1, the value of the percentage of user satisfaction with the appearance of the application reaches 86% which means the user strongly agrees with the statement "There are recommended features to confirm the work to be done on the application (example: delete data, edit data, and others)".

- 10) Statement H6.2 "There is a feature to return to the main menu without having to repeat the process that has been passed (for example: when the contents fill out but not finished, there is no need to press the back button repeatedly / undo function)".  
The calculated Likert score on statement H6.2 is presented in the following Table XIII:

TABLE XIII  
CALCULATION RESULTS H6.2

Test Questions and Results					
Questions	The feature returns to the main menu without having to repeat the process that has been passed (for example: when the contents are not finished, there is no need to press the back button repeatedly / undo function).				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	3	14	13
Total Respondents	30				
Total	$(0*1) + (0*2) + (3*3) + (14*4) + (13*5) = 130$				
Likert score	$(130/150) * 100 = 86,67\%$				

Based on the calculation of the Likert score in the calculation table H6.2, the value of the percentage of user satisfaction with the application display reaches 86.67% which means the user strongly agrees with the statement "The feature returns to the main menu without having to repeat the process that has been passed (example: when filling out the questionnaire but not finished, no need to press the back button repeatedly / undo function)".

- 11) Statement H7.1 "Quick response to opening applications".  
The results of calculating the Likert score in statement H7.1 are presented in the following Table XIV:

TABLE XIV  
CALCULATION RESULTS H7.1

Test Questions and Results					
Questions	Quick response in opening applications.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	0	13	17
Total Respondents	30				
Total	$(0*1) + (0*2) + (0*3) + (13*4) + (17*5) = 137$				
Likert score	$(137/150) * 100 = 91,33\%$				

Based on the calculation of the Likert score in the calculation table H7.1, the value of the percentage of user satisfaction with the application display reaches 91.33% which means the user strongly agrees with the statement "Quick response in opening applications".

- 12) Statement H7.2 "Quick response when selecting menu options in the application".  
The calculated Likert score on statement H7.2 is presented in the following Table XV:

TABLE XV  
CALCULATION RESULTS H7.2

Test Questions and Results					
Questions	Quick response in selecting menu choices in the application.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	13	16
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (13*4) + (16*5) = 135$				
Likert score	$(135/150) * 100 = 90\%$				

Based on the results of the Likert score calculation in the H7.2 calculation table, the value of the percentage of user satisfaction with the application display reaches 90% which means the user strongly agrees with the statement "Quick response in selecting menu choices in the application".

- 13) Statement H8.1 "Display responsive application".  
The results of calculating the Likert score in statement H8.1 are presented in the following Table XVI:

TABLE XVI  
CALCULATION RESULTS H8.1

Test Questions and Results					
Questions	Display responsive application.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	0	15	15
Total Respondents	30				
Total	$(0*1) + (0*2) + (0*3) + (15*4) + (15*5) = 135$				
Likert score	$(135/150) * 100 = 90\%$				

Based on the calculation of the Likert score in the calculation table H8.1, the value of the percentage of user satisfaction with the application display reaches 90% which means the user strongly agrees with the statement "Display responsive application".

- 14) Statement H8.2 "Display dynamic applications".  
The calculated Likert score on statement H8.2 is presented in the following Table XVII:

TABLE XVII  
CALCULATION RESULTS H8.2

Test Questions and Results					
Questions	Display dynamic applications.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	0	17	13
Total Respondents	30				
Total	$(0*1) + (0*2) + (0*3) + (17*4) + (13*5) = 133$				
Likert score	$(133/150) * 100 = 88,67\%$				

Based on the calculation of the Likert score in the calculation table H8.2, the value of the percentage of user satisfaction with the application display reaches 88.67% which means the user strongly agrees with the statement "Display dynamic applications".

- 15) Statement H8.3 "Display proportional font size and line-height".  
The results of calculating the Likert score in statement H8.3 are presented in the following Table VIII:

TABLE XVIII  
CALCULATION RESULTS H8.3

Test Questions and Results					
Questions	Display proportional font size and line-height.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	0	15	15
Total Respondents	30				



Test Questions and Results					
Questions	Display proportional font size and line-height.				
Value	STS	TS	RG	S	SS
Total	$(0*1) + (0*2) + (0*3) + (15*4) + (15*5) = 135$				
Likert score	$(135/150) * 100 = 90\%$				

Based on the calculation of the Likert score in the calculation table H8.3, the value of the percentage of user satisfaction with the application display reaches 90%, which means the user strongly agrees with the statement "Display proportional font size and line-height".

- 16) Statement H8.4 "The application's color display is very attractive".  
The results of calculating the Likert score in statement H8.4 are presented in the following Table XIX:

TABLE XIX  
CALCULATION RESULTS H8.4

Test Questions and Results					
Questions	The color display of the application is very interesting				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	0	20	10
Total Respondents	30				
Total	$(0*1) + (0*2) + (0*3) + (20*4) + (10*5) = 130$				
Likert score	$(130/150) * 100 = 86,67\%$				

Based on the calculation of the Likert score in the calculation table H8.4, the value of the percentage of user satisfaction with the application display reaches 86.67% which means the user strongly agrees with the statement "Appearance of the application is very interesting".

- 17) Statement H8.5 "Display aesthetic design up-to-date".  
The results of calculating the Likert score in statement H8.5 are presented in the following XX table:

TABLE XX  
CALCULATION RESULTS H8.5

Test Questions and Results					
Questions	Aesthetic display of up-to-date designs.				
Value	ST S	TS	RG	S	SS
Number of Respondents	0	0	1	19	10
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (19*4) + (10*5) = 129$				
Likert score	$(129/150) * 100 = 86\%$				

Based on the calculation of the Likert score in the calculation table H8.5, the value of the percentage of user satisfaction with the application display reaches

86%, which means the user strongly agrees with the statement "Display aesthetic design up-to-date".

- 18) Statement H8.6 "Display is easy to read, understand and understand".  
The results of calculating the Likert score in statement H8.6 are presented in the following Table XXI:

Table XXI  
Calculation Results H8.6

Test Questions and Results					
Questions	The display is easy to read, understand and understand				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	18	11
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (18*4) + (11*5) = 130$				
Likert score	$(130/150) * 100 = 86,67\%$				

Based on the calculation of the Likert score in the calculation table H8.6, the value of the percentage of user satisfaction with the application display reaches 86.67% which means that the user strongly agrees with the statement "The display is easy to read, understand and understand".

- 19) Statement H9.1 "The application provides a solution when an error occurs".  
The results of calculating the Likert score in statement H9.1 are presented in the following Table XXII:

TABLE XXII  
CALCULATION RESULTS H9.1

Test Questions and Results					
Questions	The application provides a solution when an error occurs.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	1	19	10
Total Respondents	30				
Total	$(0*1) + (0*2) + (1*3) + (19*4) + (10*5) = 129$				
Likert score	$(129/150) * 100 = 86\%$				

Based on the calculation of the Likert score in the calculation table H9.1, the value of the percentage of user satisfaction with the application display reaches 86%, which means the user strongly agrees with the statement "The application provides a solution when an error occurs".

- 20) Statement H10.1 "The application provides help features".  
The results of calculating the Likert score in statement H10.1 are presented in the following XXIII table:

TABLE XXIII  
CALCULATION RESULTS H10.1

Test Questions and Results					
Questions	The application provides help features.				
Value	STS	TS	RG	S	SS
Number of Respondents	0	0	2	15	13
Total Respondents	30				
Total	$(0*1) + (0*2) + (2*3) + (15*4) + (13*5) = 131$				
Likert score	$(131/150) * 100 = 87,33\%$				

Based on the calculation of the Likert score in the calculation table H10.1, the value of the percentage of user satisfaction with the application display reaches 87.33% which means the user strongly agrees with the statement "Application provides help features".

## V. CONCLUSION

The conclusion that can be drawn from this study is the E-Questionnaire website application can produce PBM questionnaire instruments (lecturers, students, alumni, and users of graduates/stakeholders) that are easy to use by respondents. E-Questionnaire website application can produce data that is used for PBM data processing that is responsive using Bootstrap Framework and CSS with Research and Development methods. All percentage interval indexes in the Heuristic Evaluation analysis model reach the category of strongly agree (H1.1: 88.67%, H1.2: 90%, H2.1: 89.33, H2.2: 88%, H3.1: 87 33% H3.2: 88.67% H4.1: 89.33% H5.1: 89.33% H6.1: 86% H6.2: 86.67% H7.1 : 91.33%, H7.2: 90%, H8.1: 90%, H8.2: 88.67%: H8.3: 90%, H8.4: 86.67%, H8.5: 86 %, H8.6: 86.67%, H9.1: 86%, H10.1: 87.33%). With the achievement of the average percentage of satisfaction reaching 88.3%, the user interface of the E-Questionnaire website application was very well received by the user.

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