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WEBSITE EVALUATION OF THE FACULTY OF INDUSTRIAL TECHNOLOGY UNIVERSITAS ISLAM INDONESIA USING THE SYSTEM USABILITY SCALE METHOD

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Abstract

To maintain and improve the quality of the website of the Faculty of Industrial Technology (FTI), Universitas Islam Indonesia (UII), usability testing is performed on the website using the System Usability Scale (SUS). This study aims to evaluate usability and analyze the user experience on the FTI UII website so that the faculty can follow up on it. Respondents consisted of 41 active FTI UII students. Respondents were asked to complete scenarios on the FTI website while being watched by examiners. They then filled out the SUS questionnaire with ten statements and a Likert scale for answers. Using the SUS method, the test scores were 69.32. Based on these results, the acceptability of the FTI web is in the MARGINAL HIGH range, the adjective rating is at an OK level close to GOOD, the grade scale is in class C, and the Net Promoter Score (NPS) could be passive on website users. Based on these results, it can be concluded that the usability of the FTI UII website is acceptable to users but has not yet attained a maximum score; therefore, a user has not yet recommended the site to other users. This confirms that the FTI website requires additional enhancements.

Keywords: Usability; User Experience; Website; System Usability Scale; SUS

Abstrak

Dalam rangka menjaga dan meningkatkan kualitas website Fakultas Teknologi Industri (FTI), Universitas Islam Indonesia (UII), perlu dilakukan usability testing terhadap website tersebut menggunakan System Usability Scale (SUS). Tujuan dari penelitian ini adalah untuk mengevaluasi usability dan menganalisis user experience pada website FTI UII, sehingga dapat dilakukan tindak lanjut oleh pihak fakultas. Responden terdiri dari 41 mahasiswa aktif FTI UII. Pengujian dilakukan dengan meminta responden untuk melakukan skenario pada website FTI yang diamati langsung oleh penguji, kemudian responden mengisi kuesioner yang berisi 10 pernyataan dengan skala likert untuk jawabannya. Hasil testing dengan me withetende SUS diperoleh hasil sebesar 69,32. Berdasarkan hasil tersebut, acceptability web FTI berada pada rentang MARGINAL HIGH, adjective rating pada tingkat OK mendekati GOOD, grade scale pada kelas C, dan Net Promoter Score (NPS) berpotensi pasif pada penguna website. Berdasarkan hasil tersebut dapat disimpulkan bahwa website FTI UII memiliki usability yang sudah dapat diterima pengguna, namun belum mencapai skor maksimal, sehingga pada kondisi ini seorang pengguna belum merekomendasikannya kepada pengguna lain. Hal ini menegaskan bahwa pada website FTI masih perlu dilakukan perbaikan dan peningkatan lebih lanjut.

Kata Kunci: *Usabilitas; Pengalaman Pengguna; Website; System Usability Scale; SUS*

INTRODUCTION

The Internet plays an essential role in the rapid development of technology (Ferdiansyah et al., 2022). Utilization of the website is something that is commonly used in the internet era as it is today. The website is used as a medium for delivering information to visitors. Smartphone users, computers, or laptops connected to the internet network can surf (browse) to find the desired information (Setiawan & Widyanto, 2018). In 2011, the Directorate General of Informatics Applications, Ministry of Communication and Informatics of the Republic of Indonesia, stated that the website is one of the most visited information services by internet users in the world (Mz, 2016).

So many uses of the website, one of which is in the field of education. The website is used in colleges, schools, non-formal educational institutions, and other institutions. The purpose of its use also varies, ranging from a medium for conveying institutional profiles, supporting academic activities, promotional media, and many more.

The Faculty of Industrial Technology (FTI), Universitas Islam Indonesia (UII), is an educational institution that also uses the website to convey information to the general public, the academic community, and prospective new students. The faculty website with the address https://fit.uii.ac.id/ conveys academic information, news, services, facilities, study programs offered, accreditation, and much more. Websites must have good usability so that interactions between visitors and the website can be as spontaneous and natural as possible (Ananda Yul et al., 2020). A website must also have service standards that ensure smooth access and easy search for information users need (Aji & DPA, S.T, M.Kom, 2020).

An evaluation of the website is required to maintain and improve the quality of the FTI UII website. In this study, an evaluation was carried out from the usability side of the FTI UII website. According to Nielson (2003), the definition of usability is a quality indicator that measures how easy the interface is to use (Nielson, 2003). A well-structured system design creates an interface that users can easily interact with. A good interface can also make visitors return to the site and increase visitor satisfaction.

Conversely, if the user interface is not designed correctly, it can cause visitor dissatisfaction and frustration and make as many as 40% of visitors reluctant to return (S.Minocha, 2005), (Aprilia et al., 2015). Evaluation of a website can use several methods, such as User Experience Questionnaire (UEQ), System Usability Scale (SUS), and Heuristic Evaluation (HE). The evaluation of SUS has been done a lot before. Like the evaluation of Pondok pesantren Qodratullah website, Banyu Asin Regency, South Sumatra, involving ten respondents with heterogeneous criteria from the level of devotees, SUS score 88-grade scale is B, with excellent adjective ratings as well as acceptability including acceptable (Purwaningtias & Ependi, 2020).

Meanwhile, Intyanto et al. (2021) conducted a test using the SUS method on the campus website of the Pacitan State Community Academy, with 34 respondents scoring 60.75, with a grade D position, an adjective OK rating, and a marginally low acceptance level. A similar test on the usability of the Time Excelindo website on 40 respondents was conducted by Ramadhan et al. (2019). The test obtained a SUS score of 70.13 before the improvement recommendation. However, after receiving the SUS score recommendation, it increased by 80.3, so the grade B category, Adjective ratings are excellent, and the acceptability is acceptable. The SUS method was used in this study, and the respondents were current students at FTI UII. The goal of this study is to figure out how usable the FTI UII website is so that its level of usefulness can be determined and follow-up can be done in the future to make the FTI UII website even better.

RESEARCH METHODS

The study is done in six stages, as shown in Figure 1. The first stage is a literature review that continues determining respondents and conducting scenario testing. The next stage is testing the website, the questionnaire spread, processing and analyzing data, and then making conclusions and suggestions.

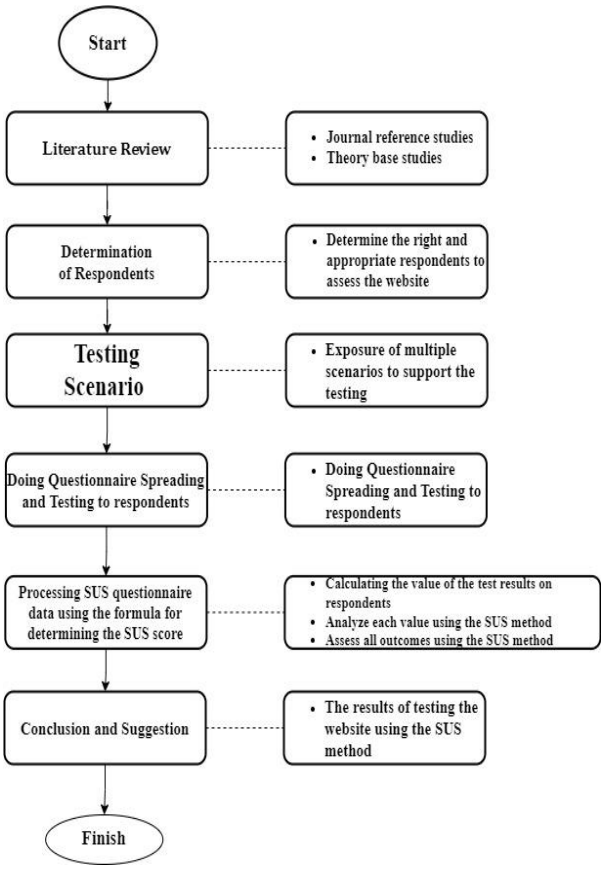

Figure 1. Research Stage

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Literature Review

A literature review is conducted to gather various previous research that has been done and various sources of scientific theory as a basis for evaluating user experience (UX) UII FTI at the website. A literature review collected the relevant usability testing, user experience testing, system usability scale, and other literature studies.

Determination of Respondents

Respondents in this study were active students of the Faculty of Industrial Technology at the Indonesian Islamic University. According to Roscoe in Sugiyono's research (Sugiyono, n.d.), the number of samples suitable (required) for research is 30-500. In this study, it was determined that the number of respondents required was 30-50 people. The criteria for respondents in this study are:

a. Active student of FTI UII,
b. I have used the website https://fit.uii.ac.id/.

Testing Scenario

At this stage, scenarios will be tested on respondents regarding several things or features found on the FTI UII website. The test scenario is as follows:

- How do I download the academic calendar on the FTI UII website? (results shown in Figure 2)
- How to access/download UTS/UAS schedule? (results shown in Figure 3)
- How to make a letter of good behavior from the faculty? (results shown in Figure 4)

Respondents were asked to find out about these things on the FTI UII website by being directly observed by the examiner to see whether the respondent could work on these scenarios smoothly or if there were any problems/confusion.

Figure 2. The page showing the academic calendar of UII

The page displayed in Figure 2 shows one of the pages available on the FTI UII website where users can access or download the 2022-2023 academic calendar. If the user can access or download the academic calendar without anyone's assistance, it is considered that he is already fluent in working on scenario 1.

Figure 3. UTS information page

The page displayed in Figure 3 shows one of the other pages available on the FTI UII website in the form of information about midterm or semester exams that will take place in the odd or even semester of the current school year. If users can access or download the info menu without anyone's help, they are fluent in working on scenario two.

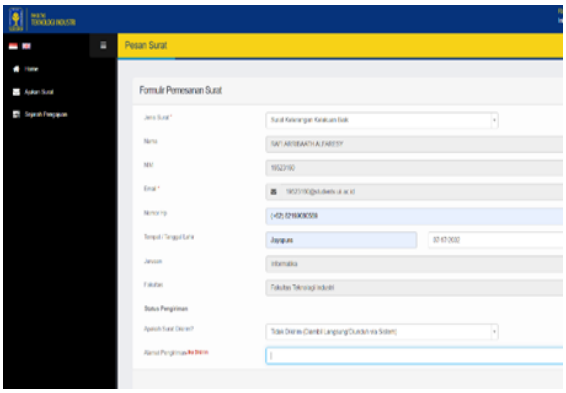

Figure 4. SISO page for writing letters of good behavior

Meanwhile, the system display in Figure 4 shows one of the systems used in FTI UII, where users can access and create letters online and independently. If the user can access and use the available system without anyone's help, they are

fluent in working on scenario three and exploring information on the FTI website.

Questionnaire Testing and Filling

Measuring usability on a website or application with the SUS method is based on the subjective point of view of the user/respondent. The use of SUS has several advantages, including:

- Test results from SUS are expressed in the form of a scale with a score range of 0-100 so that this can be applied easily (Brooke, 1996), (Brooke, 2013), (Bangor et al., 2009).
- Ependi says the SUS method calculation process is easy to understand and not complicated d (Ependi et al., 2019).
- According to Gardner, SUS can be used at no additional cost and is also free of charge (Macklin, Chris, 2020).
- According to John Brooke, SUS is generally used with a small respondent/sample size but has proven valid, consistent, or reliable (Brooke, 2013)

Research on usability testing/ evaluation using the System Usability Scale method is often used because it has characteristics/properties that differ from other questionnaires, especially those that have been validated and tested with small respondent scores (Brooke, 2013). Questionnaires with the SUS method still provide satisfactory results after considering the use of time, costs, and even in small samples.

The test scenario and SUS questionnaire in this study are shown in Figure 5. This questionnaire consists of 10 statements adapted from John Brooke's research (Brooke, 2013). Each statement has 5 Likert scale options to measure respondents' responses, (1) Strongly disagree, (2) Disagree, (3) Normal, (4) Agree, (5) Strongly agree.

Processing and Analysis of Data

The completed questionnaire was converted into a number from 1 to 100 using the SUS method. This number will determine whether the product, in this case, the FTI UII website, is appropriate or not for use (Dusea et al., 2015), (Pudjoatmodjo & Wijaya, 2016). The bigger the number generated, the better the usability. The method for assessing SUS is as follows:

Statement on odd numbers:
$(n - 1)$ ..... (1)

Statement on even numbers:
$(5 - n)$ ..... (2)

Where n is the value of each question given by the respondent.

The results of these calculations are then added up, then multiplied by the result with a value of 2.5 (Dusea et al., 2015). The calculation formula above is shown in equation (3) (Pudjoatmodjo & Wijaya, 2016).

$$\text{Score S} = (((\text{N1} - 1) + (5 - \text{N2}) + (\text{N3} - 1) + (5 - \text{N4}) + (\text{N5} - 1) + (5 - \text{N6}) + (\text{N7} - 1) + (5 - \text{N8}) + (\text{N9} - 1) + (5 - \text{N10}) * 2.5) \quad \text{.....(3)}$$

Information:
Score S = Total score of all respondents,
$N1$ s.d. $N10$ = Statement Likert value from 1 to 10 given by respondents

Next, the average calculation is carried out, whose formula is shown in equation (4).

$$\text{Average Score of SUS} = \sum_0^n \text{Score}_n \quad \text{.....(4)}$$

Based on the average score obtained, there are three perspectives or points of view in SUS when formulating evaluation results (Ependi et al., 2019), which are also shown in Figure 5:

- Acceptability consists of three levels: unacceptable, marginal (low and high), and acceptable. Acceptability is used to check the level of user acceptance of the website.
- Grade Scale (rating scale) consisting of A, B, C, D, and F is used to determine the level (grade) of the website/application.
- Adjective Rating is a hierarchy (level) of best imaginable, good, ok, poor, and worst imaginable. Adjective rating is used to determine the ranking of the website.

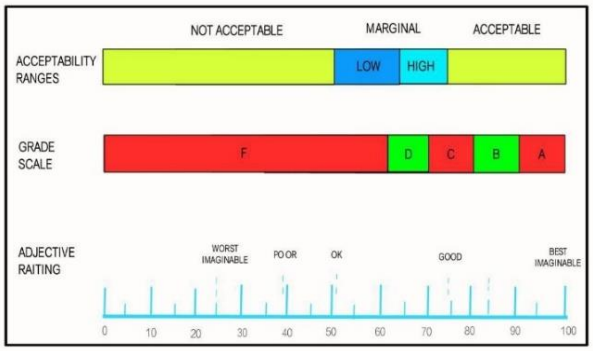

Figure 5. SUS Score (Ependi et al., 2019)

In addition, another perspective or point of view in formulating the SUS evaluation results is the SUS score percentage (SUS score percentile rank). This score contains conditions (Ependi et al., 2019):

a) Grade A = score >= 80,4
b) Grade B = score >= 74 and < 80,4
c) Grade C = score >= 68 and < 74
d) Grade D = score >= 51 and < 68
e) Grade F = score < 51

RESULTS AND DISCUSSION

The FTI UII website was tested with test scenarios and the SUS method from March 14 to April 4, 2023. Respondents who carried out the test were a total of 41 people, who were active students of FTI UII consisting of 6 majors, as shown in Table 1.

Table 1. Respondents per Departement

No	Departement	Number of responden
1	industrial engineering	8
	industrial engineering (IP)	5
2	chemical engineering	12
	chemical engineering (IP)	0
3	Informatics	9
	Informatics(IP)	0
4	electrical engineering	5
5	machine engineering	1
6	textile engineering	1
	TOTAL	**41**

Based on testing using scenarios where respondents were asked to carry out commands in that scenario, a summary of the results is shown in Table 2. Meanwhile, the results of usability testing using SUS are shown in Table 3.

Table 2. Recap Test Results with Scenarios

Results of Examiners' Observation of Scenario Work by Respondents	Scenario S1	S2	S3
Smoothly	13	28	7
be constrained	11	5	10
controlled but able to reach the goal	6	3	4
Controlled and unable to reach the goal	11	5	20
TOTAL	41	41	41

Based on Table 2, the scenarios in which respondents could not reach their goals were sorted from the highest in scenario 3, 1, and the lowest in scenario 2. While the sequence of scenarios, both smooth and constrained but respondents still able to achieve their goals, is sorted from the highest is scenario 2 (as many as 36 respondents managed to achieve the goal), the following sequence is scenario 1 (as many as 30 respondents), and the lowest is scenario 3 (as many as 21 respondents).

Table 3. FTI UII Website SUS Score

Respondent	Score SUS	Respondent	Score SUS
R1	55	R22	70
R2	57,5	R23	70
R3	67,5	R24	80
R4	75	R25	67,5
R5	77,5	R26	70
R6	57,5	R27	77,5
R7	67,5	R28	70
R8	75	R29	87,5
R9	77,5	R30	67,5
R10	67,5	R31	87,5
R11	82,5	R32	65
R12	62,5	R33	80
R13	75	R34	67,5
R14	60	R35	72,5
R15	87,5	R36	77,5
R16	45	R37	45
R17	70	R38	77,5
R18	70	R39	50
R19	65	R40	52,5
R20	67,5	R41	70
R21	75		
	average score		**69,32**

Based on Table 3, it can be seen that the SUS calculation obtains an average score of 69.32. These results are then formulated for the level of acceptability, grade scale, and adjective rating and correlate with the Net Promoter Score (NPS), as shown in Figure 7.

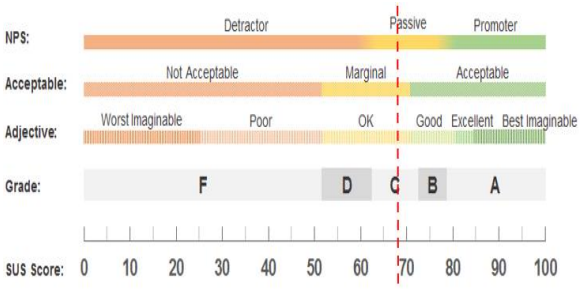

Figure 6. FTI Website SUS Score (NPS, Acceptability, Adjective, Grade Scale)

Based on the results of the formulation of the SUS score from the point of view of

acceptability, adjective rating, grade scale, and also NPS, it can be concluded that the FTI UII website for acceptability is in the MARGINAL HIGH range for adjective ratings is at the OK level (close to GOOD), and for the grade scale is at level C. Meanwhile, based on NPS, it can be passive on website users. The results of the formulation of the SUS score are shown in Table 4.

Table 4. SUS Test Results

Description	result
SUS total score	69,32
Grade Scale	C
Adjective Rating	Ok (approaching Good)
Acceptability	MARGINAL HIGH
NPS	Passive

To get a grade "A" from a website, the SUS score must be >= 80.4, while for the grade below, namely B, the SUS score is >= 74 and < 80.4. While the FTI website's SUS score based on the usability testing results obtained a score of 69.32, indicating it is in grade C. The FTI website score has usability that is acceptable to users but has yet to reach a maximum score, so in this condition, a user has not recommended it to other users. This confirms that the FTI website still needs further improvement and improvement. An analysis is carried out on each statement point on the SUS questionnaire to know the steps that can be taken. This is intended to produce recommendations to improve the SUS score.

In the SUS questionnaire, odd statements are positive statements. This means that respondents give opinions that agree or strongly agree if they support the statement. Odd statements 1, 3, 5, 7, and 9 are shown in Figures 7, 8, 9, 10, and 11.

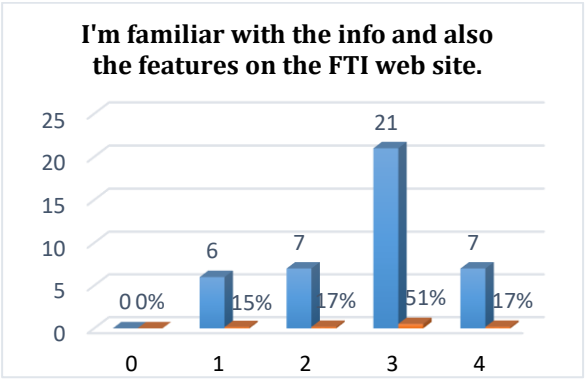

Figure 7. Results of Statement 1

Based on Figure 7, as many as 51% of respondents agree, and 17% strongly agree, that respondents are familiar with the information and features on the FTI website.

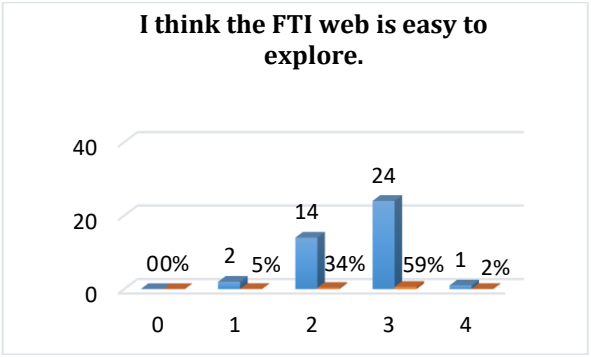

Figure 8. Results of Statement 3

Figure 8 shows that most respondents feel familiar with the information and features on the FTI UII web. Not much different: in statement 3, shown in Figure 8, as many as 59% of respondents agree, and 2% strongly agree that the FTI web is easy to navigate.

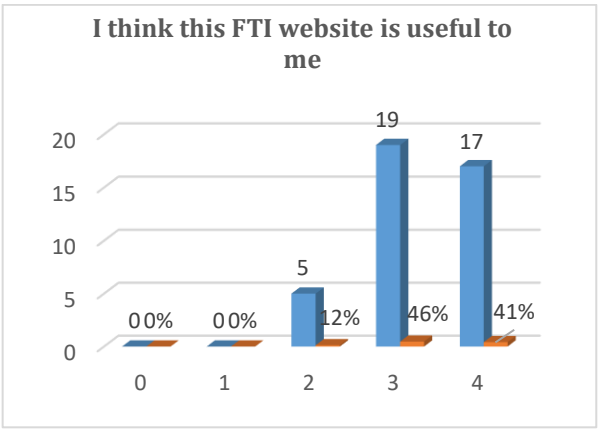

Figure 9. Results of Statement 5

Figure 9 shows that 46% agree and 41% strongly agree that the FTI website is helpful for respondents. This figure differs quite drastically from the two previous statements (statements 1 and 3), which agree and strongly agree at around 60%; statement 5 is in the 80s.

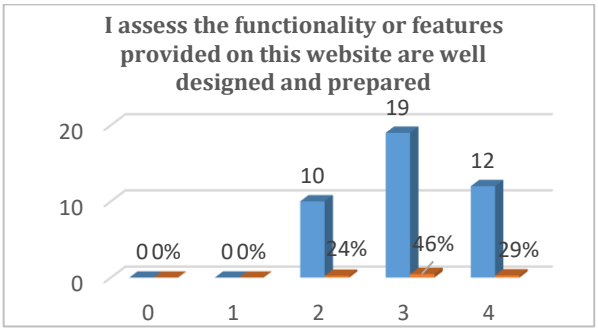

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Figure 10. Results of Statement 7

The results of statement 7 are shown in Figure 10. As many as 46% of respondents agree, and 29% strongly agree, that the functions or features on the FTI web are well-designed and prepared.

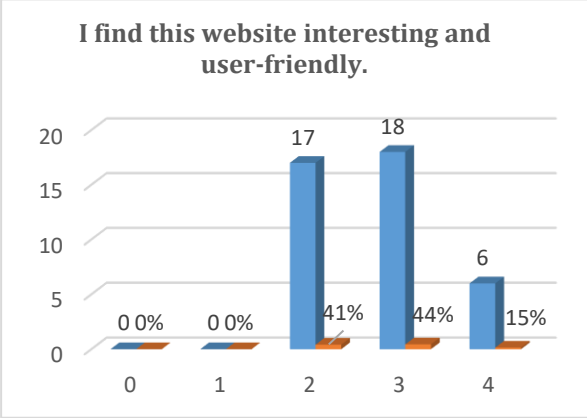

Figure 11. Results of Statement 9

Figure 11 shows the results of statement 9. As many as 44% of respondents agreed, and 15% strongly agreed, that the FTI web interface was attractive and user-friendly.

In contrast to odd statements, which indicate positive statements, even numbered statements indicate negative statements. This means that if the respondent gives an opinion that agrees or strongly agrees, this is a negative value or something that needs to be fixed from the FTI website. Even statements 2, 4, 6, 8, and 10 are shown in Figures 12, 13, 14, 15, and 16.

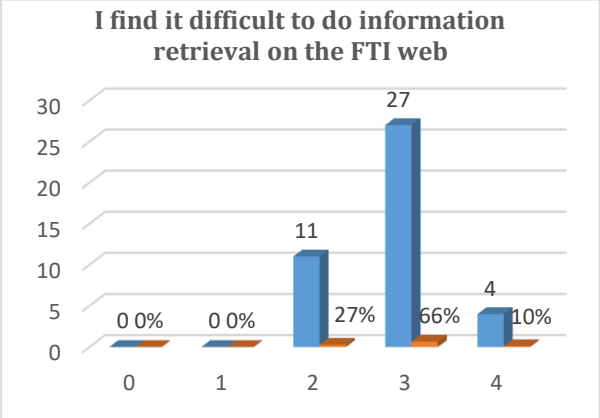

Figure 12. Results of Statement 2

The results of statement 2 are shown in Figure 12, which shows that 66% of respondents agree and 10% strongly agree that respondents find it challenging to search for the desired information on the FTI web.

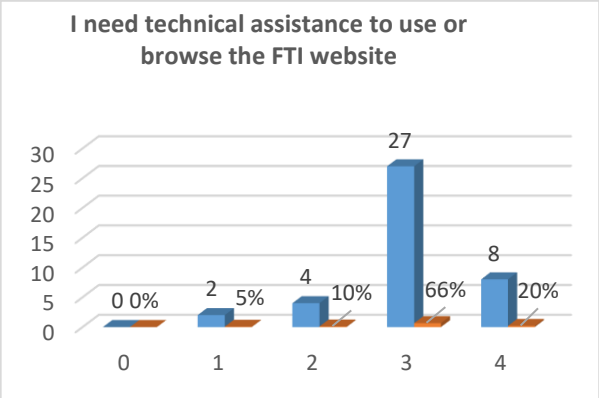

Figure 13. Results of Statement 4

Figure 13, the result of statement 4, shows that as many as 66% of respondents agree and 20% strongly agree that respondents need technical assistance to use or browse the FTI web.

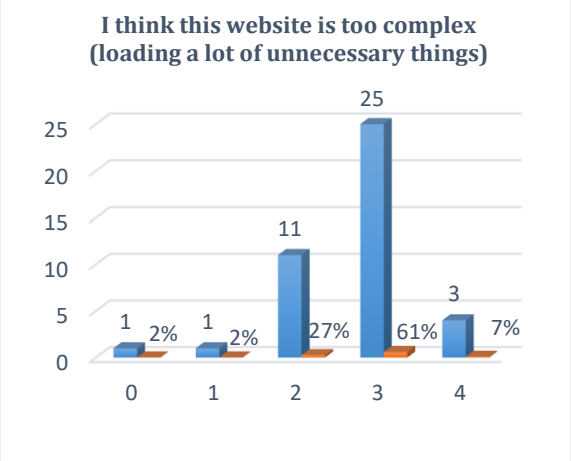

Figure 14. Results of Statement 6

Figure 14 shows the results of statement 6, where 61% agree and 7% strongly agree that the FTI web is too complex.

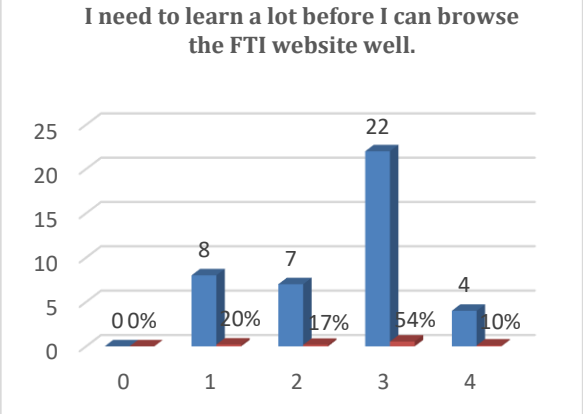

Figure 15. Results of Statement 8

The results of statement 8 are shown in Figure 15, with 54% of respondents agreeing and 10% strongly agreeing that respondents exploring this website must learn many things first.

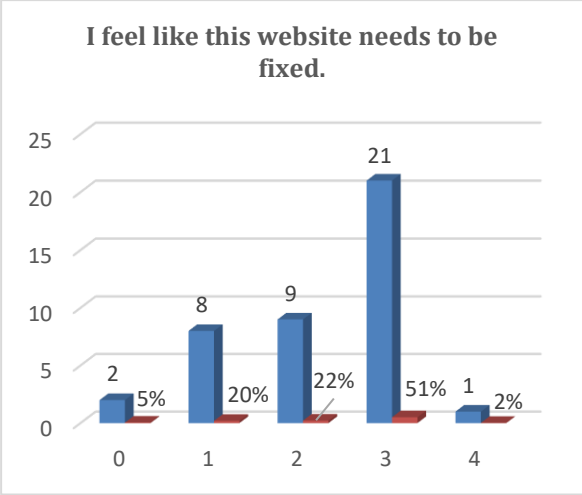

Figure 16. Results of Statement 10

Figure 16 shows the results of statement 10, where 51% of respondents agree and 2% strongly agree that the FTI website needs to be improved to make it even better.

Based on the ten statements in the SUS questionnaire, if sorted by statements with the most positive and most negative results are shown in Table 5 and Table 6.

Table 5. Statement Sequence with Most Positive Results

Sequence	Statement	A	B	Total
1	5	46%	41%	87%
2	7	46%	29%	75%
3	1	51%	17%	68%
4	3	59%	2%	61%
5	9	44%	15%	59%
6	10	20%	5%	25%
7	8	20%	0%	20%
8	4	5%	0%	5%
9	6	2%	2%	4%
10	2	0%	0%	0%

Information:
A = Agree (for negative statements), Disagree (for positive statements)
B = Strongly Agree (for negative statements), Strongly Disagree (for positive statements)

Table 6. Statement Sequence with Most Negative Results

Sequence	Statement	A	B	Total
1	4	66%	20%	86%
2	2	66%	10%	76%
3	6	61%	7%	68%
4	8	54%	10%	64%
5	10	51%	2%	53%
6	1	15%	0%	15%
7	3	5%	0%	5%
8	5	0%	0%	0%
9	7	0%	0%	0%
10	9	0%	0%	0%

Information:
A = Agree (for negative statements), Disagree (for positive statements)
B = Strongly Agree (for negative statements), Strongly Disagree (for positive statements)

When seen from Table 6, the order of the top five points that need special attention is that respondents need technical assistance to browse the website, have difficulty searching for information, the website is too complex, need to learn many things before browsing the website, and the web needs improvement. Based on the results of this study, the UII Faculty of Industrial Technology can decide which points are the priority for improvement.

CONCLUSIONS AND SUGGESTIONS

Conclusion

The results of the usability/usability evaluation on the FTI UII website using the System Usability Scale (SUS) questionnaire method obtained a score of 69.32. This figure is from the view of acceptability, adjective rating, grade scale, and Net Promoter Score (NPS). It is known that the FTI website for acceptability is in the MARGINAL HIGH range, the adjective rating is close to GOOD, the grade scale is in class C, and the NPS has the potential to be passive to website users. This result shows that the usability of the FTI website is still acceptable, but for the usability of the FTI website to be even better, periodic improvements are still needed.

Suggestion

To maintain quality and improve the website's usability to make it even better, the FTI website should make periodic improvements, significantly reducing or eliminating unnecessary parts of the content. In addition, it is necessary to carry out further similar research using different

methods such as; Usability Testing, Heuristic Evaluation, UEQ (User Experience Questionnaire), and others. Further research is also recommended using a more significant number of respondents to obtain primary data that is accurate, valid, and reliable.

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