Development*User Interface and Experience of Web-Based Psychological Tests (Case Study: Universal University)*

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Abstract

Developing a user interface and user experience for a web-based psychological test application at Universal University, especially the Uvers Career Center (UCC), is a technology that is needed to make the appearance of an application non-monotonous and dynamic. Previously, psychological test applications that had been developed by previous research did not meet the UCC's own standard requirements. The data source that will be used is qualitative data and uses a usability testing method with the aim of making it easier for users to carry out psychological tests with a display that is in accordance with what is required by the UCC. The final result of the research is designing the user interface and experience of the MindQuiz application which has a usability score of 83.11.

Keywords : *User Interface, User Experience, Figma, Usability Testing, Physcology Test*

1.   Introduction

Man is   Wrong makhlu social one   in the use of digital platforms in interacting with each other both outside the network and obtaining information both general and within the network. The main aim of this interaction is to obtain information, one of which is to fulfill their needs.

[1]In accessing information, progressCurrent technology, especially information technology, which we know as the internet. Internet,*interconnected networking* which means computer connections of various types that form a network system that covers the entire world (global computer network) via telecommunications lines such as telephone, radio link, satellite and others. The term INTERNET comes from the Latin inter, which means "between". The internet is a virtual world of computer networks (interconnections) formed from billions of computers in the world.[2]49-93-1- SM (1) The development of technology is either specific or specific according to individual needs, such as in the fields of industry, economics and business as well as other aspects. In this case, the appearance of digital media such as the web is an important thing to pay attention to, such as a display with a user interface that is not monotonous, attractive and dynamic, and also easy for users to use.

Research, [3] optimizing the appearance of a website by paying attention to psychological aspects can increase user interaction and engagement. By paying attention to elements such as color, layout and navigation that suit the characteristics of the target audience, it will be easier to increase the success of the website in attracting and maintain consumer interest.

Universal University, a private university in the Riau Islands Province, precisely in the city of Batam, which has various study programs and institutions such as *Uvers Career Center (UCC)*. UCC is a center for career development that provides psychological test methods such as vocational tests, interest and aptitude tests, and other tests. However, currently UCC is still using other companies' products to carry out these tests.

Psychological tests, objective measuring tools and carried out on behavioral samples. The diagnostic or predictive value of a psychological test depends on the degree to which the test is an indicator of a relatively broad and significant area of behavior. The purpose of this test is classification, description, interpretation, and prediction. Specifically in the field of education, psychological tests concern intelligence, interests and talents, learning difficulties, school readiness, and so on. Psychological test tools are not only used for classification of psychological disorders or diagnosis, but are more focused on description or deeper understanding of participants.[4]

Previous research, UCC already has website which provides psychological tests based on expert system methods and theories published by Indra Kurniawan in 2021 with the title "Online Psychological Test Application Based on*Website* at Universal University". The research has a type of left-right brain test, cognitive tendency method, test who *am i* with the

scale test method liket with the results of the optimism scale, learning style test with method index *of learning styles* (ILS), and career choice test multiple choice test method. However, the appearance website This does not meet the needs user *interface* from the UCC so it has not been implemented in the UCC. Despite this, college and university students can still take psychological tests at UCC.

The obstacle experienced by UCC regarding this matter is that the need for this matter has not been met user *interface* which is interesting and not monotonous. The UI/UX display still uses a lot of text and there is no combination of text and images and attractive color combinations.

User interface which is well designed or designed on a website, makes visitors or users want to linger on the website[5]. In contrast, design user *interface* bad ones or not make visitors quickly leave the website.

Development*UI/UX*This psychological test was designed using the integration of ideas and technology through figma, towards making*UI/UX*-it's more beautiful, with figma using display vector and easy to use. The method in this research uses usability *testing. usability testing* there are several levels:*empathize, define, ideate, prototype,* and*test. Test usability testing* Data collection will be taken with 25-50 samples using a questionnaire. There are several studies that discuss psychological tests online one of which has been carried out is (Awaliah, and Graduates 2020). Because the tests published by Indra Kurniawan did not meet the needs (in terms of appearance), the author tried to develop the appearance*user interface dan experience* hand. psychology. The author calls the development "**DEVELOPMENT USER INTERFACE AND EXPERIENCE BASED PSYCHOLOGICAL TESTS *WEBSITE* (Universal University Case Study)".** This psychological test application will be used by Vocational High School, High School and prospective students

2. Library Review
2.1 *User Interface (UI)*

User interface,[7] the interface of a computer and software that is displayed to the user to facilitate pleasant interactions between the system [8] and the user, in another sense user *interface* can be interpreted as a space where interaction between humans and machines takes place. [9]So*user interface* is important because it relates to users.

Appearance*user interface* It has basic components viz*colors* (base color in*design*), *layout* (placement/layout),*typography* (use of letters),*illustrate* (images/icons) with this aspect can beautify the appearance of the application.

Design*user interface* it varies greatly, it depends on factors such as the purpose of the interface, user characteristics, and device characteristics interface of a specific nature. For example, although all user interfaces should be designed for maximum ease of use with considerations such as efficiency for the particular hardware (e.g.*keyboard, mouse*, and a large high resolution screen). A goal user *interface* This is communicating the available system features so that users understand and can use the system. In this case, the use of language is very effective in

helping understanding, because language is the second oldest communication tool, gestures, which people use to communicate every day.[10]

2.2 User Experience

User Experience [11] a person's perception or experience and response to the use of a product, service, or system. Besides that*UX* [12] is also not the way a product or service works, but is an outside way of working, where someone comes and meets directly.

User Experience not only focus on how an application works inside but how an application can work outside the application (how users can interact with the application.

A term website usually not fixed and not arranged to determine the shape of a website but usually contains text and other visual media. Building principles*UX* is that the audience has the power to determine their own level of satisfaction*(costumer rule)*. The digital world is increasingly developing, so is t mobile so make*UX* becomes more consistent because when accessing the web using different devices such as via*desktop* with smartphone it will show*view* different. A Website, *user experience* is about user interaction or experience of something.

products with web pages. Websites, consisting of and the relationship between elements in an HTML composition that has the best technology for design. This principle can be found in the image below supporting content with these users and features/functions:

influential, however user experience will be much more effective for users. When a site has a good experience and other companies' products have a better experience, then users will return to other companies that are better [13].

2.3 Usability Testing

Usability, the extent to which users can use a product to achieve certain goals with effectiveness, efficiency and satisfaction in the context of its use.[8]. Apart from that, it also refers to a method to increase ease of use during the design process.

Usability Testing, user involvement in collecting empirical data and evaluating the quality of user experience*(user experience)*when using the product.[14] Development of science human- *computer interaction* which focuses on interface design and product interaction with humans. So, study usability *testing* learn and use technology, applications or websites. Indicators on usability It is also used to measure how satisfied users are in using the technology, application or product to achieve their goals or objectives. Measurement criteria*Usability Testing:*[15]

a. ***Learnability,*** measure the level of ease of performing simple tasks when first encountering a design.
b. ***Efficiency*** measure the speed of performing a particular task after studying the design.
c. ***Memorability*** see how quickly users regain proficiency in using the design when they return after some time.
d. ***Errors*** see how many mistakes users made, how serious the mistakes were, and how easily they found resolution.

e.   **Satisfaction** measure the level of satisfaction in using the design.

From the identification of the five test components (*usability testing*), to calculate the test, you can use the following formula:

$$\overline{X} = \frac{\sum X}{n}$$

Figure 1. Calculation*Usability Testing*

2.4 Design Principles

Design principles, guidelines or rules arrange design elements and attributes so that they look beautiful and functional.[16] There is a general design principle: Figure 2. Union (*Unity*)

1.   Unity(Unity) Namely a design principle that prioritizes harmony
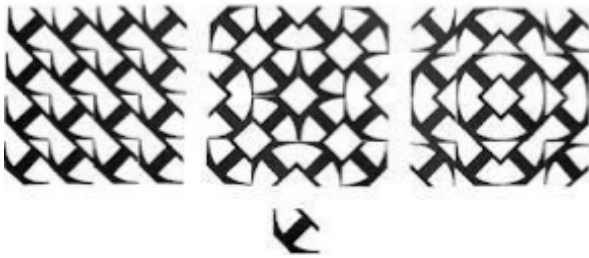
Figure 2. Union (*Unity*)

2.   Balance (*Balance*), Balance is a composition that leads to visual distribution because the visual weight must be balanced on both sides of the center line, as in the image below:
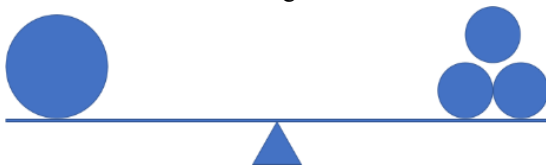
Figure 3. Balance

3.   Proportion (*proportion)*, It is a comparison of measurements used to help compare length and width, or between an image and its surface, this is also a basic principle for achieving harmony, as in the image below:
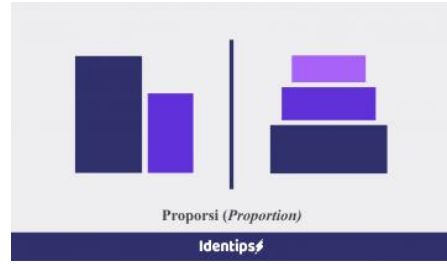

Figure 4. Proportion

4.   Melody*(Rhythm),* Rhythm, the repetition of lines, shapes, forms or colors in an orderly or harmonious manner. On the principle of rhythm, when looking at a design, the eyes move rhythmically from one object to another.[17] More details can be seen in the image below:

Picture 5. Rhythm

5.   Contrast (*Contrast*), Namely the principle of distinguishing elements in a composition in color, size, shape, texture, and others. This can be seen in the picture:

Figure 6. Contrast

6.   Harmony, Functions as a factor so that a design is not too overwhelming, inversely proportional to the nature of contrast, or can also be interpreted as showing unity in the selection, use or arrangement of objects and ideas.
7.   Emphasis (Emphasis) Something that is the focus or the first thing to pay attention to.

2.5 Figma

Figma, a design tool that can be used anytime and anywhere as long as it is connected to the internet. Figma is shaped website which is connected with cloud. This tool is based vector and equipped with features prototyping which makes it easier for users to design user interfaces[18]. Figma was created with the aim of helping its users to collaborate on projects and work in teams anywhere. [19] For the symbols as shown below:

Figure 7. Figma

Figma has an edge in creating frame layout as the start of the design process for a layout that supports faster evaluation (*auto layout*).
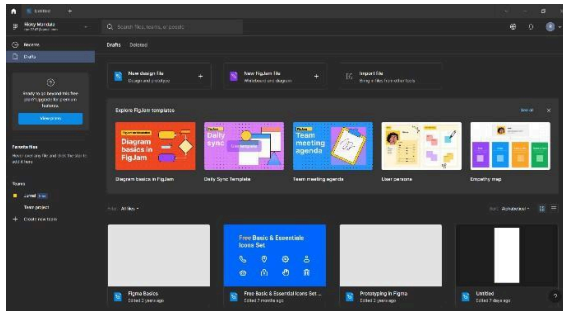

Figure 8. Figma application

One of Figmas features is the design features responsive, making it easier to design a design that can adapt to device used. device used. This feature is very suitable for designing the user interface (UI) of applications or website. This design feature has several attributes that Figma consists of, namely:

1. *Pen tool modern*

    Pen tool, a tool used to create various types of curves in manufacturing vector workspace which is being made.*Tool* used to create dots path which will form a shape.

2. *Open type* is a feature font to customize font.
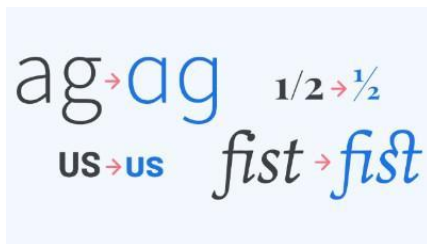
Figure 10.*Open Type*

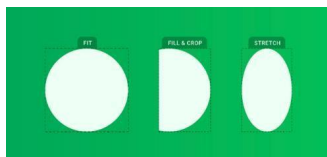3. *Stretch to fill*, is a customization to create objects with*set to fill center, fit, stretch.*

Figure 11.*Stretch to fill*

3. **Research methodology**

    The method used in this research is
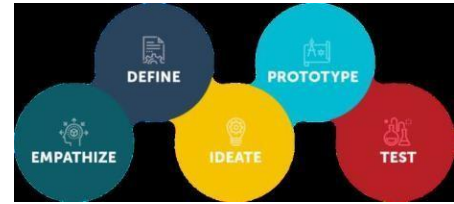
method *Design Thinking.*

Figure 12. Research method
Source: [20]

1. *Empathize*

    In the first stage, researchers will first understand the needs and desires of students and UCC students by conducting interviews and identifying problems and obstacles experienced by users in previous psychological test applications, and analyzing user preferences and expectations and user experience.

No	Interview Criteria
1	What is UCC and its scope
2	Psychological testing at UCC and its benefits for students and prospective students at Uvers
3	Application hand psychology Which used previously
4	Whether or not the addition of the type of test is important
5	The importance of development user *interface* and user *experience* on the web display the psychological test

Table 1. List of Interviews

No	Interview Criteria
1	What is UUC and what is its scope?
2	What are the benefits of psychologist testing for students and prospective students at Uvers?
3	What is the phycology test procedure at Uvers?
4	Has there previously been a psychological test application at UCC?
5	Is there a need for additional types of psychological tests at UCC?
6	Apart from the type of psychological test, what is the appearance?*user interface* and user *experience*-her need to be developed according to UCC requirements?
7	What are the shortcomings of previous psychological test application features?

Table 2. Contains interview questions asked to respondents.

2. *Define*

    In the second stage, researchers will detail the

problems faced by searching objective from problems, formulate development user *interface* and experience psychological test applications, and determine the features desired by users. Problem identification is carried out by observing the results of interviews that have been conducted to find out complaints from users and what the desired solution is.

3. *Ideate*

In the third stage, researchers collect new ideas to improve the UI/UX appearance through define and use techniques brainstorming to consider psychological aspects, such as color,*layout*, *wireframe*, and navigation.

4. *Prototype*

In the fourth stage, researchers will build a prototype with the figma application based on the ideas generated and meeting user needs and expectations from test results and user feedback.

5. *Test*

The final stage, researchers will carry out test there is display design, and testing with usability *testing* to identify applications that have been created. Through stages usability *testing,* These stages will create questions about testing and usability *testing* through a questionnaire that will include learnability*, efficiency, memorability, error dan satisfaction.*

The measurement procedures in this research will be measured usability *testing scale*. In the research, the level of assessment will be made using a scale likert.

Indicator	Mark
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly agree	5

Table 3. Assessment indicators

This questionnaire will be distributed via google *form.* Data collection will be taken with 25-50 samples from people who are application testers*MindQuiz.*

4. Results and Treatment

4.1 Prototype – *Mockup as Admin*

a. *Admin*

● Home

This menu home will display headline will display the top right main view hashomer, psychological tests, job application information, andlogin, and in the middle there is the slogan "Start getting to know yourself. Try it for free to find out yourself." At the beginning of the page at the bottom right there isLink API whatsapp, as in picture 13:
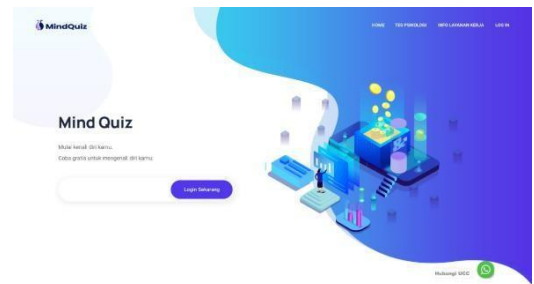

Figure 13. Menu displayHeadline

● Login

Appearances Login, to enter the system. The use of the system is required to carry outlogin by doing input email and password, as in the picture:
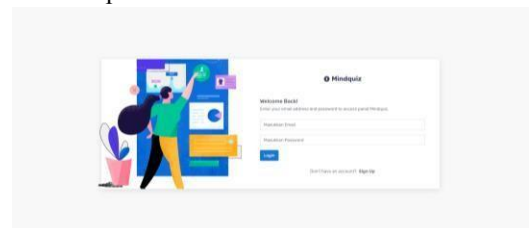

Figure 14. Display*Login*

● Dashboard Admin

Dashboard admin contains user numbers, data*score* There are users who have completed the test score learning style,*score* left brain and right brain,*score* career choice,*score who am i*, which can be edited and deleted by admin, as in the picture:
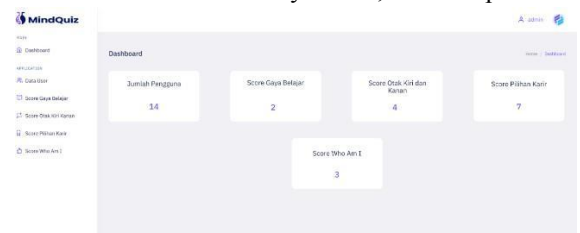

Figure 15. Menu display*Dashboard* Admin

● Data *User*

Fill in the data display user has table data such as name, NIM,*role*, email, date the account was created, and edits containing icon edit, as in the picture:
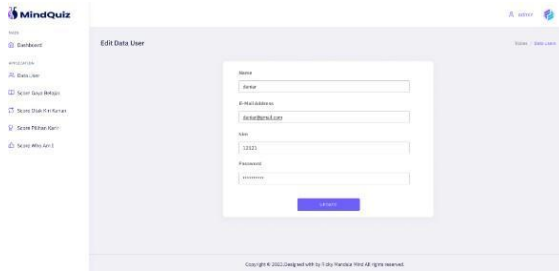

Figure 16. User Data Display
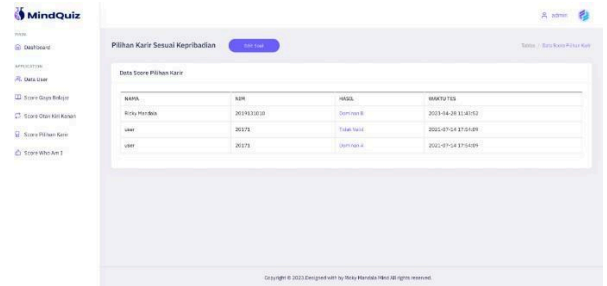
Figure 17. Edit User Data Display

● Learning Style Menu

Contains a data table *score* learning style, *button* edit the question and have a tab *user*.

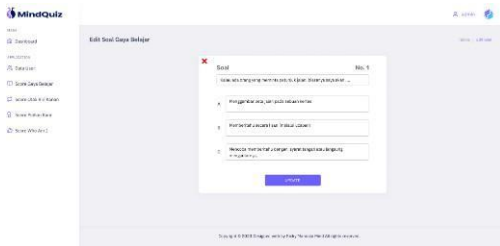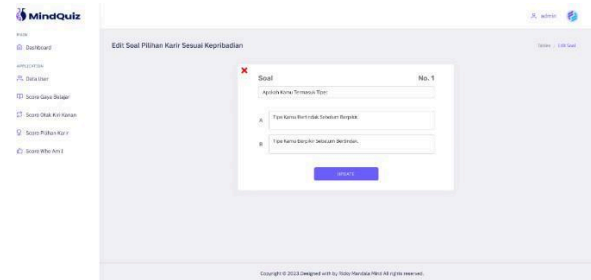Figure 18. Admin Learning Style Question Editing View

● Left and Right Brain Menu

Contains left and right brain data menus and tables displaying user test results and question editing menu

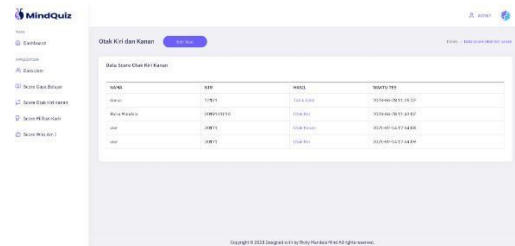.The display can be seen in figure 4.43.

Figure 19. Data display *Score* Left and Right Brain

Figure 20. Admin left and right brain question editing display

● Career Options Data Menu

Contains data on career choices according to personality, has a test results table and edits questions. The display can be seen in the picture

Figure 21. Data Display *Score* Career Options

Figure 22. Edit screen for career choice questions

• Menu Data *"Who am I"*

Contains "who am I" test score data and edited questions. The display can be seen in the image.

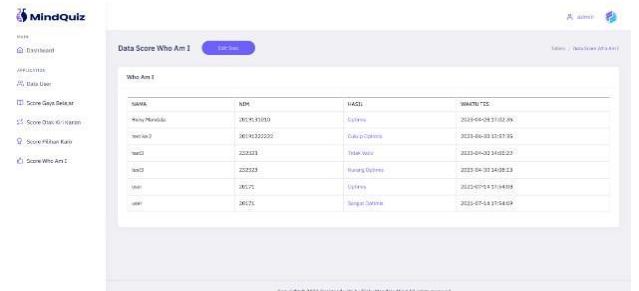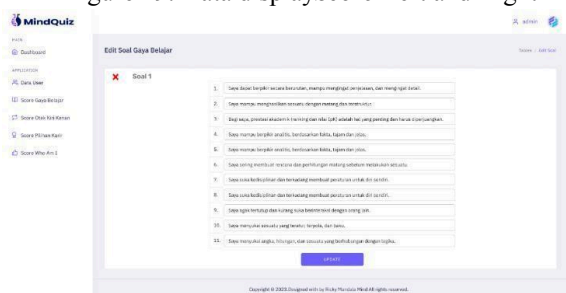Figure 23. Data Display Score Who am i Admin
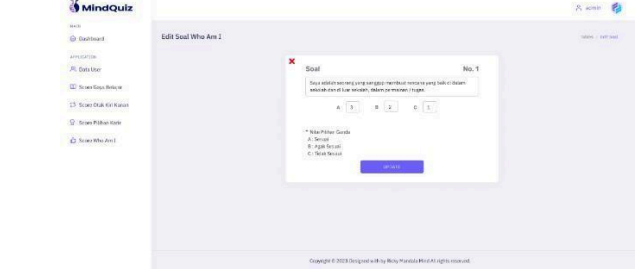

Figure 24. Test Question Editing Display Who am i Admin

b. User

• *Dashboard User*

Dashboard user own sidebar menu, 1 menu dropdowns *, and start test Of Dashboard*, on the left sidebar to see *score* who has completed the test and learning styles, left-right brain, career choices, *who am i for start* the test. The display can be seen in the picture:
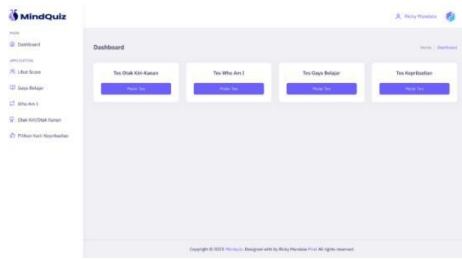
Figure 25. Display*Dashboard* User

• View Score

The contents of the view view*score* user, test results from learning style tests, left-right brain, career choices,*who am i,* can be opened and see the results. The display can be seen in the picture:
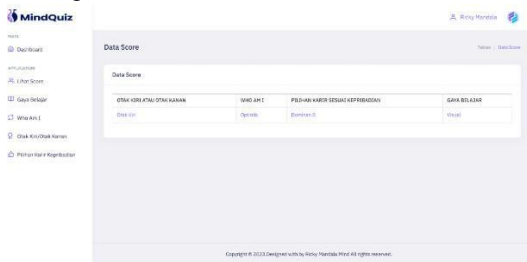

Figure 26.View View*Score* User

• Learning Style Test

Display for taking learning style tests. The form of the test is objective with 15 questions, 1 screen with 1 question and multiple choice A, B, and C. If you have chosen, you will auto *next* and below is the navigation next and back. The display is seen in the picture.
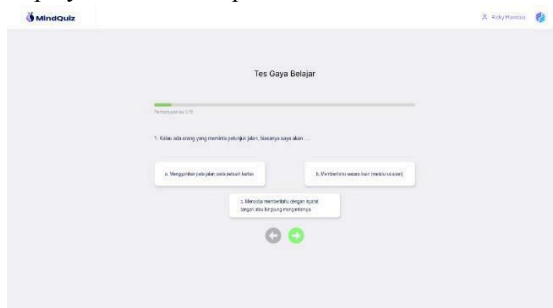

Figure 27. View of Taking the Learning Style Test

At the end of the test there is a button*submit* and will display the results of the tests that have been carried out. Views seen in the picture:
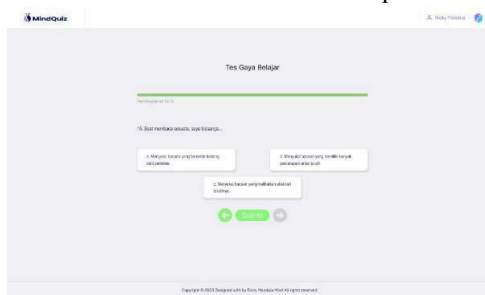

Figure 28. View of taking the Learning Style Test

• Hands*"who am i"*

The test is multiple choice with 15 questions with multiple choice displays suitable, somewhat suitable, and not suitable. The display can be seen in the picture. At the end of the page there is a button*submit* a test that must be pressed after completing the test and immediately displays the results of the test. The display can be seen in the picture:
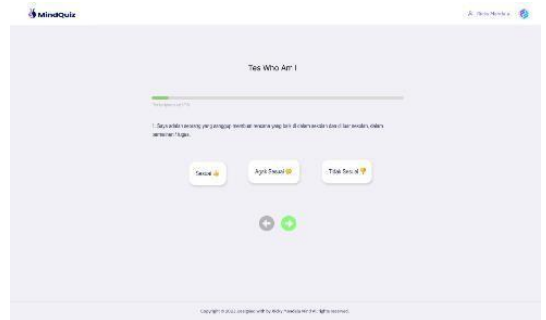
Figure 29. Display of Taking a Test "*who am i*"
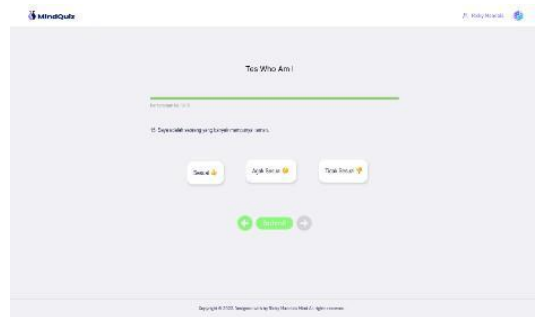
Figure 30. Display of taking a test*Who am i*

• Left and Right Brain Test

Left brain and right brain tests, check in nature checkbox available, in question 1 there are 11 question, and in question 2 there are also 11 questions, in the middle there is a notification "choose according to your personality!" and below are next and back to return to question 1 or question 2. The display can be seen in the picture:

Figure 31. View of taking the left brain/brain test

- Career Choice Test

The form of the test is questions and multiple choice with 2 choices, and below are:*next* and*back* to return to

question 1 or question 2. The display can be seen in the picture:

Figure 32. View of taking the Personality Career Choice Test

Display learning style test results,*who am i*, left brain and right brain, and personality career choices as in figure 33, will have different results from the display of learning style test results, who am i, left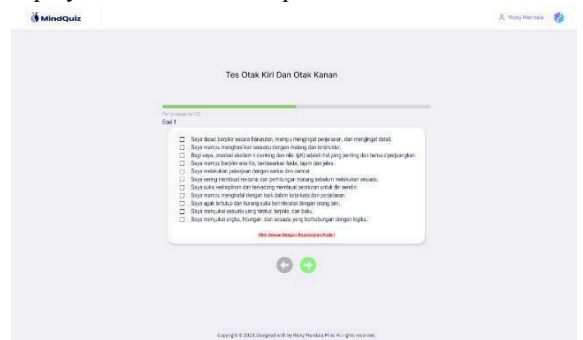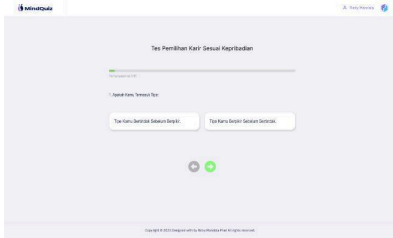 brain and right brain, and personality career choices as in figure 33, will have different results from the psychological tests carried out. and the display is the same as the admin to see the user test results.

Figure 33. Display of user and admin test results

4.2 Test

Test carried out through pictures and tables and explanations to obtain results test with the samples that have been obtained. How to determine satisfactory results, researchers will do the following:

1. Provides questions about experiences using psychological tests online
2. Provide assistance to participants in conducting trials
3. Collect data using questionnaires usability *scale.*

a. User Testing

Of the 50 samples taken, 32% had no experience in psychological tests, and 64% had little experience in using psychological tests on average and only 4% had sufficient experience in using psychological tests on average.
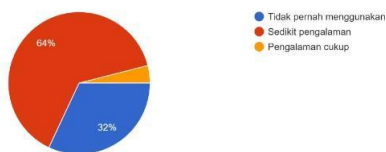

Figure 34. Psychological Test Experience from 50 Samples

Age data*testing* 24% less than 18 years 12 people, 66% 18-24 years 33 people, 6% 25-34 years 3 people, 2% 35-44 years 1 person, and 2% 45 years and over 1 person.
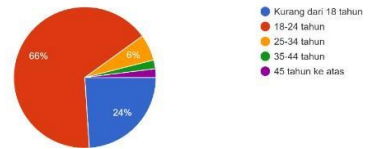
Figure 35. Average Age of 50 Samples

b. Questionnaire*Usability Scale*

The results of this questionnaire contained 50 samples to measure with 5 variable criteria learnability are as follow

Pertanyaan	STS	TS	N	ST	SS	Total
Aplikasi MindQuiz Sudah Memenuhi Tampilan Visual (UI)?	2	1	8	26	13	50
Navigasi / Pandu Arah Yang Mudah Dipahami Pada Tampilan?	2	0	5	27	16	50
Tampilan *Web site* Mudah Digunakan	1	0	3	30	16	50
Tampilan Menu-menu Dalam Desain Mudah Dimengerti	1	0	7	21	21	50
Tampilan Sudah *User* Friendly?	1	1	4	26	18	50
Total	7	2	27	130	84	250
$\bar{x}$	(7+4+81+520+420) x 0.08 = 82.56					

Tabel 4.1. Variabel Learnability

The results of this questionnaire contained 50 samples to measure with 5 variable criteria efficiency are as follow

Question	STS	TS	N	ST	SS	All at
The Mindquiz application reduces paper usage	1	0	5	15	29	50
Makes it easier to test online without psychological tests	1	1	8	21	19	50
Total	2	1	13	36	48	100
$\bar{x}$	(2+2+39+144+240) x 0.2 = 85.4					

Tabel 4.2 Variabel Efficiency

The results of this questionnaire contained 50 samples to measure with 5 variable criteria memorability are as folloW

Question	STST S	TS	N	ST	SS	Total
The color combination is appropriate	1	2	10	21	16	50
I Remember Easily*Layout* From the Mindquiz Application	1	2	13	21	13	50
Total	2	4	23	42	29	100
$\bar{x}$	(2+8+69+168+145) x 0.2 = 78.4					

Tabel 5. Variabel Memorability

The results of this questionnaire contained 50 samples to measure with 5 variable criteria error are as follows:

Question	STST S	TS	N	ST	SS	Total
Appearance*Error* The following is easy to see And Understood	1	1	5	22	21	50
There is a message that Be Clear On Message *Error*	1	1	5	22	21	50
Total	2	2	10	44	42	100
$\bar{x}$	(2+4+30+176+210) x 0.2 = 84.4					

Table 6. Error variables

Question	STST S	TS	N	ST	SS	Total
I don't need a long time to operate Application	1	2	9	16	22	50
How to Test Features Is what is shown good?	1	0	7	13	29	50
Total	2	2	16	29	51	100
$\bar{x}$	(2+4+47+116+255) x 0.2 = 84.8					

5 Conclusions and recommendations
5.1 Conclusion
Based on the results of the research and discussions that have been carried out, the author can conclude that:
1. .The results of measuring the usability of the

By determining the interval class assessment, the following table can be seen:

Quadrant	Interval	Assessment criteria
IN	83-100	Very good
IV	65-82	Good
III	47-64	Pretty good
II	30-46	Less
I	13-29	Very less

Table 8. Assessment Criteria Interval

From the results of calculating the average of the variables usability The values obtained to determine the assessment results are as follows:

Variable	Rate-rate	Assessment criteria
Learnability	82.56	Good
Efficiency	85.4	Very good
Memorability	78.4	Good
Error	84.4	Very good
Satisfaction	84.8	Very good
Mean	83.11	Very good

Table 9. Evaluation Criteria Interval

MindQuiz application are based on the learnability variable with a sample size of 50 people with an average value of 82.56, which means good criteria.
2. 2. The results of measuring the usability of the MindQuiz application are based on the efficiency variable with a sample size of 50 people with an average value of 85.4, which means the criteria are very good.
3. The results of measuring the usability of the MindQuiz application are based on the memorability variable with a sample size of 50 people with an average value of 78.4 which means good criteria.
4. The results of measuring the usability of the MindQuiz application are based on the error variable with a sample size of 50 people with an average value of 84.4, which means the criteria are very good.
5. .Results of measuring the usability of the MindQuiz application based on the variable satisfaction with the number The sample was 50 people with an average score of 84.8, which means the criteria are very good.

6. From the overall results, the overall average calculation for all variable results produces a value of 83.11, which states that the user interface and experience are very good.

5.2 Suggestion

Suggestions that can be given by the author regarding the limitations of the system being built are:

1. Create a view*user interface* and experience become an application website *online*.

Designing application MindQuiz platform *mobile*/android and more responsive

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