Design of User Interface and User Experience Website-Based Mental Health Applications as a Means of Counseling Universitas Negeri Semarang Students Using Design Thinking Methods and System Usability Scale

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ABSTRACT
User Interface (UI) and User Experience (UX) are important components for designing a new application. Website-based online counseling applications are useful for students to conduct online counseling. With the counseling application, students can access counseling without the need to meet directly with a psychologist. To design a counseling application, the right method is needed, namely using design thinking. In addition, the test method used is the System Usability Scale (SUS). Research sampling in the emphatize stage using purposive sampling techniques with predetermined respondent characteristics, 3 people were interviewed participants. From the results of the interview, a user persona and pain point will be created. Furthermore, at the define stage, the most urgent and significant pain points are identified. At the idea stage, brainstorming ideas that will be used as solutions to problems is carried out. The idea will be implemented into a wireframe. The wireframe that has been created will be developed into a high fidelity design. At the testing stage, sampling uses the random sampling method. The number of respondents to conduct testing was 43 people. The results of the counseling application testing get an SUS score of 75. Interpretation SUS scores occupy grade C in the Good category (good) and get an acceptable predicate in the acceptability range category.

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1. INTRODUCTION

Mental health is an important aspect of a person's life which is influenced by various other aspects of well-being, such as productivity, quality of life, and interpersonal relationships. In research (Tabor et al., 2021), mental health generally improved in the 17 to 24 year age group. Mental health among students is considered a serious problem and is a big concern for universities and society (Schislyaeva & Saychenko, 2023). During college, students struggle to adjust to new routines, face academic pressure, and fear of failure (Lattie et al., 2019). In addition, various phenomena on campus, such as bullying, violence, and suicide, cause harm to families, students, and universities which can lead to an increase in mental health problems (Schislyaeva & Saychenko, 2023).

The emergence of mental health problems among students requires the provision of student mental health support services (Levin et al., 2020). Various mental health support services have developed, one of which is counseling services and online mental health programs that have been proven to reduce mental health problems (Weiner et al., 2020). The main advantage of online services is that they do not have time and space limitations (Kim & Lee, 2023). In empirical research conducted (Memmott et al., 2021), there are factors that are the main drivers of user engagement with counseling service applications, namely user interface and user experience.

User Interface (UI) a means used by users to interact with computers or other electronic devices (Oulasvirta et al., 2020). User interfaces are used as visual, auditory, and textual for users of a system (Joshi et al., 2023). The purpose of the user interface is to improve usability and user experience. Therefore, the smallest elements in user interface design and visualization have a significant impact on the user system as a whole (Joshi et al., 2023). Thus, the user interface should make a good impression when the user first views the web page. One way to create a beautiful user interface is by giving an attractive impression to the appearance of the system (Fitriana et al., 2022). In addition to an attractive appearance, a good experience is also needed when interacting with the system. User experience is the overall experience that users experience when interacting with the system. User experience can be used in design and development to make the system user-friendly, efficient, and fun to use (Berni & Borgianni, 2021). User experience is an important factor in the success of a system, because it focuses on user needs (Henim & Sari, 2020). User interface and user experience design focuses on user needs, so the right design approach is needed.

Design approaches such as design thinking are becoming increasingly important, especially in application design. According to Parizi et al (2022), design thinking places user needs as the main focus, provides a solid foundation for

interacting more deeply with users, evaluating user behavior, and producing solutions that focus on meeting user needs. In addition to focusing user needs, Darmawan & Rohman (2022) make it clear that design thinking also combines aspects of creativity and innovation in the design process. The result of application design is not only a visual representation of the solution, but also a tool to directly test user response. Maricar et al (2021) emphasized the importance of conducting a usability testing analysis. Usability ensures that the developed system meets the needs of users conceptually and provides a satisfactory user experience in its use.

One method that has proven effective in evaluating the extent to which applications can meet expectations is to use System Usability Scale (SUS) (Hyzy et al., 2022). SUS is a standardized questionnaire that summarizes structured questions, providing a solid foundation for assessing the level of usability perceived by users. The concept of usability itself, as explained by Brooke (2020) involves how effective, efficient, and satisfying users are in achieving the goals of using the system. Research conducted by Ependi et al (2019) has shown that the use of SUS as a testing technique provides an advantage in getting faster feedback because this test scale can be easily understood by users. In addition, testing using SUS involves users directly and can be done with a small number of samples.

In this research, the design of a website-based mental health application user interface and user experience will be carried out as a means of counseling UNNES students which aims to produce products in the form of mental health applications that meet user needs and preferences. By developing a website-based mental health application, this research can provide easier and more effective access for students to get counseling and mental support. The approach used by applying design thinking and evaluation methods using SUS, not only aims to develop technology, but also pay attention to the needs of users as a whole. The research location is located at UNNES. The sample in this study was college students who had mental health problems. This research begins with an empathy phase which aims to identify user needs in dealing with mental health problems. In this phase, interviews will be conducted with three resource persons, namely students from psychology study programs, Wellbeing institutions, and students who have experience related to mental health problems. The interview results will be analyzed and used as material to design the user interface and user experience of mental health applications. Then testing will be carried out using SUS to measure and evaluate the level of usability and user satisfaction with the results of the user interface design and user experience of the counseling application.

2. RESEARCH FRAMEWORK

This study used a mixed method, which combines qualitative and quantitative approaches in the design of mental health applications. In a qualitative approach, the design thinking method is used by involving interviews and observations to understand more deeply the needs, preferences, and problems faced by UNNES students related to mental health. From a quantitative perspective, this study utilizes the SUS method to measure the level of usability or ease of use of mental health applications. By collecting data through the SUS questionnaire, this study was able to produce objective data to measure the extent to which this application met the expected usability standards. This quantitative approach provides a strong evaluation framework for assessing application success. This study applies the research design that can be found in the illustration in Figure 1.

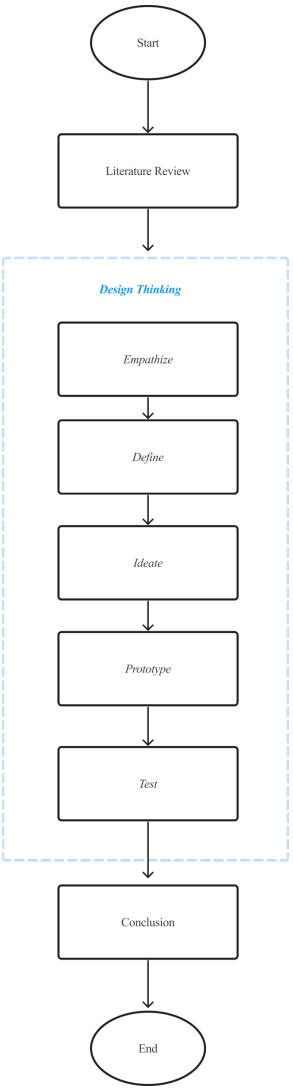

Figure 1. Research Design

3. RESEARCH METHODS

3.1 Emphatize

Empathize is the first stage to deeply understand the needs and perspectives of users. This stage involves interviews, observations, and data collection to explore the needs, preferences, and problems faced by users (Pande & Bharathi, 2020). In this study, the empathize stage was carried out with in-depth interviews with three resource persons based on predetermined criteria. In addition, the creation of user personas as a fictitious representation of the ideal user who will use the design of the application. User persona aims to visualize who the main user is, what needs, preferences, and problems they have.

3.2 Define

In the define stage is to identify problems that have been found in the previous stage. This step involves mapping and a deeper understanding of the problems faced by users (Pande & Bharathi, 2020). In this study, data analysis was carried out from the interview stage. Emphasis is given to the most urgent and significant problem or pain point that will be made as the formulation of the problem statement. The formulation of a problem statement or so-called Point of View (PoV) must be clear, concrete, and user-focused. This process considers the user's needs and allows for a deep understanding of the user's perspective. The result of this problem formulation will be a "How Might We" (HMW) statement as a way to ask questions about how solutions or improvements can be applied to address the identified problems.

3.3 Ideate

At the ideate stage, brainstorming sessions are carried out with the aim of generating a large number of ideas to solve the identified problem. The goal is to create solutions and innovations to overcome the challenges faced (Ramadhan & Fitriana, 2022). These ideas will be prioritized ideas based on the priority scale. A priority scale is a method used to identify and classify ideas that have the greatest potential to solve a problem or improve a product. The results of ideas that have been prioritized will be realized through the creation of flowcharts. A flowchart is a visual representation of the flow or sequence of steps in a system. Flowcharts are used to graphically illustrate how a system works, by showing the sequence of steps taken as well as the relationship between the steps. After the flowchart creation process, the next step is to create a design with a low fidelity level, known as a wireframe. A wireframe is a simple visual representation of a user interface without in-depth design details.

3.4 Prototype

The prototype stage is carried out after determining the idea to be implemented in the design. The purpose of this stage is to produce a visual representation that can be tested and evaluated by users (Ramadhan & Fitriana, 2022). A visual representation that includes key features and functionality desired by the user. The prototype stage in this research begins with the creation of an Entity Relationship Diagram (ERD). ERD is conceptual database modeling with an arrangement of data stored in the system in the abstract using notation and symbols. Then a Unified Modeling Language (UML) will be created. UML is a method used to model, document, and design a system. The next prototype stage is creating a design system. A design system is a structured approach to creating consistency and uniformity in the appearance and interaction of the user interface on a product or platform. After creating a design system, the next step is to implement the wireframe into the user interface design in the form of an application. The result of this design is the final appearance of the product.

3.5 Test

At the test stage, users will evaluate the application to measure the extent to which the product approaches the user's expectations (Pande & Bharathi, 2020). This research uses the SUS method to measure the level of usability and ease of use of mental health applications. In this research, testing will be carried out by distributing the SUS questionnaire containing ten questions via Google Form. The data results from this questionnaire will be calculated using the SUS formula and interpreted using the SUS scale. SUS value analysis will reflect the level of user satisfaction and engagement.

4. RESULTS AND DISCUSSION

4.1 Emphatize Result

In the empathize stage, data is collected about mental health problems among students. This process involves in-depth interviews with three pre-selected samples. The goal is to gain a more detailed understanding of the problem.

4.1.1 *Respondent Characteristics*

The selection criteria for respondents used a purposive sampling technique, namely selecting samples from individuals who have special expertise or knowledge in a particular field, such as experts or experts with relevant competencies and experience. The aim is to ensure comprehensive representation of the various viewpoints relevant in the design of mental health applications. These three samples have their respective roles to help research. These roles are as follows:

1. Psychology students play a role in providing a perspective based on science.

2. The Wellbeing Institute plays a role in representing the perspective of service providers.
3. College students with mental health issues are the real end users of the app.

4.1.2 *User Persona*

Creating a user persona as a fictional representation of the ideal user who will use the online counseling application. The following is the user persona of a mental health application as a means of counseling in Figure 2.

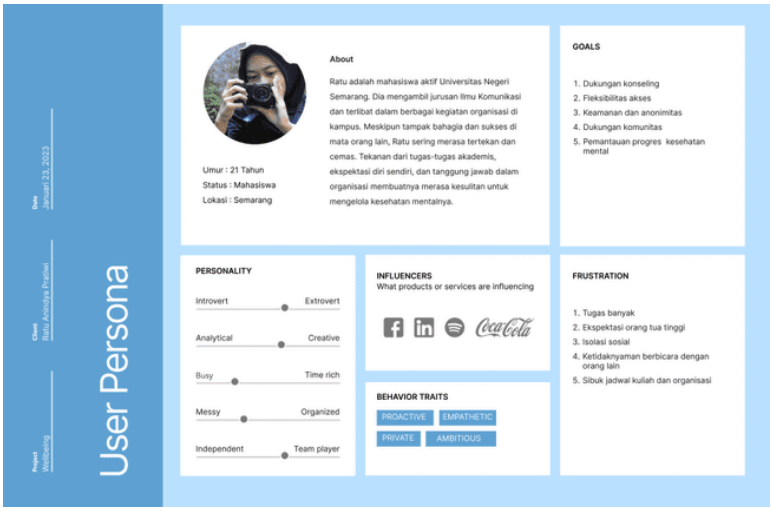

Figure 2. User Persona

4.2 Define Result

At the define stage, data analysis of user persona is carried out. The results of this analysis will be used as pain point and how might we provide solutions to overcome these problems.

4.2.1 *Pain Points*

The following are the pain points obtained in Figure 3.

Figure 3. Pain Points

4.2.2 *How Might We*

The results of how might we obtained are shown in Figure 4.

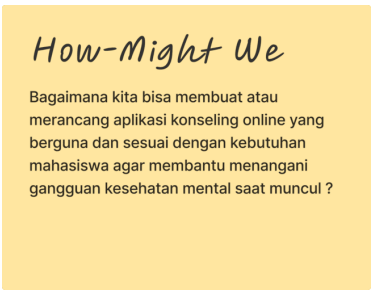

Figure 4. How Might we

4.3 Ideate result

The ideate stage focuses on looking for ideas as the basis for the main considerations. These ideas are considered innovative solutions to overcome the problems that have been identified. During the ideate stage, intense efforts are made to develop ideas with various concepts that are creative and suit user needs. The processes carried out at the ideate stage are brainstorming, prioritization of ideas, making flowchart and wireframe.

4.3.1 *Solution Idea*

The following are the results of the brainstorming that has been carried out in Figure 5.

Figure 5. Solution Idea

4.3.2 *Prioritization Idea*

The following is the idea prioritization process using the priority scale in Figure 6.

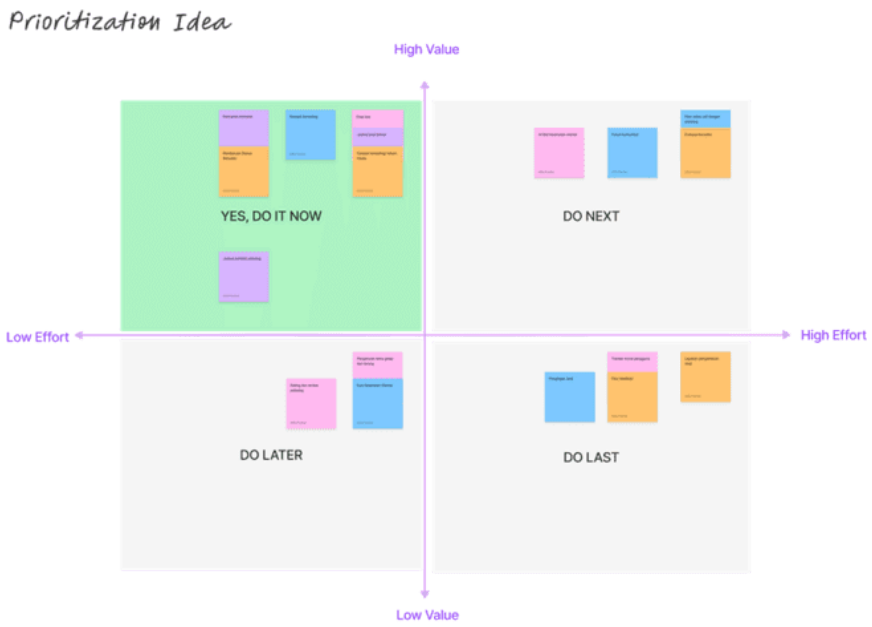

Figure 6. Prioritization Idea

After carrying out the idea prioritization process, the results of the features to be implemented can be seen in the Table 1.

Table 1. Implementation Features

No	Feature
1	Psychologist search feature
2	Description of the psychologist's practice schedule
3	Counselor status updates
4	Counseling history
5	Chat feature
6	Psychologists booking schedule for offline counseling
7	Counseling notes or medical records

4.3.3 *Flowchart*

The following is a counseling application flowchart in Figure 7.

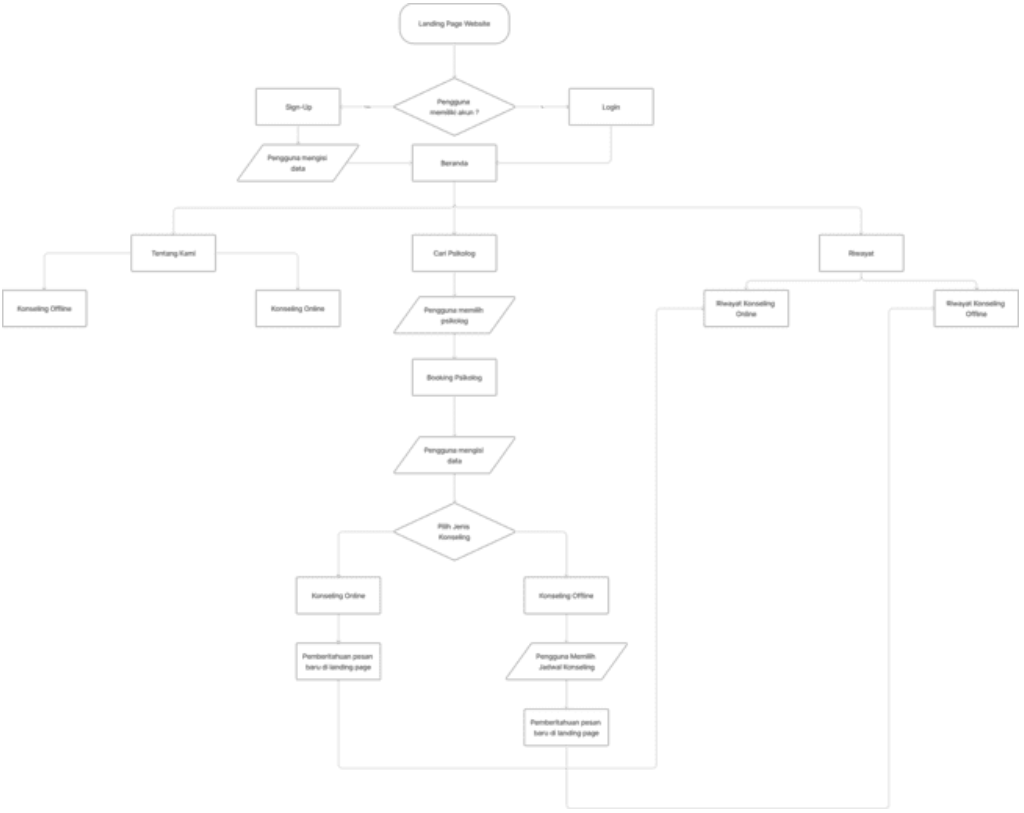

Figure 7. Flowchart of Application

4.3.4 *Wireframe*

After the application flowchart is created, these features will be implemented in wireframe form. Below is the counseling application wireframe in Figure 8.

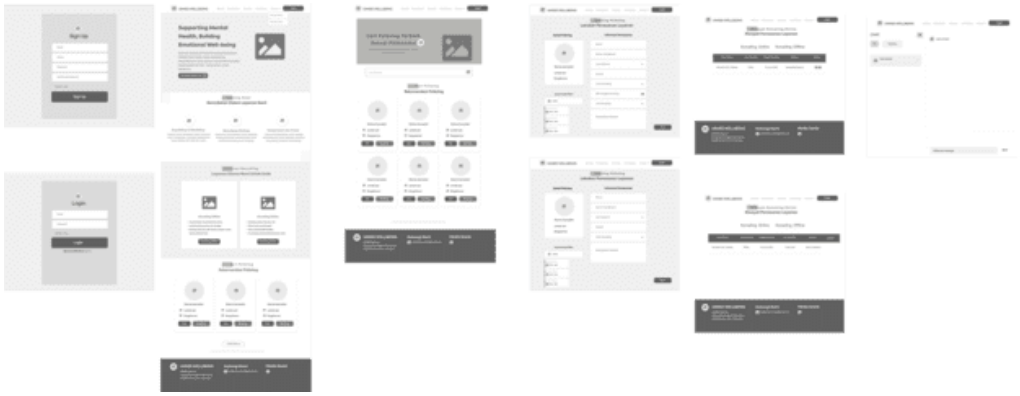

Figure 8. Wireframe

4.4 Prototype Result

At the prototype stage, further development is carried out from the previous ideate stage. The result of this design is the final appearance of the product. At the prototype stage, the process of creating an Entity Relationship Diagram (ERD), Unified Modeling Language (UML), system design, and high fidelity design is carried out.

4.4.1 *Entity Relationship Diagram (ERD)*

Entity Relationship Diagram (ERD) is a graphical representation of the relationship structure between tables in a database system. In this system, there are five main tables, namely client, counseling, psychologist, practitioner, and conversations. A more detailed visualization of the ERD is shown in Figure 9.

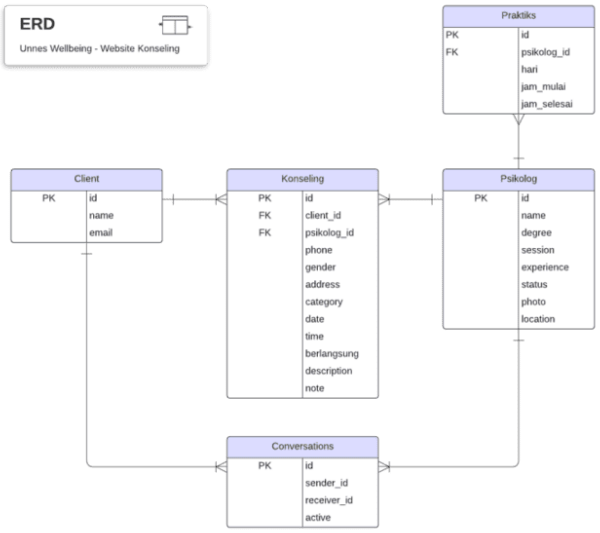

Figure 9. ERD System Design

The client table stores information about clients/users who use counseling services. The counseling table records the details of the counseling between the client and the psychologist. The foreign key 'psychologist_id' in the counseling table refers

to the ID value in the psychologist table, while the foreign key 'client_id' refers to the ID in the client table. This shows that each counseling is related to one psychologist and one client.

The psychologists table stores information about the psychologists involved in counseling. There is a one-to-many relationship between the psychologist table and the practice table, which means that one psychologist can have several practice schedules. Each practice schedule in the practice table has information about the day, start time, and end time.

Next, the conversations table stores the history of conversations between the client and the psychologist. This is implemented in the chat feature which can enable clients and psychologists to communicate online on the system platform and facilitate real-time interaction which can increase the effectiveness of counseling.

4.4.2 *Unified Modeling Language (UML)*

Unified Modeling Language (UML) is a method used to model, document and design a system. One type of diagram in UML is a use case diagram. Use case diagrams are used to describe interactions between users and systems as well as scenarios for using the system to achieve certain goals. The system design use case visualization in this research is shown in Figure 10.

Figure 10. Use Case System Design

There are scenarios or user/client interactions with the system, including being able to log in, register an account, communicate via the chat feature with a

psychologist, and print the results of counseling or medical records. Then psychologists can log in, chat with users, complete counseling, and print counseling results. Apart from that, admin interaction with the system includes completing counseling, creating a psychologist account, managing accounts, editing and deleting counseling, monitoring the list of psychologists and counsellors.

4.4.3 *Design System*

Design systems are used to make the appearance of products or services consistent. A design system includes elements such as visual style, layout, design patterns, and various other user interface elements. The purpose of creating a design system is to ensure that all parts of a product or service look similar and function well. By using a design system, a product can be developed more easily and efficiently. The following counseling application system design can be seen in Figure 11.

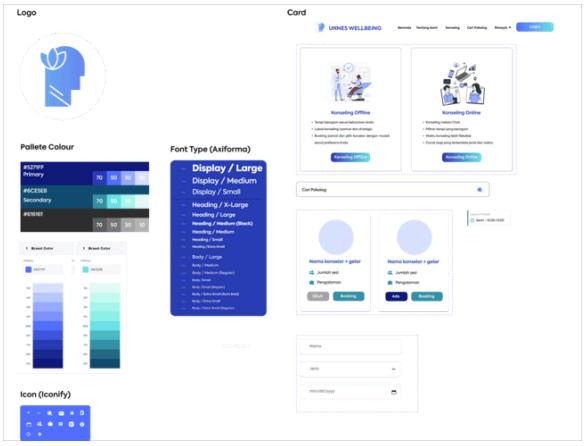

Figure 11. Design System

4.4.3 *High Fidelity Design*

High fidelity design is a stage in the design process where applications are created with a high level of detail and accuracy. At this stage, design often includes elements such as color, typography, images, animation, and interactions to approximate the final appearance and function of the product or service being developed. The high fidelity design stage is carried out after the low fidelity design or wireframe stage, where the basic concept and structure of the user interface have been identified. The following are the results of the high fidelity design of the website-based counseling application in Figure 12.

Figure 12. High Fidelity Design

4.5 Test Result

Testing is carried out to ensure that the designed solution has answered the main problem. Testing was carried out by distributing SUS questionnaires to assess the results of counseling to respondents. Respondents were randomly selected from the UNNES student population. The number of respondents who tested the application was 43 people. The following are the results of the usability test using SUS in Table 2.

Table 2. Usability testing

No	Statement	Score
1	I think that I would like to use this application	3.6 ± 0.7
2	I found application unnecessarily complex	1.5 ± 0.7
3	I thought application was easy to use.	4.3 ± 0.7
4	I think that I would need the support of a technical person to be able to use application.	1.6 ± 0.6
5	I found the various functions in application were well integrated.	3.8 ± 0.8
6	I thought there was too much inconsistency in application	2.6 ± 0.7
7	I would imagine that most people would learn to use application very quickly	4.4 ± 0.7
8	I found application very cumbersome to use.	2.1 ± 0.7
9	I felt very confident using application.	4.4 ± 0.6
10	I needed to learn a lot of things before I could get going with application.	2.5 ± 1.0
SUS Score		75 ± 7.0

From 43 respondents, the overall average SUS score was 75. Interpretation of the average score can be seen in the Table 3.

Table 3. SUS Score Interpretation

SUS Score	*Adjective Rating*	*Grade Scale*	*Acceptability Ranges*
75	*Good*	C	*Acceptable*

In this study the average SUS score was 75 (SD, 7.00) which indicates the Good category and received an acceptable predicate in the acceptability range category. This shows that the counseling application has good uses and has received acceptance from users as an application that is able to help students in conducting counseling.

4.6 Test Result

After testing using SUS, the next step is to carry out a validity test. The validity test is used to assess how accurate the measuring instrument used in the measurement is and whether the variable being measured corresponds to the variable you want to study. The results of the validity test are considered valid if the correlation coefficient at a significant level (0.05) on the total score is positive, and the validity test is carried out using the Pearson method. In addition, if the condition Rtest > Rtable means the validity test results are considered valid, where Rtable has a value of 0.301. The following are the results of the validity test using the Statistical Package for the Social Sciences (SPSS) in the Table 4.

Table 4. Validity Test

Variable	Rtest	Rtable	Result
Q1	0.593	0.301	Valid
Q2	0.438	0.301	Valid
Q3	0.406	0.301	Valid
Q4	0.404	0.301	Valid
Q5	0.643	0.301	Valid
Q6	0.489	0.301	Valid
Q7	0.522	0.301	Valid
Q8	0.518	0.301	Valid
Q9	0.384	0.301	Valid
Q10	0.586	0.301	Valid

From the results of the validity test using SPSS, the results of the data on the 10 statement items in the questionnaire have a smaller Rtable value, so this result states that the questionnaire statements are considered valid.

4.7 Reliability Test

Reliability testing was carried out thoroughly on each question using the Cronbach's Alpha (α) method. The measurement results show consistent values when measurements are carried out twice or more. The following are the results of the reliability test in Table 5.

Table 5. Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.670	10

Based on the results of the reliability test, the value obtained was 0.67 for the 10 statements in the questionnaire. Therefore, the alpha value (>) 0.60 is considered reliable. In other words, each question item on the questionnaire can be relied on or is considered consistent in measuring the variable you want to study.

5. CONCLUSION

Based on the research that has been conducted, the conclusion that can be drawn is that to design a new application using the design thinking method, the process begins with the empathize stage to understand the problem in depth, followed by the define stage to formulate a clear problem statement, the ideate stage to find various possible solutions. effective, and the prototype stage where these ideas are implemented in the form of an application with relevant features that can solve the main problem. After using a design thinking approach in the design process, it is necessary to test the application using the System Usability Scale (SUS). The results of testing the online counseling application using SUS got a score of 75, indicating that the online counseling application has good usability and has received acceptance from users as an application that is able to help students carry out counseling.

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