Mobile App Design to Help College Students Cope Mental Health Crisis During the Covid-19 Pandemic

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Abstract. The speed of transmission of the COVID-19 makes the spread of the virus difficult to control so that the number of Indonesians infected with the virus continues to increase every month. This pandemic is an event beyond prediction that makes the government issue policies in the education sector where the learning process ranging from Early Childhood Education level to Higher Education becomes online learning at home. These limitations of daily activities and communication provide an impact on people's social lives, namely the occurrence of mental health crises. Students as part of the youth order in society also feel the crisis of mental health caused by the COVID-19 pandemic. The purpose of this study was to find out the mental health of students during the COVID-19 pandemic and provide solutions in the form of mobile app that provide personal discussions with psychologists, sharing forums, and mental health education. It is hoped that this research can help overcome mental health problems during the COVID-19 pandemic and prevent them from unwanted things. The research method used in this research is the design thinking method that consists of empathize, define, ideate, prototype, and test.

1 Introduction

The COVID-19 pandemic is one of Indonesia's focuses because it is designated as a public health emergency by the Ministry of Health of the Republic of Indonesia. COVID-19 is an infectious disease that spreads through splashes from the nose or mouth of a person infected with COVID-19 while talking, coughing, or sneezing [1]. People infected with the COVID-19 virus will experience acute respiratory distress or even death. The speed of transmission of this virus makes the spread of the virus difficult to control so that the number of Indonesians infected with this virus continues to increase every month. This situation led the government to issue several policies, one of which is in the education sector where the learning process ranging from Early Childhood Education level to Higher Education becomes online learning at home.

This government-issued policy in the education sector forces large-scale change and adaptation for students, where activities and communication become more limited because they have to be done online. It affects the mental health of students, including college students. Based on research conducted by [2], the COVID-19 pandemic increases psychological problems affecting college students' mental health such as anxiety, stress, and depression higher when compared to normal times. The lack of social interaction makes students unable to communicate their feelings.

The purpose of this study is to find out the mental health of college students especially Visual Communication Design student in BINUS Malang

Campus during the COVID-19 pandemic as well as solutions to mental health crises experienced by students. This research is important to do because the prevalence of mental disorders from 2013 to 2018 has increased by 9.8% and can be said to be the highest number in the modern history of Indonesian health [3]. [1], also stated that the COVID-19 pandemic has affected the mental health of the world community where there is an increase in stress, anxiety, loneliness, even suicidal behavior. Students as the next generation of the nation also feel the impact. This research is expected to provide solutions to mental health crises experienced by college students and prevent them from getting worse and even take student lives.

1.1 Objectives

Through this research, solutions are offered in the form of mobile app that can help students especially Visual Communication Design student in BINUS Malang Campus in dealing with mental health crises experienced. Humans are social beings who need communication to meet emotional needs to maintain mental health [4]. Therefore, a mobile app is created that helps the communication process of students' feelings to maintain mental health during the COVID-19 pandemic by providing personal problem consultation services with psychologists, sharing forums, and mental health education. Implementation of Visual Communication Design can be seen through the design of the mobile app. This innovation participates in the development of science

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and technology (IPTEK) because this application is included in the advancement of communication technology and socialization between humans. Besides, it also influences society and culture because it participates in the welfare of people's mental health.

2 Literature Review

2.1 State of the Art

The following tables, Table 1. State of the Art Table, are list of the studies that have previously been done as a reference and support this research:

Table 1. State of the Art Table

Research 1	
Name and Year of Research	[5]
Research Title	Penanganan Masalah Pendidikan Oleh Reliever dalam Aplikasi Riliv
Research Methods	Qualitative Descriptive Method
Research Objects	Reliever (Psychologist) and Riliv Application
Research Results	Treatment by psychologists in the application of Riliv has not been effective because psychologists are often slow to respond, rarely online, and treatment is more towards psychic education.
Research 2	
Name and Year of Research	[6]
Research Title	Model *Cybercounseling*: Telaah Konseling Individu *Online Chat-Asynchronous* Berbasis Aplikasi *Android*
Research Methods	Case Study
Research Objects	*Cybercounseling*
Research Results	*Cybercounseling Chat-Asynchronous* is a text-based indirect interaction in teraupetic communication between clients and counselors using online chat. Even without verbal and physical observance, counseling relationships can take place resulting in "text-based bonding".
Research 3	
Name and Year of Research	[7]
Research Title	Perancangan Sistem Informasi Mi-Cure Berbasis Aplikasi Mobile
Research Methods	Qualitative Waterfall Model Method
Research Objects	Mi-Cure Mobile App
Research Results	Mi-Cure is an android-based application engaged in mental health by making it easier for users to communicate with psychologists.

2.2 COVID-19

Since December 2019, the world has been shocked by the spread of coronavirus that causes acute respiratory distress in Wuhan, China. The disease is identified as COVID-19. COVID-19 stands for "CO" which means "Corona", "VI" which means "Virus", "D" which means "Disease", and "19" which refers to the year of the beginning of the spread of diseases resulting from this virus as short for "2019 novel coronavirus" [8]. People exposed to the disease will experience respiratory distress with mild to severe symptoms that appear gradually, can even lead to death. COVID-19 is an infectious disease that spreads through splashes from the nose or mouth when someone infected with COVID-19 speaks, coughs, or sneezes [1].

Indonesia is one of the countries exposed to COVID-19. Since the beginning of 2020, the disease has been designated as a public health emergency that is troubling the world due to the rapid spread of the virus [9]. The number of Indonesians infected with this virus continues to increase every month. The situation beyond this prediction led the government to issue policies in the field of education, where the school learning process ranging from Early Childhood Education to Higher Education to home learning. [10].

2.3 Mental Health

According to the World Health Organization [11], "mental health is a condition of the well-being of individuals, in which there are abilities to manage the stress of a reasonable life, to work productively and produce, and to participate in their communities". Good mental health makes all other aspects of life can work more optimally. The work of mental functions in a person causes [12]:

1. Able to do productive activities in their area of life.
2. Able to have efficient interpersonal relationships with others.
3. Able to adapt or adjust to life changes experienced, both in small-scale, medium-scale, and large-scale life changes.
4. Able to get around the failures of life experienced to rise again.

In Indonesia, based on the Basic Health Research report [3], the prevalence of mental disorders from 2013 to 2018 has increased by 9.8% and can be said to be the highest number in the modern history of Indonesian health. [1], also stated that the COVID-19 pandemic has affected the mental health of the world community where there is an increase in stress, anxiety, loneliness, even suicidal behavior.

2.4 Characteristics of Good Mental Health

According to [12], individuals who have good mental health have the following characteristics:
1. Have a feeling of happiness and satisfaction in living life.
2. Have a passion for living life (the ability to enjoy life, joy, and other pleasures).
3. Have the power to live in the face of life stress and rise from the failures of life experienced.
4. Have the ability to realize themselves, namely the ability to participate in life by the best potentials that exist in him through various meaningful life activities and positive social relationships.
5. Have the ability of flexibility, namely the ability to change, develop, and experience various feelings in line with changing living conditions.
6. Have feelings about the wholeness of life's view that includes views on the spirit, soul, body, creativity, and intellectual development.
7. Have concern for yourself and others.
8. Have confidence and a good self-assessment of yourself.

Besides, they are also able to fulfill five tasks and twelve sub-tasks in their life activities. Here are the five tasks:
1. Understand the essence of spirituality.
2. The balance between work and make the most of your free time.
3. Developing friendships.
4. Developing love.
5. Independent.

Here are the twelve subtasks:
1. Have a meaningful feeling for yourself.
2. Have a feeling of control
3. Have realistic beliefs.
4. Emotional awareness and coping.
5. Problem solving and creativity.
6. Have a sense of humor.
7. Obtain sufficient nutrition.
8. Doing sports
9. Have concern for yourself.
10. Have the ability to manage stress.
11. Have an awareness of identity gender.
12. Have an awareness of identity culture.

2.5 College Student

According to [13], students are people who are studying in universities, institutions or, academies. According to [13], students have the following characteristics:
1. Have the ability and opportunity to study in college so that it can be classified as intellectuals.
2. Because of the above opportunities, it is expected to act as a capable and skilled leader, both as a community leader and in the world of work.
3. It is expected to be a dynamic driving force in the modernization process.
4. Expected to enter the world of work as a qualified and professional workforce.

2.6 Cybercounseling

According to [6], cybercounseling is a type of professional counseling in which counselors and clients are separated by distance and communicate using electronic media over the internet. Despite the absence of vocal and physical indicators, counseling connections can develop and reach a level of intensity known as "text-based bonding."

2.7 Mobile Apps

According to [14], a mobile app (short for the mobile application) is an application software designed to run on a smartphone, tablet computers, and other mobile devices. Apps are available via distribution platforms on app stores such as Apple Apps Store, Google Play, Nokia Ovi Store, Windows Phone Marketplace, and Amazon App Store.

2.8 UI/UX

According to [15], a UI (short for the user interface) refers to a system and a user interaction through commands or techniques to operate the system, use the contents, and input data. While a UX (short for the The term "user experience" refers to the total feeling, thinking, reaction, and behavior that a user has as a result of his direct or indirect use of a system, content, product, or service.

The exponential growth of mobile app download indicates the importance of designing and developing a mobile app. According to [15], there are changes in UI/UX design elements following bellow:
1. Evolution of Minimal Design
   Minimalist design focuses on user content and establishes a connection via clear visual communication.
2. Increase in Micro Interaction
3. Moving Pictures
4. Rich Color and Sensuous Typography
   Rich and bright colors are used as user interfaces. The typography is represented using sharper color palettes, bold gradient color, and duotones.
5. Long Scrolling and Parallax Technique Websites

2.9 Principles and Practices for Designing Mobile Apps

According to [16], here are some design components that can be a guide to compose an easy-to-use application design:
1. Consistency
   Consistency of user interface view.
2. Hierarchy
   Arrangement of objects contained in the application.
3. Personality
   First impressions that are seen on the application that shows the characteristics of the application.
4. Layout
   The layout of the elements in an application.
5. Type

The typography that is used in an application.
6. Color
   Proper use of color on the application.
7. Imagery
   Use of images, icons, etc. to convey information in the application.
8. Control and Affordances
   Elements of the interface users that people can use to interact with the system through a screen.

2.10 Material Design Guidelines

Material Design is a framework for the visual design of Google products and here are some of the components to be analyzed in this study:

1. Layout
   By using uniform elements and spacing, layouts provide consistency across platforms and screen sizes. Here are some guidelines of the layout:
   • Principles
   - Use predictable layouts with a spatial organization and UI regions.
   - The layouts should be consistent by using grids, padding, and keylines.
   - The layouts should be responsive.
   • Material dimensions
   Layouts in Material Design should be visually balanced. The 8dp grid is used for the majority of the measures, but minor components like icons can be aligned to a 4dp grid.
   • Responsive layout grid
   The content in a responsive layout grid adapt to screen sizes and orientations, guaranteeing consistency across layouts. Here are the materials:
   - Columns
     The content is presented in the column-containing sections of the screen. The number of columns displayed in the grid is governed by the breakpoint range (the range of fixed screen sizes).
   - Gutters
     Gutters are the spaces between columns that assist in content separation. Gutter width can be adjusted at various breakpoints to better adapt to different screen sizes. It can also be tweaked to add or subtract space between columns in a layout.
   - Margins
     The gap between content, as well as the screen's left and right edges, is known as the margin. At different breakpoints, the margin width can be modified to better adapt to the screen. It can also be changed to add or subtract space between the content and the screen's edge.

2. Color
   The color system helps to create a color that reflects the brand. Here are some guidelines of the color:
   • Color usage and palettes

Consists of the brand's basic and secondary colors, as well as dark and light variations of each hue.
• Principles
- It indicates which elements are interactive, their level of prominence, and how they relate to other elements.
- When text and key elements show on colorful backgrounds, they must meet legibility criteria.
- It must be expressive, displaying the brand colors at key occasions.
• The baseline material color theme
- Primary color
  The primary color is the one that occurs most frequently on the screens and components of the app. Dark and light dominant color variations are included.
- Secondary color
  To enhance and distinguish the product, a secondary color is applied. It is not required to use a secondary color. These colors work well with floating action buttons, selection controls, highlighted text, progress bars, links, and headlines. The secondary color, like the primary color, can have dark and light variations.
- Surface color
  Colors on the surface of components such as menus have an impact, etc.
- Background color
  The scrollable content is hidden beneath the background color.
- Error color
  The error color indicates component faults.
• Text legibility
  All text should meet accessibility WCAG (The Web Content Accessibility Guidelines (WCAG 2.0)) Standards.
- Text on colored backgrounds
  White text is recommended for use on dark backgrounds, while the black text is recommended for use on light backgrounds.
- Using text opacity
  Create contrast by displaying white or black text with reduced opacity rather than using grey text on top of colored backgrounds
- Colored text and backgrounds
  Colored text can draw attention and apply selective emphasis, it should be used as headlines, buttons, and links.
- Dark text on light backgrounds
3. Typography
   Typography should be used as clearly and efficiently as possible.
4. Iconography
   Iconography is visual images and symbols that express the brand. The iconography consists of:
   • Product icons

The visual expression of the brand's products, tools, and services.

- System icons
  Symbolize common actions, devices, files, and directories.
- Animated icons
  Reflects the action an icon performs in a way that adds delight and polish.

5. Shape
   The material surfaces can be displayed in different shapes. Here is the usage of shape:

   - Emphasis
     A unique shape can direct attention to different parts of a screen.
   - Identity
     The shape makes the users recognize components and identify different material surfaces.
   - State
     Using a different shape from the rest of the elements of surfaces in the group help to communicate an element's change of state.
   - Branding
     It is used to express a brand's visual language throughout an app.

2.11 Color Psychology

According to [17], colors affect emotions, preferences, behaviors, and physiology in many different ways. Following are color psychology based on its hues:

1. Warm Hues
- Red: powerful and generally liked, passion and romance, danger and mistakes, intimidation, and eye-catching
- Yellow: happy, brightness, warmth, soothing, and attracting attention.
- Orange: happy, attracts attention and increases hunger.
2. Cool Hues
Cool hues are regarded as more calming and well-liked by the general public.
- Blue: lowering blood pressure, stimulating creativity, stifling hunger, and relaxation.
- Green: Associated with nature and trees, nausea, toxicity, and a psychologically neutral color that represents a withdrawal from stimuli.

2.12 Roadmap

A roadmap is a strategic plan that helps a researcher to defines a goal. It includes some steps that needed to be reached. Figure 1. Roadmap Research below describes the processes and strategies in research and product design processes.
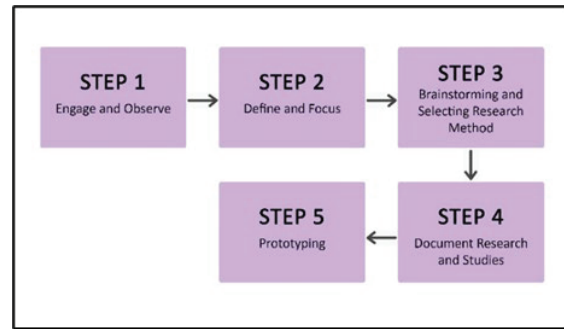

Fig. 1. Roadmap Research

1. Step 1: Engage and Observe
   Engage with the target audience and observe the challenges they face, needs, and expectations.
2. Step 2: Define and Focus
   The findings should be condensed to a clear single problem statement.
3. Step 3: Brainstorming and Selecting Research Method
   Created several potential solutions, then conceptualized the best and select the research method.
4. Step 4: Data Research and Studies
   Do literature studies and data research.
5. Step 5: Prototyping
   The data obtained from the research will be used to create and develop the prototype.

3 Methods

This study employed the following research method: a design thinking method consisting of empathize, define, ideate, prototype, and test. The data collection method used is the quantitative method in the form of a survey by distributing questionnaires to respondents.
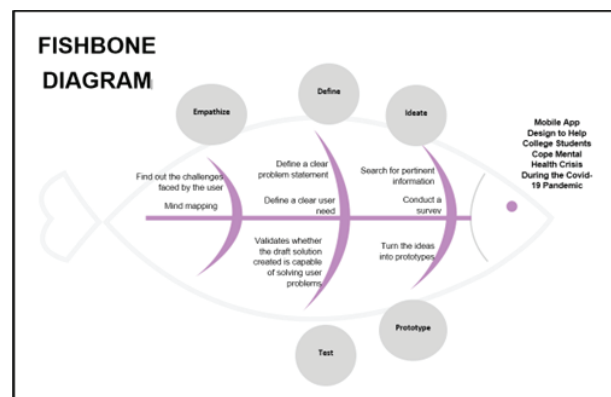

Fig. 2. Fishbone Diagram of Design Thinking

The design thinking framework can be divided into five actionable steps. Based on Figure 2. Fishbone Diagram of Design Thinking above, the following are the details of the steps that have been carried out and will be carried out during the research:
1. Empathize

Find out the challenges faced by the user and mind mapping.
2. Define
Define a clear problem statement and user need.
3. Ideate
Search for pertinent information and conduct a survey.
4. Prototype
Turn the ideas into prototypes.
5. Test
Validates whether the draft solution created is capable of solving user problems.

3.1 Research Participants

The sample population of the result was 50 undergraduate students, consists of 30 women and 20 men. The population was limited to first- and second-year students. These students were in the 18-23 age group.

3.2 Instrument

The instrument used for analysis was a questionnaire survey. The questionnaire contained questions about a student's mental health condition as well as the solutions offered. The media used is Google Form that is distributed through the instant messaging app.

3.3 Survey

The following is a flow chart containing questions asked to respondents. In Figure 3. Flow chart of the questionnaire shows the flow of questions asked to respondents:
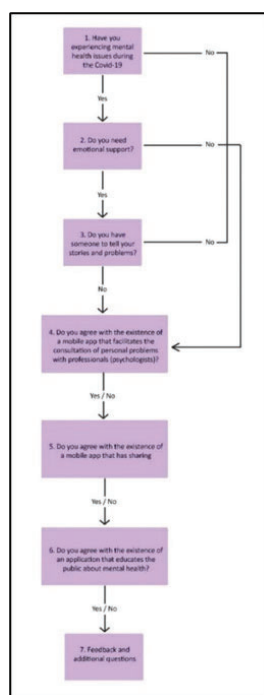

Fig. 3. Flow chart of the questionnaire

4 Data Collection

Most respondents experienced mental health issues during the COVID-19 pandemic, such as excessive sadness, frustration with small things, sleep disturbances, difficulty concentrating, experiencing excessive anxiety or anxiety, and loss of pleasure in performing normal activities. During these experiences, respondents needed emotional support but most of them did not yet have someone to tell the story and problems.

Therefore, researchers proposed a solution to maintain the mental health of students in the form of a mobile app that provides personal problem consultation services with psychologists, sharing forums, and mental health education. Through the survey, data obtained those 49 respondents agreed with the existence of an application that facilitates consultation of personal problems with psychologists, 43 respondents agreed with the existence of applications that facilitate sharing forums, and 50 respondents agreed with the existence of educational facilities on mental health in the form of videos.

5 Result and Discussion

5.1 Target User

The main target users of this design are college students who are experiencing mental health issues and need help. Users are men and women who have an age range of 18-25 years. Secondary targets are all stages of age that require help or education about mental health.

5.2 Mobile App Name

"Eunoia" means a feeling of goodwill, as well as being friendly and wanting to help. As the name implies, Eunoia mobile app helps the process of communication of students' mental health issues during the Covid-19 pandemic by providing personal problem consultation services with psychologists, sharing forums, and mental health education.

5.3 Specifications for Mobile App

The mobile app uses the Android platform with a minimum specification of OS 7. RGB color scheme 72dpi resolution. Size screen 1080 px X 1920 px.

5.4 Color

The color used is predominantly blue. The tone used can be seen in the image below, in Figure 4. Mobile App Color Scheme. Based on the literature review, the color blue calls to mind feelings of calmness or serenity. It is described as peaceful, secure, tranquil, and orderly. Blue can also lower the pulse rate. This color is often seen as a sign of stability and reliability. Through this color, the researcher wants to show Eunoia reliability, security, and sincerity. Also, the researcher wants to give a calm and

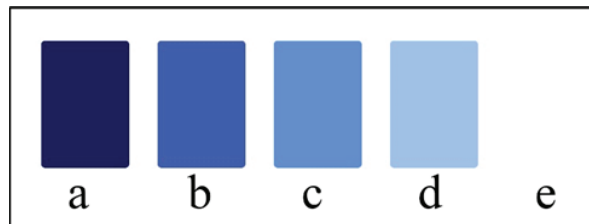serenity to the user while using the mobile app. Here is the color scheme that used for the mobile app:

Fig. 4. Mobile App Color Scheme

    a.   Color name   : Dark Imperial Blue
            Hex Code   : #00E62
            RGB Code   : (0, 14, 98)
            CMYK Code   : 1, 0.857, 0, 0.165
    b.   Color name   : Liberty
            Hex Code   : #435EAB
            RGB Code   : (67, 94, 171)
            CMYK Code   : 0.608, 0.450, 0, 0.329
    c.   Color name   : United Nations Blue
            Hex Code   : #5B92E5
             RGB Code   : (91, 146, 229)
            CMYK Code   : 0.602, 0.362, 0, 0.101
    d.   Color name   : Baby Blue Eyes
            Hex Code   : #9BC4FC
            RGB Code   : (155, 196, 252)
            CMYK Code   : 0.384, 0.222, 0, 0.011
    e.   Color name   : White
            Hex Code   : #FFFFFF
            RGB Code   : (255, 255, 255)
            CMYK Code   : 0, 0, 0, 0

5.5 Typography

The font that used in the mobile app is Arial Rounded MT. Arial Rounded MT has a simple and clean appearance that represents Eunoia mobile app. This font has excellent legibility characteristics and easy on the eyes. The difference between the two characters can be seen in Figure 5. Mobile App Font which is seen below.
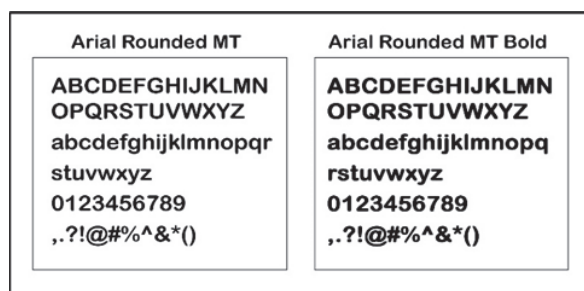

Fig. 5. Mobile App Font

5.6 Logo

The design for Eunoia mobile app logo is simple and comfortable to look at. The type of logo is logotype. Sans-serif typeface is used because of the simple and clean appearance. United Nations Blue and baby blue eyes are used to represent Eunoia's reliability, security, and sincerity. The final logo can be seen on Figure 6. Mobile App Logo. A lighter shade of blue is given to the letter "O" because the circle symbolizes security, protection, community, and support. Through this, researchers want to confirm that Eunoia is a mobile app that will provide security, protection, community, and support to the user.

Fig. 6. Mobile App Logo

5.7 Iconography

The visual images and symbols that use for the mobile app must be simple, clear, and clean. It should use a defined mobile app color scheme. The final the symbolized product icons of brand tools such as message, search, my profile, and trash is shown in Figure 7. Mobile App Iconography pictures below:
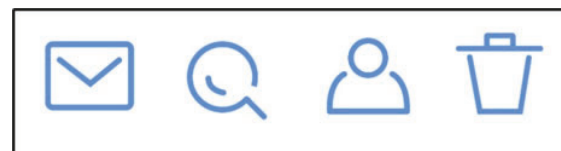

Fig. 7. Mobile App Iconography

5.8 Design Style

The design style used for Eunoia mobile app is flat design. Flat design is a style that uses simple 2-dimensional elements and bright colors. This type of design style is streamlined, simple and clean, modern, and delivers information fast. All of the illustration and icon that used in the mobile app should be using flat design and defined color scheme.

5.9 Visual Display

Based on the design concept, Figure 8. Mobile App Visual Display is the final visual display of the mobile app:

Fig. 8. Mobile App Visual Display

New users are required to register to create an account. Registration is done by filling in some important data such as first name, last name, username, password, date of birth, gender, phone number, and location that will then be saved to the database. After registering, users will be redirected to the sign-in page. Users are required to fill in the username and password that have been registered before. After filling in the username and password, the user will be directed to the main page of the application. Then users can choose the necessary options, namely counseling, sharing forums, or mental health education. On each page, there is a tab-bar containing menus to facilitate movement.

On the mental health education page, there are various options such as videos, podcasts, and articles. These media contain various things about mental health such as knowledge, prevention, symptoms, types, and others in part. On the counseling page, the user can choose available psychologists. After that, the user can do counseling or consultation with a psychologist. Counseling can be done via chat, phone, or video call directly with a psychologist. After counseling, there are health reports as well as reviews of conversations that can be read back. All of the health reports will be recorded so they can be reread by the user. On the forum page, users

can share stories about mental health or moments with other users. Users can also change profiles such as profile photos and names.

5.10 SWOT Analysis

- Strength
  - Monitoring the state of the user every day.
  - There is a counseling facility with a professional psychologist.
  - There is a forum facility to share stories.
  - There are mental health education facilities.
- Weakness
  - Looking for a psychologist who is willing to be a partner for charitable efforts.
- Opportunities
  - Students who have a mental health issue are sufficient many and predicted will continue to increase during the COVID-19 pandemic.
  - Students who have mental health issue do not dare or do not have someone to share their stories and problems.
- Threat
  - Many students have mental health issues that reluctant to share his or her difficulties.
  - Similar mobile app

6 Conclusion

Government-issued policies in the education sector force large-scale change and adaptation for students, where activities and communication become more limited because they have to be done online during the COVID-19 pandemics. This leads to an increase in mental health problems experienced by college students such as anxiety, stress, and depression when compared to normal times. The lack of social interaction makes students unable to communicate their feelings. Whereas humans are social beings who need communication to meet their emotional needs. Through the survey that has been done, data obtained on what is needed by college students who experience mental health issues. Therefore, a mobile app is created that helps the communication process of students' feelings throughout the COVID-19 epidemic to maintain mental health by providing personal problem consultation services with psychologists, sharing forums, and mental health education. This mobile app is designed in such a way as to implement Visual Communication Design studies in order to provide comfort and convenience for users.

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