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Therapist: Development of a Mobile Application on Emotional Control Guidance and Mood Charts for University Students

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Abstract: Emotional control referred to the ability to understand and manage our emotions, while a mood chart was a tool that recorded a person's mood at regular intervals. In this competitive era, university students are the individuals who are full of emotional pressure. However, Malaysian university students' mental health is exacerbated by their insufficient emotional awareness. Hence, a mobile application namely "Therapist" was developed to provide guidance for emotional control and mood charts for assisting university students based on DASS-21 psychological inventory model and the functional testing was performed to target users. Multimedia Mobile Content Development (MMCD) approach was used to develop Therapist mobile application. The usability testing has resulted in a score of 86.25% which is within the acceptable range based on the System Usability Scale (SUS). Therefore, it can be concluded that the Therapist application can be used as an emotional guidance and mood chart recorder.

1.   Introduction

In recent years, the increasingly competitive character of higher education has resulted in an increase in typical academic pressures among university students, making university students the riskiest group of people with mental health disorders. How individuals can achieve emotional control, have implications for health and well-being [1]. A mood chart is a tool that records a person's mood at regular intervals. This sort of tool seeks to identify patterns in how emotions change over time and in response to various situations and conditions [2]. The DASS-21 model is a psychological test that measures the scales of depression, anxiety, and stress for the general public [3].

According to the data acquired from the DASS-21 inventory survey, among 355 Malaysian university students, 44.2% of them were occasionally feeling depressed by experiencing negative [4]. To meet the growing demand for mental health assistance, the government provides much mental support collaboration across agencies, mental health promotion, mental health programs, and

counseling departments in each university. Nevertheless, despite the government's efforts to promote awareness, Malaysian students' mental health remains a challenge, made worse by students' poor help-seeking and consultation due to feelings of worthlessness or shame. Lack of emotional awareness and negative attitudes regarding emotional control contribute to a rise in mental health problems among university students [5]. Nowadays, practicing emotional control is essential in almost all situations, and its effectiveness can be enhanced through the implementation of technology to promote adherence. Therefore, the proposed project is to develop a mobile application called "Therapist" to promote guidance for emotional control and mood charts for university students.

The objectives of this study are to design Therapist mobile application based on the DASS-21 inventory model, to develop an android platform that provides self-journal, emotional control guidance and mood charts for university students, and to perform functional testing and user acceptance test on the developed application to the target user. This application is proposed to provide guidance for managing and controlling emotion in the right ways. Besides, the application will provide a function of recording emotions and moods daily by giving options to enable users to choose their feelings for the day. This application will provide mood patterning that can be concluded and viewed in a mood chart weekly and monthly. Moreover, the application also provides a journal space that can safely express their expression and write their thoughts. The application also provides a short deep breathing exercise by using a timer. Lastly, the application will provide some reflective questions and positive vibes to provide positive and relaxing thinking.

The rest of the paper is arranged as follows: Section 2 covers the domain of study, the approach used, and the result of the comparative analysis. Section 3 describes the Multimedia Mobile Content Development (MMCD) methodology that is chosen to apply in this project, as well as the output of the analysis and design phases of this project. Furthermore, Section 4 presents the results and discussion, and Section 5 states the conclusion of the project.

2.   Related Work

In this section, the study domain, technology used, and result of the comparative analysis are discussed.

2.1   Emotional Control

Emotion has a significant impact on university students' mental health. Emotion is a powerful motivator of human behavior, influencing cognitive activity, behavior selection, personality formation, and interpersonal relationship management. As a result, it is critical for every individual to effectively manage their emotions. Bipolarity in positive and negative emotions, tension and relaxation, excitement and calmness characterize university students in the transition period from susceptibility to stability in psychological development. Hence, individuals must learn to control their emotions and perform the positive function of positive emotions. The ability to recognize, monitor, and drive one's own emotions, as well as the ability to recognize and respond appropriately to surrounding situations, is a type of good psychological characteristic [6]. The psychological and educational communities have clearly recognized that developing university students' emotional control abilities is a critical issue related to their adaptation to society, survival, and development [7].

2.2   Approach Used

The related approach used for this project is the Depression Anxiety Stress Scale 21 (DASS-21) inventory model [3]. The Depression Anxiety Stress Scale which is known as DASS-21 is a self-report scale used to measure negative emotional states such as depression, anxiety, and stress The DASS is based on a dimensional, rather than a categorical, view of psychological disorders, and scores emphasize the severity of a person's symptoms rather than diagnostic cutoff points. The DASS-21 is a modification of the original 42-item DASS developed by Lovibond et al. in 1995 [9]. The DASS-21 is divided into

three subscales which are depression (DASS-D), anxiety (DASS-A), and stress (DASS-S) [8]. In other words, high test scores indicate that you are likely suffering from low quality of life and emotional disturbances. This test, however, does not provide a diagnosis of mental health disorders or assist in determining the underlying causes of these negative emotions [9].

2.3 Comparative Analysis

In this section, a comparison has been made between existing applications, such Reflexio-Mood Tracker Journal [10], Mood Tracker: Self-Care Habits [11], and Tochi-Mood Tracker, Journal [12]. Figure 1 shows the main interface of the three existing applications. Meanwhile, 7 features have been discussed, as shown in Table 1. It includes the operating system, emotional guidance modules, mood tracking modules, DASS-21, content, multimedia elements, and advertisement.
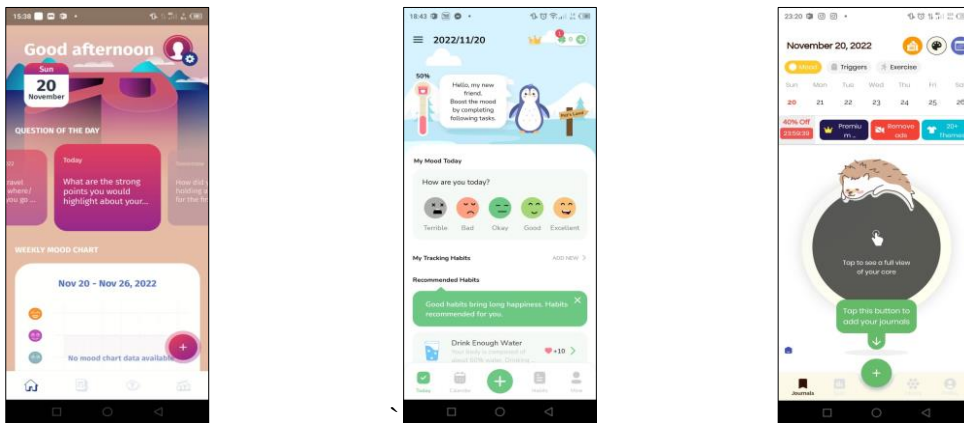
Figure 1(a): Reflexio [10]   Figure 1(b): Mood Tracker [11]   Figure 1(c): Tochi-Mood Tracker [12]

Table 1: Comparison between existing applications and proposed application

Features	Reflexio	Mood Tracker	Tochi Mood Tracker	Therapist
Operating System	Android 5.0 and above	Android 6.0 and above	Android 5.0 and above	Android 5.0 and above
Emotional Guidance Modules	Do not contain any emotional guidance module			Contain emotional guidance module with six categories (sadness, fear, anger, depress, stress, anxiety)
Mood Chart Modules	Available with daily, monthly, and yearly chart	Available with the weekly chart	Available with weekly and monthly	Available with weekly, and monthly
DASS- 21	Do not contain DASS-21 self-test			Provides DASS-21 self-test and guidance based on DASS-21 measurement
Content	Wellbeing, self-care, and self-improvement			Self-care, mental health emotion and habits builder

Based on Table 1, three of the other existing applications do not contain any emotional guidance module, while the proposed application will include emotional guidance with six emotion categories to

enhance the user's understanding of various emotions. Additionally, three of the other existing applications do not offer the DASS-21 self-test, whereas the proposed application will provide the DASS-21 self-test based on measurements, allowing users to monitor their mental health status within the application. By incorporating these additional features, the proposed application becomes more practical and useful in managing mental health compared to the existing applications.

3. Methodology

Multimedia Mobile Content Development (MMCD) Methodology [13] has been chosen in the process of development for Therapist application. MMCD consists of the MMCD Framework and MMCD Methodology for developing mobile learning (m-learning) applications. MMCD is based on an agile development model, which is widely supported by today's mobile application development [13]. MMCD Methodology includes five main components that arrange accordingly from stage 1 to stage 5 which are the application idea creation stage, structure analysis stage, process design stage, main function development stage, and testing stage which are shown in Figure 2. Next, each phase of the MMCD is discussed in the following subsections.
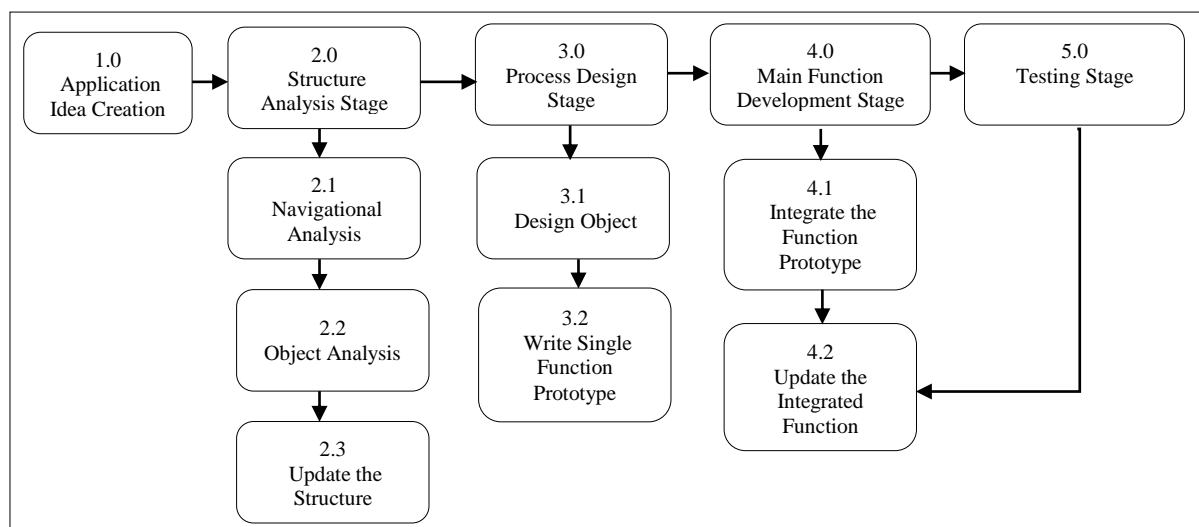
Figure 2: MMCD Methodology [13]

3.1 Application Idea Creation

Application idea creation is the first phase of MMCD methodology. In this phase, the information required before the design and development of the Therapist is determined. Two information gathering methods have been used to identify user requirements. Firstly, an interview session was conducted with a Subject Matter Expertise (SME), Dr. Aspalaila Binti Abdullah, the Deputy Head Officer of Universiti Tun Hussein Onn Malaysia Counselling Centre. In addition, a set of questionnaires was prepared and distributed to the target users via Google Forms. Based on Figure 3 and 4, a total of 30 responses from both public and private university students have been collected. The university involved in this questionnaire are BrickFields Asia College, Monash University, Raffles University, Sunway College, Southern University College, Multimedia University, Universiti Tunku Abdul Rahman, Universiti Sains Malaysia, Universiti Putra Malaysia, Universiti Teknologi Malaysia, Universiti Malaya, Universiti Selatan Kolej, Universiti Pendidikan Sultan Idris, Universiti Malaysia Sabah (UMS) and Universiti Tun Hussein Onn Malaysia.

To summarize, the majority (76.7%) of the respondents agreed that the application will better help them to understand their mood patterns and manage emotions, and 86.7% of respondents preferred a

free-to-download application and a simple and clean user interface. The results of the user analysis are tabulated in Table 2. Table 3 shows the application idea creation checklist.
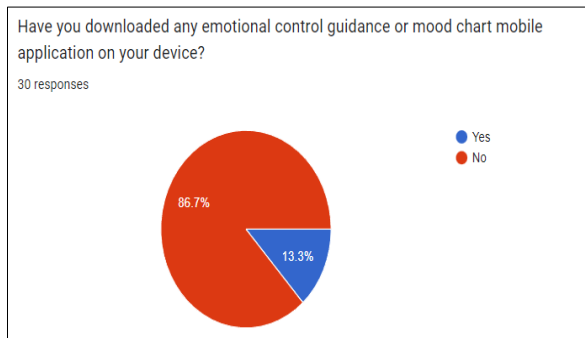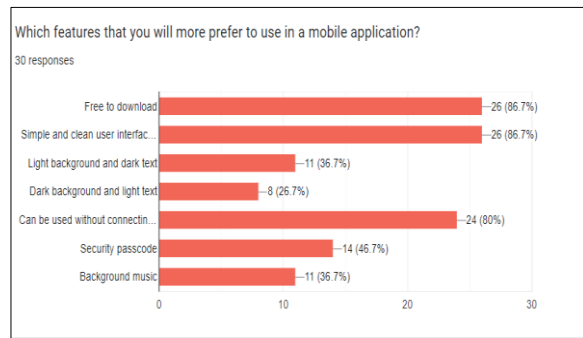

Figure 3: User experience analysis

Figure 4: Preferable multimedia elements

Table 2: User Analysis

Stakeholder Category	Role in product	Design Implications	Actions Needed
Subject Matter Expert (SME), Dr. Aspalaila Binti Abdullah	Content consultant expert in the psychological field	Content can be based on the DASS-21 model	• Get a DASS -21 model and use it as a guideline in putting the content.
		Ease of use	• Avoid using unnecessary buttons to reduce confusion. • The size of the buttons must be consistent.
		Easy to navigate	• Contains back, exit, and app guide buttons. • Apply consistent size for all buttons based on their category. • Do not apply complex navigational structures in the app.
		Provide well-proven guidance	• Apply professional guidance in content.
		Simple user interface design	• Used icon-based button instead of text.
General User (University Student)	End-user of the application	Free to download	• Therapist must be created as a free-to-download application.
		Simple and clean interface	• The interface of Therapist must be simple and clean.
		The light background and dark text	• The interface of Therapist shall be in a light background with dark and clear text.
		Offline based	• Therapist must be created as an offline-based application.

Table 3: Application Idea Checklist

Item	Description
Type of application	Mobile application .

Item	Description
Target device	Android platform.
Target users	University students.
GUI (Graphical user interface)	Login module, Registration module, Dashboard module, Emotional Guidance module, Self-Reflective Questions and Quotes module, Mood Chart module, Journal module.
Application Setting	Smooth 60 fps performance on most modern devices. The resolution settings compatible with different screen sizes and pixel densities.
Images	Icons, images of content elements.
Video	Relaxing video.
Animation	Application opening transition.
Audio	Relaxing music.
Application synopsis	Therapist is a mobile application to provide guidance for emotional control and provide function of recording emotions and moods in the form of mood charts for university students.

3.2   Analysis the Structure

In the second phase of the MMCD methodology, the structure of the application to be developed is analyzed. The object and navigation analysis has been conducted. The text in the buttons used in the application mainly used capital letters to help clarify the label's meaning, and the buttons aimed to use orange, white, and green colors to contribute to visual consistency across the user interface. Figure 5 shows the navigation structure and Figure 6 shows the flowchart of the application to analyze the application structure. Functional and non-functional requirements are listed in Table 4 and Table 5. The structure of the application kept getting updated throughout the analysis stage.
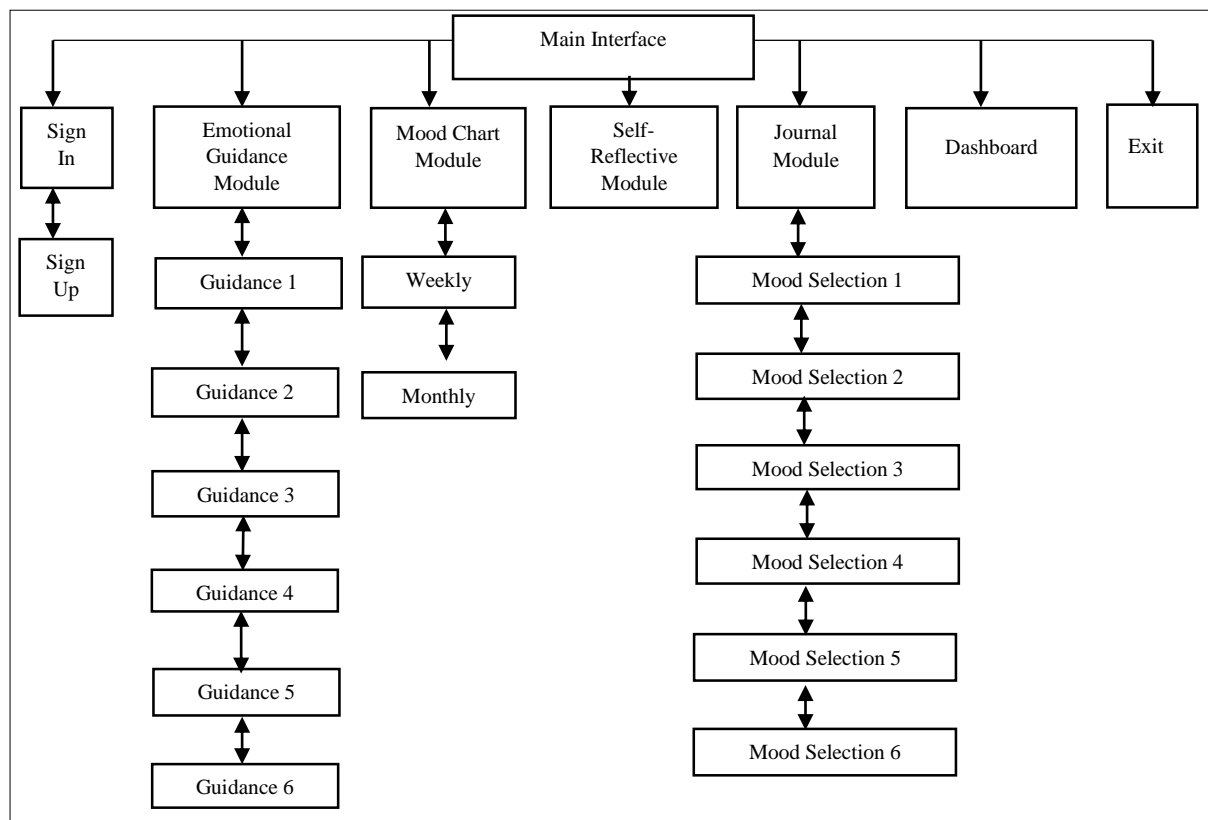
Figure 5: Navigation Structure
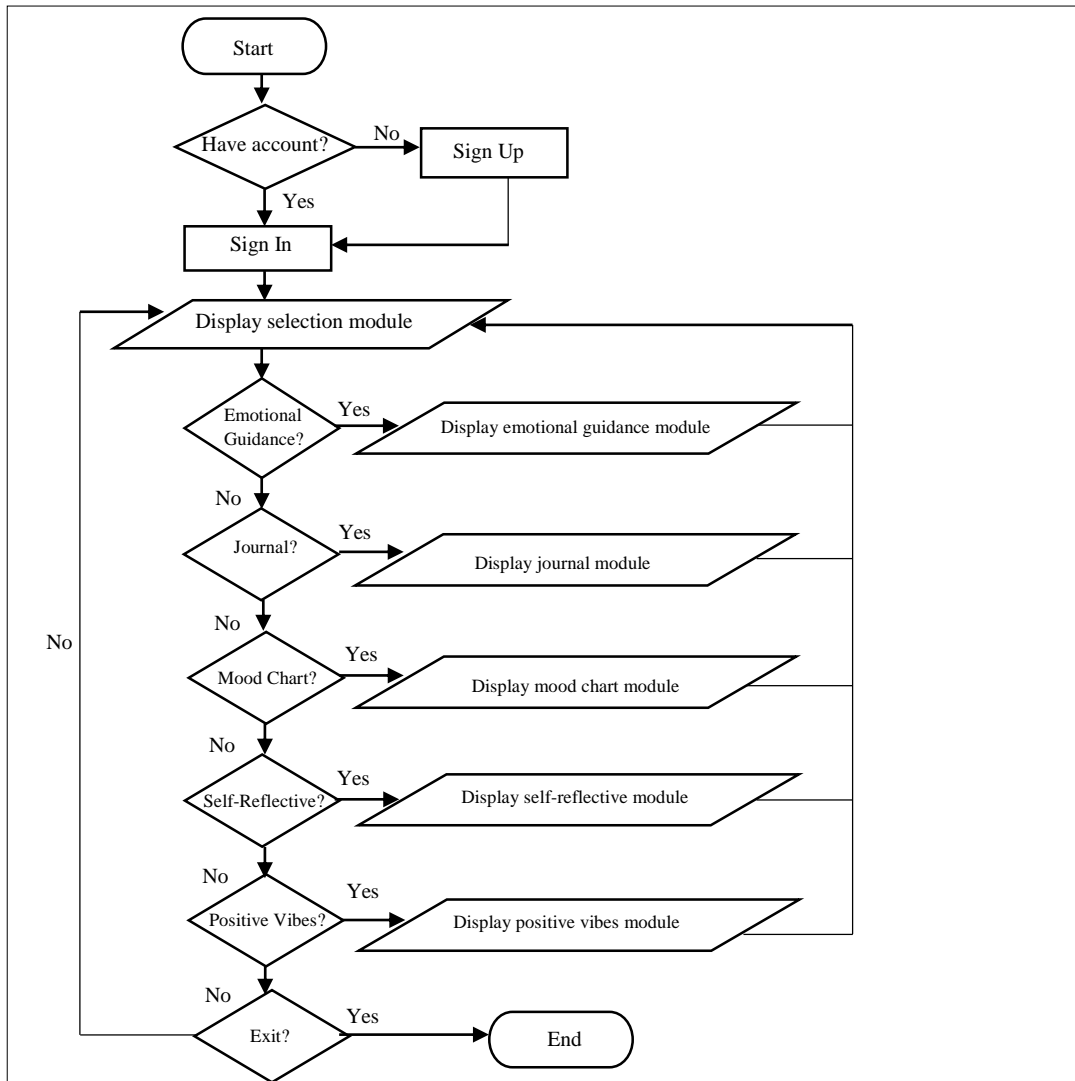
Figure 6: System Flowchart

Table 4: Functional Requirements

Functional Requirements	Description
Autonomous System Activities	- After the user signs up for the account with a username, email, and password, the main interface shall display a sign-in interface to enable the user to sign in automatically. - After the user presses the timer button, the time shall automatically start counting and pausing. - The mood chart module shall generate the mood chart based on the mood selected in the journal module by the users automatically. - The application shall store and display all the data of the module.
User Interaction Support	- The application should allow users able to sign in if the username and password are correct. - The application should allow users to switch between different modules.

Functional Requirements	Description
	• The application should allow users to register successfully if following the required input format.
User Interaction Support	• The application shall allow users to switch the mood chart by weekly and monthly tabs. • The application shall allow the users to play video and music when the user clicks the "Play" icon button.

Table 5: Non-Functional Requirements

Non-Functional Requirements	Description
Performance	• The application shall operate completely either online or offline. • The application shall respond to every process within 2 seconds for all users. • The login process should successfully load within 5 seconds.
Usability	• User shall learn quickly as it applies a simple user interface design. • The design of the application should make user-pleasant to use.
Cultural	• The language used for this application is English which is understandable by all Malaysian. • The application shall use a familiar metaphor such as an icon or text that is understandable by all Malaysian.
Legal	• User cannot modify the content of the application.

3.3 Design the Process

Designing the process is the third phase of the MMCD approach. Design objects and writing the single function prototype script are two subphases in this stage. The interface and button design for the modules were completed at the end of this process as shown in Table 6 and Table 7. The database of the application was designed in this stage using Google Firebase and Google Firestore to store the authentication and file data as shown in Figure 7. A single prototype function script was designed, such as the navigation function between the buttons, as shown in Figure 8. In this project, authoring tools such as Adobe Photoshop, Microsoft PowerPoint, and Canva were used to create 2D graphics and interface design. Meanwhile, Android Studio was used to compile the assets with scripting, as shown in Figure 9.

Table 6: Button Design

Button	Description	Button	Description
NEXT	This is the next button.		This is the exit button.
GET STARTED	This is the get started button.		This is the timer button.
LOGIN	This is the login button.		This is the home button.
SIGN UP	This is the sign-up button.		This is the dashboard button.
YES	This is the exit yes button.	<	This is the previous/ back button.
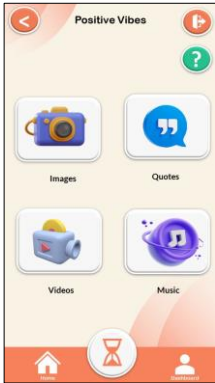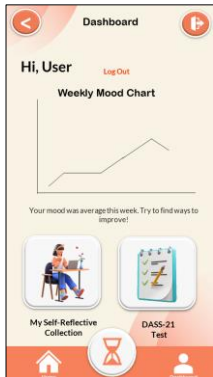
Button	Description	Button	Description
NO	This is the exit no button.	+	This is adding button.
✓	This is the save button.	✓	This is the close button.
>	This is the next button.	?	This is more description button

Table 7: Interface Design

Interfaces	Description	Interfaces	Description
	This is the welcome interface of the proposed application. The user clicks the get started button to go to the sign-in interface.		This is the mood chart interface that will record the weekly and monthly mood patterns.
	This is the sign-in interface for the users who have an account while the sign-up interface allows users to register an account.		This is the main menu interface that contains emotional guidance module, journal module, mood chart module, self-reflective module and positive vibes module.
	This is the self-reflective interface. It shows the reflective question and allows users to write down their thoughts.		This is the positive vibes interface. It allows users to choose relaxing images, videos, positive quotes, and relaxing music.

9

Interfaces	Description	Interfaces	Description
	This is the mood selection interface and the journal interface. The users can select the moods.		This is the dashboard interface that will show the weekly mood chart with conclusion, self-reflective collection and DASS-21 test.
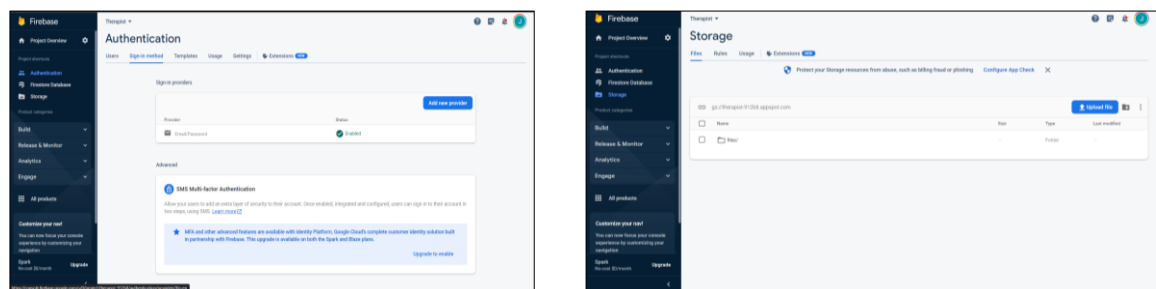
Figure 7: Database Design

```
Expanded(
            flex: 2,
            child: GestureDetector(
             onTap: () {
                Navigator.push(
                 (context),
                 MaterialPageRoute(
                    builder: (context) =>
                        const
MainPage(pageIndex: 4)),
                );
             },
```

```
 assets:
   - lib/assets/
   - videos/

flutter_launcher_icons:
 android: "launcher_icon"
 ios: true
 image_path: "lib/assets/therapistapplogo.png"
 background_color: "#FFFFF"
 min_sdk_android: 21 # android min sdk min:16,
default 21
```

Figure 8: Single Prototype Function Script   **Figure 9: Script to Compile Assets**

3.4   Develop Main Function

The main functions of the proposed application are developed in this phase. It involved developing assets for the application and the integration of the assets into Flutter. There are 3 types of multimedia elements developed as assets of the application. It consists of videos, graphics and audio as tabulated in Table 8. The integration function of the application kept getting updated throughout the development stage until all the functions were integrated perfectly.

Table 8: Application Assets Development

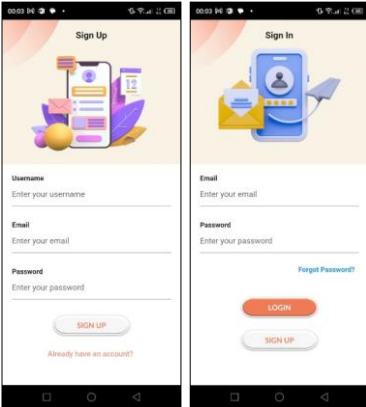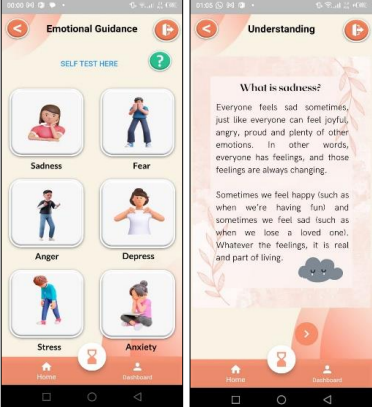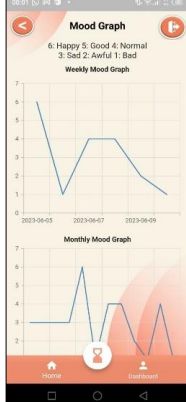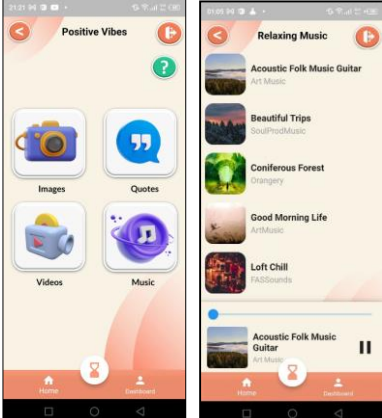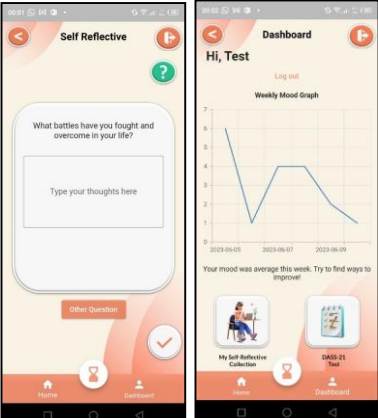| Assets	Development	Description
Videos		The videos used in the applications are downloaded from YouTube and modified later by using Adobe Premier Pro to adjust the thumbnail of the videos so that the users can directly choose the mediation video they want by viewing the thumbnail title in the module. The edited videos will then save in Moving Picture Experts Group-version 4 (MP4) format.
Graphics		Most of the graphics applied in Therapist are edited and created by using Canva to suit the proposed application well. The elements of the graphic and the template of the graphic are chosen from the Canva and the customized text are integrated into the graphic. The graphics will then be downloaded and saved in Portable Network Graphics (PNG) format.
Audio		Most of the audio applied in Therapist are obtained from online website that offer free audio resources, which are pixalbay and saved as Moving Picture Experts Group Layer-3 Audio (MP3) format.

Furthermore, the Dart scripts are developed to enable the main functions of the application. Such functions include implementing video player, database storing, photo picking function, mood chart renderer and interaction method with Firebase and Firestore. These functions are explained in Table 9. Meanwhile, the interfaces of the developed application are presented in Table 10.

Table 9: Flutter Framework with Dart

Functions	Dart Script	Description

Video Player (In Positive Vibes Module)	<pre>class _VideosListState extends State <VideosList> {
	late ChewieController videosController;
	@override
	Void initState () {
	    Super.initState();
	videosController = ChewieController(
	    videoPlayerController: widget.videoPlayerController,
	    aspectRatio: 16/9,
	    autoInitialize: true,
	    looping: widget.looping,
	    errorBuilder: (context, errorMessage) {
	        return Center(child: progressBar()
	        ); //Center
	        }
	                ); //ChewieController
	}</pre>
		The videos are added into the assets are integrated by using specific code function. The videosController is responsible for managing video playback in meditation video module. It is configured with a videoPlayerController passed in from the widget's properties, an aspect ratio of 16:9, automatic initialization, looping behavior, and an error builder that displays a progress bar when an error occurs during video playback.

Database Storing (In Sign Up Module)	<pre>onPressed: () async {
	if (usernameTextEditController.text.isNotEmpty &&
	emailTextEditController.text.isNotEmpty &&
	passwordTextEditController.text.isNotEmpty)
	{String? Result = await FirebaseAuthService.register
	(context, usernameTextEditController.text,
	emailTextEditController.text,
	passwordTextEditController.text,</pre>
		In this script, it shows part of the code segment for the database storing of the Signup interface. If all the text fields have non-empty values, it calls a static method register from the FirebaseAuthService class and awaits its result. The register method is responsible for registering a user with the provided username, email, and password to firebase.

Photo Picking Function (In Journal Module)	<pre>Future <void> _pickPhoto () async {
	    XFile? pickedFile = await ImagePicker
	().pickImage (source: ImageSource.gallery);
	    print (pickedFile? path);
	    if(pickedFile !=null) {
	        final file = File(pickedFile.path);
	        setState (() {
	            selectedPhoto = file;
	        });}}</pre>
		In this script, it shows the pick photo function in journal module. The _pickPhoto() function is an asynchronous function that allows the user to pick a photo from the gallery. ImagePicker().pickImage method is used to open the gallery and let the user select an image. Overall, this function enables the user to pick a photo from the gallery, retrieves the selected file path, and updates the widget's state with the selected photo file in the journal.

Functions	Dart Script	Description
| Mood Chart Render (In Mood Chart Module) | ```dart
List <MoodData> renderWeeklyGraph () {

    List<MoodData> moodData = [];

    DateTime currentDay = DateTime.now ();

    DateTime weekDateTime = currentDay.substact (Duration (days: currentDay.weekday -1));

    DateTime startTime = DateTime (weekDateTime.year, weekDateTime.month, weekDateTime.day);

    DateTime endTime = currentDay.add(Duration(days: DateTime.daysPerWeek – currentDay.weekday));
``` | This script shows the method named renderWeeklyGraph that returns a list of MoodData objects. This method calculates the weekly mood data based on a list of JournalDetail objects and the current date. currentDay is set to the current date and time using DateTime.now(). weekDateTime is calculated by subtracting the number of days corresponding to the current day of the week minus 1 from currentDay. |
| Interaction Method with Firebase and Firestore (In Journal Module) | ```dart
static Future <JournalDetail> recordEvent (JournalDetail journalDetail) async {
    DocumentReference <Map < String, dynamic>> documentReference = await FirebaseFireStore.instance.collection (userID).doc('journal').collection(userID).add ({
 'date': journalDetail.date,'event': journalDetail.event,
'mood': journalDetail.mood,
'text': journalDetail.text,
'photoUrl': journalDetail.photoUrl,
});
journaDetail.id = documentReference.id;
return journalDetail;
}
static Future <void> updateEvent (JournalDetail journalDetail) async
{
await
FirebaseFireStore.instance.collection(userID).doc('journal').collection(userID).doc(journalDetail.id).update({
    'date': journalDetail.date,, 'event': journalDetail.event,, 'mood': journalDetail.mood, 'text': journalDetail.text, 'photoUrl': journalDetail.photoUrl,});
}}
``` | In this script, it shows the interaction method with Firebase and Firestore. recordEvent and updateEvent are the methods that are used to interact with Firebase and Firestore to record and update journal events such as journal date, journal text, mood selection and uploaded photo. |

Table 10: Interfaces of the Developed Application

Module	Interfaces	Module	Interfaces
Welcome Interface		Main Interface	
Login and Sign-Up Module		Emotional Guidance Module	
Journal Module		Mood Chart Module	
Positive Vibes Module		Self-Reflective Module and Dashboard	

3.5   Testing

There are three types of testing that have been performed which are functional testing, user acceptance level and functionality test and System Usability Scale (SUS) testing. The main purpose of the testing stage is to measure the functionality and usability of the application towards the target users and to make sure the objective of this application is achieved. The integration function of the application kept getting after the testing process to improve the application.

The user acceptance level and functionality test and System Usability Scale (SUS) testing aims to get feedback from the target user based on their experience in using the Therapist and uncover as many bugs or usability issues as possible before publishing the application. The target users are university students from public and private university. The testing was conducted through Google Form questionnaire to answer. A total number of 30 respondents are involved in the user acceptance level and functionality test and 12 of respondents are involved in System Usability Scale (SUS) testing.

4.   Results and Discussion

This section presents data and analysis of functional testing, functionality and user acceptance testing and System Usability Testing (SUS). The functional testing is presented in Table 11.

Table 11: Functional Testing

Test	Expected Result	Actual Result	Corrective Action
Navigation Button	Able to navigate to every module selected	Works well as expected	Not needed
Close Button	Able to close the pop-up dialog		
Exit Button	Show exit dialog when tapped		
Description Button	Able to show the module description		
Text input field	Able to type the text		
Play button	Able to play the video and audio		
Pause button	Able to pause the video and audio		
Full Screen Button	Able to control full screen of the video		
Save Button	Able to save the journal details and self-reflective question and answer	Unable to save the journal details	Setup Google Firebase to store the journal details
Upload Button	Able to upload the photo	Unable to select the image from device	Recorrect the scripts to make sure that the photo can be selected from device

Table 11 shows that a few errors were spotted. In the journal and self-reflective module, it was unable to save the journal details and self-reflective question and answer when tapping the save button. In the journal module, it was unable to upload the photo from the device gallery when tapping the upload button. To solve these problems, the Google Firebase needed to be setup and checked all the procedures have linked properly to store the journal details successfully. For the upload problems, the scripts are corrected to make sure the photo can be selected from the device.

The questionnaires consist of two sections which focus on user acceptance level and functionality of the application. User acceptance level depends on the satisfaction of the user after testing the application. The questions set on user acceptance level are based on ease of use, suitability, user interface design, and knowledge gain from using the application. On the other hand, the questions for the application's functionality mainly focus on each module.

Question 1: I think THERAPIST mobile application is easy to use.
Question 2: I like the user interface design in THERAPIST application.
Question 3: I think THERAPIST mobile application is useful for identifying the mood patterns in mood chart.
Question 4: I am able to gain knowledge by using THERAPIST mobile application with a well-organized and proper emotional guidance.
Question 5: I know where to access the features that I want with clear instruction in THERAPIST mobile application.

Figure 10: Analysis of User Acceptance Level

As shown in Figure 8, there are five questions to determine the user acceptance level. From the chart generated, more than 80% of respondents agree with the question asked about the application. For Question 1, 93.4% of respondents think that the Therapist application is easy to use, while only 6.70% of respondents are neutral. For Question 2, all respondents liked the user interface design in the Therapist application. For Question 3, 83.7% of respondent thinks that the Therapist application is useful for identifying the mood patterns in mood chart. 16.70% of respondents are neutral. For Question 4, 93.3% of respondents think they are able to gain knowledge by using Therapist mobile application with a well-organized and proper emotional guidance while 16.70% of respondents are neutral. Finally, for Question 5, 90% of users know where to access the Therapist application features with clear instruction. Only 6.70% of respondents are neutral and 3.30% of users disagree. As a result, most of the respondents provided positive feedback in the user acceptance testing.
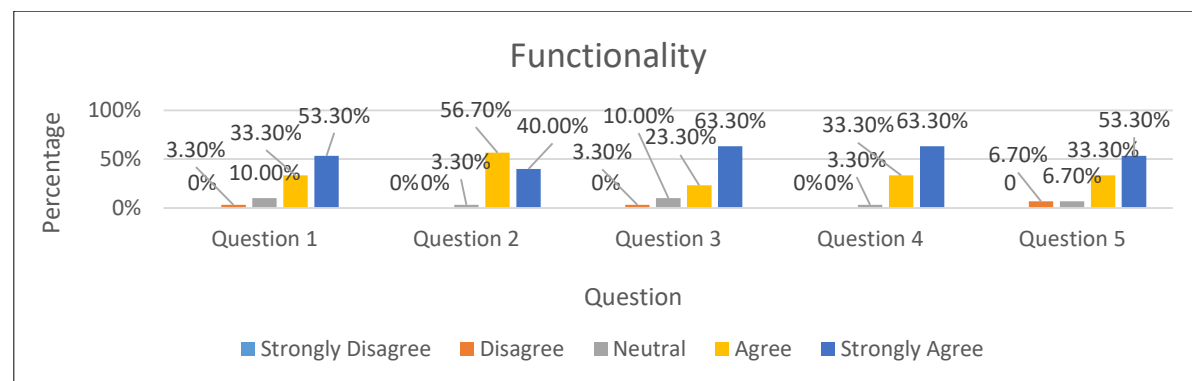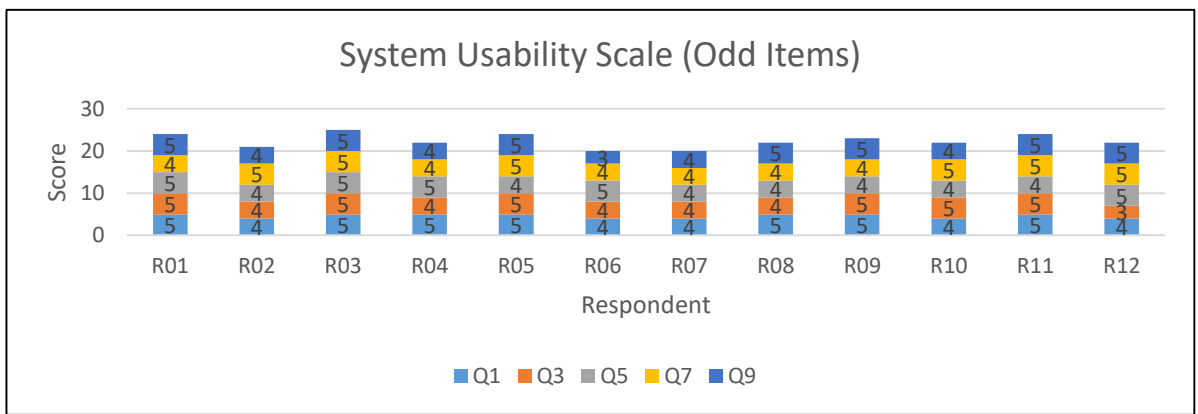

Figure 11: Analysis of Functionality

Question 1: In emotional guidance module interface, I can select the guidance I want and view the content.
Question 2: In journal module interface, I can select my mood, write journal in text, upload photo and save the data successfully on specific date selected.
Question 3: In mood chart module interface, I can view my average mood patterns in weekly and monthly.
Question 4: In self-reflective module interface, I can type in the text field and save the text data successfully.
Question 5: In positive vibes module interface, I can play the videos and music smoothly and also able to get full screen for the images and videos.
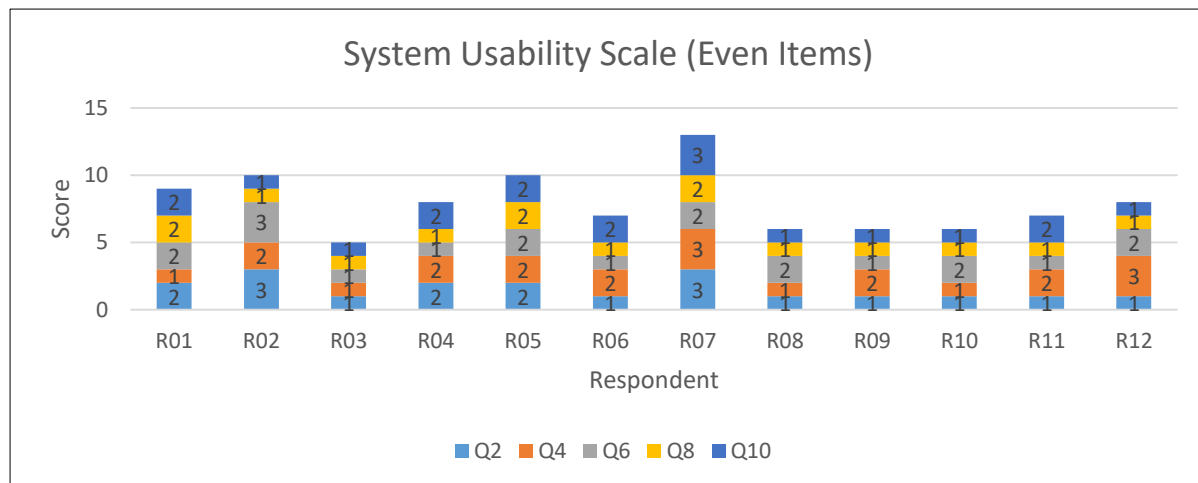
Figure 11: (cont)

Based on Figure 9, there are five questions to determine the functionality of the application from the users. For Question 1, a total of 86.6% of respondents can select the guidance they want and view the content in emotional guidance module. There are 10% of respondents are neutral and only 3.30% of respondents disagree. For Question 2, a total of 96.7% of respondents can select their mood, write journal in text, upload photo and save the data successfully on specific date selected in journal module. Only 3.30% of respondents are neutral. For Question 3, a total of 86.6% of respondents able to view my average mood patterns in weekly and monthly in mood chart module, while only 10% of respondents are neutral and 3.30% are disagree. For Question 4, 96.6% of respondents are able to type in the text field and save the text data successfully in self-reflective module and only 3.30% of respondents are neutral. Finally, for Question 5, 86.6% of respondents are able to play the videos and music smoothly and also able to get full screen for the images and videos in positive vibes module. Meanwhile, 6.70% of respondents are neutral and disagree. Thus, the results show that the functionality of Therapist is in the optimum stages.

Question 1: I think that I would like to use this application frequently.
Question 3: I thought the application was easy to use.
Question 5: I found the various functions in this application were well integrated.
Question 7: I would image that most people would learn to use this application very quickly.
Question 9: I felt very confident using this application.

Figure 12: Analysis of Positive Questions

Based on Figure 10, basically all respondents gave 4 marks and above, which agrees to the positive statement in questionnaires. Although some of the questions obtained 3 marks which is neutral but none of them disagree with the positive outcome.

Question 2: I found the application unnecessarily complex.
Question 4: I think that I would need the support of a technical person to be able to use this application.
Question 6: I thought there was too much inconsistency in this application.
Question 8: I found the system very cumbersome to use.
Question 10: I needed to learn a lot of things before I could get going with this system.

Figure 13: Analysis of Negative Questions

Based on Figure 11, almost all the respondents gave marks in between 1 to 3, which disagrees with the negative statement in questionnaires. The overall result shows that most respondents do not have much problem using the Therapist application.

Figure 14: System Usability Scale (SUS) [14]

The total scores for each question from the user tests were obtained by calculating the average score by using the formula based on System Usability Scale (SUS) [14]. The average score of the usability value is 86.25 which is in the range of acceptable in the score scale. Overall, the built-in applications can be classified as successfully meeting the needs of the target users.

5.   Conclusion

In conclusion, the Therapist application was successfully developed with five main modules, namely Emotional Guidance, Journal, Mood Chart, Self-Reflective and Positive Vibes.

All three objectives set from the beginning of the project have been achieved. The three objectives of this project were fully accomplished by designing the Therapist mobile application based on DASS-21 inventory model. To achieve this goal, the design phase consists of navigational structure, flowchart, storyboard, database design, interface design and button design. Second, successfully developing an

android platform that provides emotional control guidance, mood charts and self-journal for university students. To achieve this objective, many platforms of learning the Android app development have been gone through to make sure the Therapist application can be successfully developed all the required module and fully functional based on the requirement. Lastly, performing the functional and user acceptance testing after the development phase was completed. The usability testing obtained the SUS score of 86.25% which is within the acceptable range based on the System Usability Scale (SUS). The grade scale is B and the adjective rating is excellent.

Therapist application has several advantages, such as the content has been verified by deputy head officer of Universiti Tun Hussein Onn Malaysia Counselling Centre as the Subject Matter Expert. Therefore, the application has the ability to provide mental support for university students. Besides, the application is able to provide the same knowledge as Kementerian Kesihatan Malaysia (KKM) because the emotional guidance information has referred from the actual Kementerian Kesihatan Malaysia (KKM) official portal website.

Therapist application also provided the mood chart recorder to help students to know and identify their mood patterns and provided the DASS-21 test to help the students to carry out their mental health test in the application. Apart from its advantages, the Therapist application has a number of flaws that were discovered during user testing. Hence, for future work, it is suggested that the mood chart can be more detailed in the mood chart module. Besides, provides more different types of emotion guidance in emotional guidance module and provides a greater number of relaxing videos and relaxing music in positive vibes module. Additionally, allow users to upload more photos in journal module.

Acknowledgment

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