



Faculty of Computer Science and Information Technology

***MyMindaHub: A Web App for Mental Health Education and Early
Intervention for Year 5 Primary Students***

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Bachelor of Software Engineering with Honours

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DECLARATION

I hereby declare that this Final Year Project report, entitled MyMindaHub: A Web App for Mental Health Education and Early Intervention for Year 5 Primary Students, is the result of my own work and effort. It has not been submitted previously, in whole or in part, for the award of any degree or diploma at this or any other institution.

All sources of information used and data obtained in the preparation of this project have been acknowledged accordingly through proper referencing. This work is a true reflection of my personal understanding, contributions, and findings based on the research and development carried out.

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.....

23rd June 2025

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82200

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LIST OF ABBREVIATIONS

FSCIT – Faculty of Computer Science and Information Technology

UNIMAS – University Malaysia Sarawak

WHO – World Health Organization

UI – User Interface

DFD – Data Flow Diagram

ERD – Entity Relationship Diagram

PK – Primary Key

FK – Foreign Key

ABSTRACT

Mental health issues such as anxiety, depression, and stress are increasingly prevalent among children and adolescents, with studies indicating that a significant number of young individuals experience diagnosable or subclinical mental health disorders. Despite the importance of early intervention and education, mental health topics remain underrepresented in primary school curricula. To address this gap, MyMindaHub is a web app that provides Year 5 primary students with a fun platform for learning about mental health. The app includes educational modules on key mental health topics, quizzes to reinforce learning, and a self-assessment tool that supports early detection of mental health concerns. With its child-friendly interface and interesting content, MyMindaHub fosters a supportive environment where students better understand their emotions, practice self-care, and recognize when to seek help. Additionally, the platform also acts as a valuable resource for educators, parents, and counselors, enabling the introduction and discussion of mental health in an accessible and relatable way. By promoting early mental health literacy and reducing stigma, MyMindaHub empowers students to prioritize their well-being. Its scalable design supports future expansion to additional topics and grade levels, contributing to the broader goal of improving mental health awareness in primary schools.

ABSTRAK

Isu kesihatan mental seperti kebimbangan, kemurungan, dan tekanan semakin berleluasa dalam kalangan kanak-kanak dan remaja, dengan kajian menunjukkan bahawa sebilangan besar individu muda mengalami gangguan kesihatan mental yang boleh didiagnosis atau subklinikal. Walaupun intervensi awal dan pendidikan sangat penting, topik kesihatan mental masih kurang diberi penekanan dalam kurikulum sekolah rendah. Untuk mengatasi jurang ini, MyMindaHub ialah sebuah aplikasi web yang menyediakan pelajar Tahun 5 dengan platform yang menarik dan interaktif untuk mempelajari tentang kesihatan mental. Aplikasi ini merangkumi modul pendidikan yang meliputi topik utama kesihatan mental, kuiz untuk mengukuhkan pembelajaran, dan alat penilaian sendiri bagi menyokong pengesanan awal isu kesihatan mental. Dengan antara muka mesra kanak-kanak dan kandungan interaktif, MyMindaHub mewujudkan persekitaran yang menyokong di mana pelajar dapat memahami emosi mereka dengan lebih baik, mengamalkan penjagaan diri, dan mengenal pasti masa yang sesuai untuk mendapatkan bantuan. Platform ini turut berfungsi sebagai sumber yang berguna untuk pendidik, ibu bapa, dan kaunselor dalam memperkenalkan dan membincangkan topik kesihatan mental secara mudah diakses dan relevan. Dengan memupuk literasi kesihatan mental awal dan mengurangkan stigma, MyMindaHub memperkasa pelajar untuk mengutamakan kesejahteraan diri mereka. Reka bentuknya yang boleh diskalakan menyokong pengembangan pada masa hadapan bagi merangkumi lebih banyak topik dan peringkat tahun, sekali gus menyumbang kepada matlamat yang lebih besar dalam meningkatkan kesedaran kesihatan mental di sekolah rendah.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Mental health has become an increasingly significant concern among children and adolescents, with studies highlighting the growing prevalence of mental health issues such as anxiety, depression, and stress among young individuals. Over half a million (13.6%) Australian children aged 4 to 11 suffer from a diagnosable mental health disorder annually, and many more are thought to struggle with subclinical mental health issues, according to a comprehensive nationwide survey of parents and teenagers (Johnson et al., 2018; Lawrence et al., 2015). Based on (Rampazzo ML, Massimo Mirandola M, Ruth M, Davis J, Carbone MS, Mocanu MA., 2015), an average of two to three children in every elementary school class have some form of mental health pathology, as 10% of pupils between the ages of six and eleven suffer from mental diseases.

Early intervention and education about mental health are crucial in helping children recognize emotional challenges and seek the support they need. This also can be supported by a study where it is stated that the school environment is an ideal space for early identification and intervention when mental disorders may become apparent (García Marina MC, González Prieto NI. La salud mental en la escuela. Metas Enferm, 2013). Despite its importance and prevalence, mental health education remains underrepresented and are not typically addressed as frequently in primary school curricula, with few resources available to help children understand and manage their emotions effectively (Asiel A, García-Gil MM, Namdev C, Fernández A, 2013).

MyMindaHub aims to address this gap by developing a web app that provides Year 5 primary students with a fun platform to learn about mental health. The app will feature educational

modules covering key mental health topics, quizzes to reinforce learning, and a self-assessment tool that enables early detection of mental health issues. Designed with child-friendly interfaces and interesting content, the app will foster a supportive environment where students can better understand their emotions, practice self-care, and identify when to seek help.

The platform will also support educators, parents, and counselors by offering a resource for introducing and discussing mental health topics in a way that is approachable and relatable for children. By focusing on early mental health literacy and intervention, the app will help reduce the stigma surrounding mental health and empower students to prioritize their well-being. Through its innovative use of technology and design, MyMindaHub aims to create a scalable model for mental health education that can be expanded to include additional topics and grade levels, ultimately contributing to the overall improvement of mental health awareness in primary schools.

1.2 Problem Statement

Mental health is a growing concern, not only for adults but also for children. With increasing stress levels due to academic pressures, social interactions, and technological exposure, children are facing mental health challenges at younger ages. Encouraging the mental well-being of children and adolescents is a top priority that may be attained through enacting laws and regulations that safeguard and encourage mental health, assisting parents in providing loving care, introducing school-based initiatives, and enhancing community as well as virtual spaces (World Health Organization (WHO), 2020). Programs for social and emotional learning in schools are among the best methods of promotion for nations of all financial levels (World Health Organization (WHO), 2020). Unfortunately, mental health education is often neglected in the early stages of childhood education (Kauffman, J. M., & Badar, J., (2018). There is a need for an engaging, age-

appropriate way to introduce mental health concepts to children, helping them recognize issues and know where to seek help if needed.

1.3 Scope

The scope of this project includes the design, development, and testing of a web application aimed at enhancing mental health literacy for Year 5 students. Key features comprise educational modules, activities, self-assessments, and a secure counselor dashboard for progress monitoring. The app will be piloted within a selected group of students to gather feedback and measure its effectiveness. The final product is intended as a scalable tool that can be expanded to other primary school levels and adapted for additional mental health topics.

1.4 Aim and Objectives

To create a web app that enhances mental health literacy in Year 5 students, using technology to introduce foundational mental health concepts, encourage self-awareness, early intervention tools and reduce stigma around mental health from an early age.

1. To develop an age-appropriate web app platform that introduces at least three mental health topics through fun content tailored to Year 5 primary student.
2. To implement an educational modules and quizzes to reinforce learning and encourage self-reflection.
3. To design an assessment feature called DASS-Y that can help identify students needing further support, enabling counselors to intervene early.

1.5 Methodology

The Waterfall Model, a linear and sequential development methodology, will be used for this project. It consists of (FIVE) stages: requirement, design, implementation, verification, and maintenance. Each stage must be completed before moving to the next, ensuring a systematic and process-oriented approach to software development. Further information can be seen at Chapter 3: Requirement and Analysis Design under 3.2 Methodology.

1.6 Significance of Project

The significance of this project lies in its potential to address a critical gap in early mental health education and intervention. By introducing mental health awareness at a young age, this app will empower students to recognize emotions, practice self-care, and seek help when needed, fostering a supportive environment for mental well-being.

Additionally, it will provide teachers, parents, and counselors with a resource that can easily be integrated into the classroom, creating a more holistic approach to mental health education. The project's focus on scalability ensures that it can expand to cover other topics, such as anxiety, stress management, and eventually serve as a model for mental health education across multiple grade levels. The integration of early intervention tools within the app will also support counselors in identifying students who require further attention, ultimately contributing to the reduction of mental health stigma and the promotion of healthier, well-informed communities.

1.7 Project Schedule

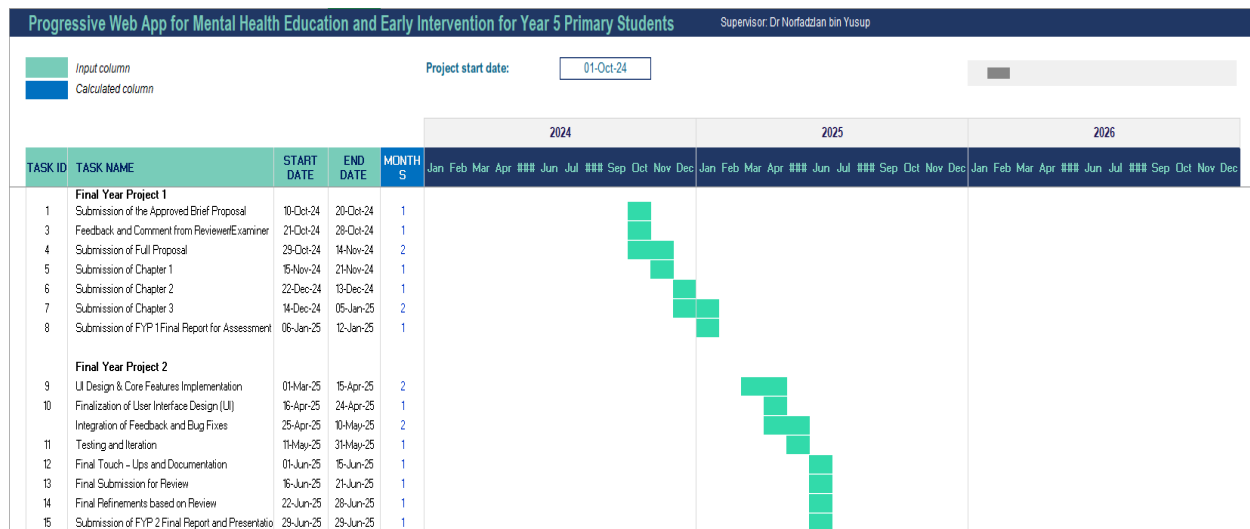
This project is split into two sections Final Year Project 1 (FYP 1) and Final Year Project 2 (FYP 2) during the course of the academic year. FYP 1 is to be finished between October 10,

2024 (Week 1) and January 12, 2025 (Week 13) while FYP 2 should be finished during semester 2. The project timeline can be seen in Table 1.1, while Figure 1.1 displays the visualization of the schedule in a gantt chart.

Table 1. 1 Project Schedule for both FYP 1 and FYP 2

Task	Start Date	Finish Date	Duration
FYP 1			
Submission of the Approved Brief Proposal	10 October 2024	20 October 2024	10 days
Feedback and Comment from Reviewer/Examiner	21 October 2024	28 October 2024	7 days
Submission of Full Proposal	29 October 2024	14 November 2024	16 days
Submission of Chapter 1	15 November 2024	21 November 2024	6 days
Submission of Chapter 2	22 November 2024	13 December 2024	21 days
Submission of Chapter 3	14 December 2024	5 January 2025	22 days
Submission of FYP 1 Final Report for Assessment	6 January 2025	12 January 2025	6 days
FYP 2			

UI Design & Core Features Implementation	1 March 2025	15 April 2025	45 days
Finalization of User Interface Design (UI)	16 April 2025	24 April 2025	8 days
Integration of Feedback and Bug Fixes	25 April 2025	10 May 2025	15 days
Testing and Iteration	11 May 2025	31 May 2025	20 days
Final Touch – Ups and Documentation	1 June 2025	15 June 2025	14 days
Final Submission for Review	16 June 2025	21 June 2025	5 days
Final Refinements based on Review	22 June 2025	28 June 2025	6 days
Submission of FYP 2 Final Report and Presentation	29 June 2025	29 June 2025	0 day



1.8 Expected Outcome

The project will result in a comprehensive web app which is MyMindaHub, that educates Year 5 primary students on foundational mental health topics through educational modules and quizzes designed to assess comprehension. The app will feature a self-assessment tool to help identify early signs of mental health concerns, allowing counselors to monitor student progress and intervene, when necessary, via a secure counselor dashboard. Additionally, the platform will serve as a valuable resource for teachers and parents, providing them with tools to introduce and discuss mental health in an approachable and engaging way. By fostering early recognition of mental health issues and encouraging help-seeking behaviors, this project aims to create a scalable model for expanding mental health education in primary schools, with the potential for further growth to include additional topics and grade levels.

1.9 Report Outline

This report provides a structured analysis of MyMindaHub, a web application aimed at enhancing mental health literacy and supporting early intervention for Year 5 primary students. Chapter 1 introduces the background, problem statement, and objectives, highlighting the need for accessible mental health resources in schools. Chapter 2 covers the literature review, examining relevant studies and existing educational tool, comparing prior initiatives in mental health literacy and emphasizing MyMindaHub's unique integration of entertaining modules and early intervention features. Chapter 3 details the design methodology, from selecting age-appropriate content to creating engaging, child-friendly features such as self-assessments and counselor dashboards. Chapter 4 presents the implementation, including development processes, technology stack, and core app functionalities designed for scalability. In Chapter 5, testing methods and evaluation metrics assess MyMindaHub effectiveness in fostering mental health awareness. Chapter 6 concludes with key findings, success evaluation, and future directions for expanding MyMindaHub to additional topics and broader educational use.

1.10 Summary

Chapter 1 introduces MyMindaHub, a web app developed to enhance mental health literacy among Year 5 students through a fun and age-appropriate content. In response to rising mental health concerns in children, MyMindaHub provides educational modules on key mental health topics, quizzes, and a self-assessment tool to promote early intervention. The chapter also explores the significance of bridging the gap in mental health literacy among the younger generations at an early age to reduce the stigma. The background, problem statement, and objectives lay the groundwork for the following chapters, which will explore the design, development, and testing of a solution aimed at enhancing mental health literacy and building a sustainable, effective educational platform for Year 5 primary students.

CHAPTER 2: BACKGROUND STUDY

2.1 Introduction

Mental health awareness and early intervention for children have become increasingly critical in contemporary educational landscapes. Digital technological solutions have emerged as promising instruments for mental health knowledge and assistance, as mental health issues among young students continue to rise. Therefore, digital mental health interventions (DMHI) can lower the costs of providing mental health care while also improving efficiency, reach, and standardization (Khanna, M. S., & Carper, M., 2022). In order to put MyMindaHub's development in context, this chapter looks at current mental health apps aimed at kids as well as people of all ages and evaluates their features, benefits, and drawbacks.

The goal of this literature review is to examine current digital mental health solutions for children, explore technological methods in mental health education, identify gaps in existing apps, and compare them to highlight how MyMindaHub can fill these gaps.

This chapter also reviews existing applications targeted to awareness of mental health issues and early childhood intervention. Aside from that, it is also to recognize on how accessible is it for children and what advantages as well as limitations do to these applications have in achieving its goals. The apps evaluated here are “Breathe, Think, Do with Sesame”, “Smiling Mind” and “Wysa”. With that, this review offers information about each app's features, benefits, and drawbacks. This comparative study will point out the features of each app that support the development of mental health awareness and pinpoint areas in which MyMindaHub hopes to provide more value.

2.2 Breathe, Think, Do with Sesame

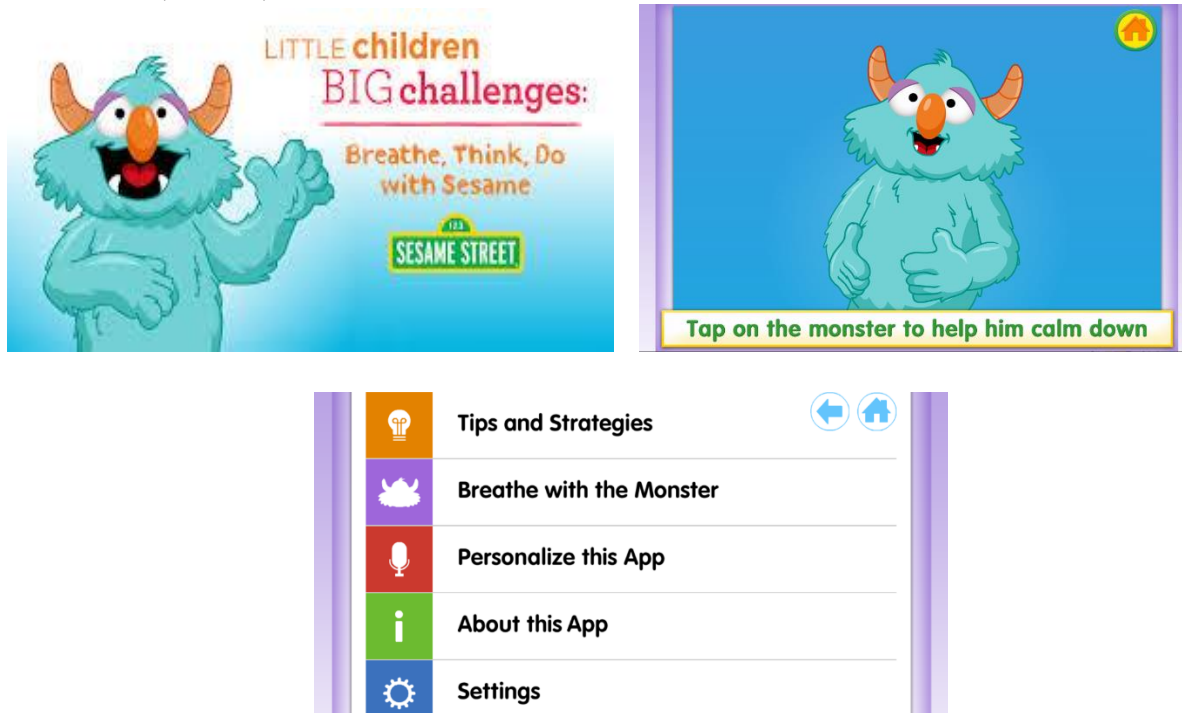


Figure 2. 1 Shows the user interface of Breathe, Think, Do with Sesame.

2.2.1 Overview

Breathe, Think, Do with Sesame is a mobile application developed by Sesame Workshop, leveraging the iconic Sesame Street characters to create an educational mental health support tool for young children (Sesame Workshop. 2023) as shown Figure 2.1. The app is grounded in developmental psychology principles, focusing on emotional intelligence and problem-solving skills for preschool and early elementary-aged children. Although frustration is a natural part of life, it can overwhelm children and trigger strong emotions.

2.2.2 Features

An overview of the main functions of the Breathe, Think, Do with Sesame app is shown in Table 2.1. The software leads kids through interactive scenarios that foster emotional development using well-known Sesame Street characters. Step-by-step problem-solving lessons, emotion awareness exercises, and guided breathing exercises are all included. Along with offering interactive mini-games for skill reinforcement and information for parents to promote their child's emotional development, the app accommodates various learning styles through visual and auditory signals.

Table 2. 1 Features Offered by Breathe, Think, Do with Sesame.

Key Features	Description
Character-driven Interactive Scenarios	Utilizes Sesame Street characters to create relatable scenarios that help children understand and navigate emotional challenges through storytelling and interactive play
Guided Breathing Technique	Provides visual and animated instructions for simple breathing exercises designed to help children calm down and manage emotional stress
Emotion Recognition Activities	Interactive games and exercises that help children identify, name, and understand different emotions through visual and auditory cues
Step-by-Step Problem-Solving Tutorials	Breaks down complex emotional situations into manageable steps, teaching children's systematic approaches to handling challenging scenarios

Parental Guidance Resources	Includes additional resources and tips for parents to support their children's emotional development and reinforce app-learned skills
Visual and Audio Cues for Emotional Learning	Incorporates engaging multimedia elements to support different learning styles and maintain children's interest
Interactive Mini-games	Provides game-based learning experiences that reinforce emotional regulation and problem-solving skills

2.2.3 Advantages/Disadvantages

The benefits and drawbacks of the Breathe, Think, Do with Sesame app are listed in Table 2.2. The app's age-appropriate content for young children, its straightforward, kid-friendly approach to emotional learning, and its captivating design utilising well-known Sesame Street characters are some of its strong points. Its drawbacks, however, are that it only targets a small age range, isn't scalable for older kids, doesn't address a wide range of mental health issues, and doesn't integrate with professional counselling services.

Table 2. 2 Advantages and Disadvantages of Breathe, Think, Do with Sesame.

Advantages	Disadvantages
Engaging design using familiar Sesame Street characters	Limited comprehensive and scope of mental health education
Developmentally appropriate for preschool and early elementary-aged children.	Narrow age range of application and limited scalability for older children
Simple and child-friendly approach to emotional learning	No professional counselor integration

2.3 Smiling Mind

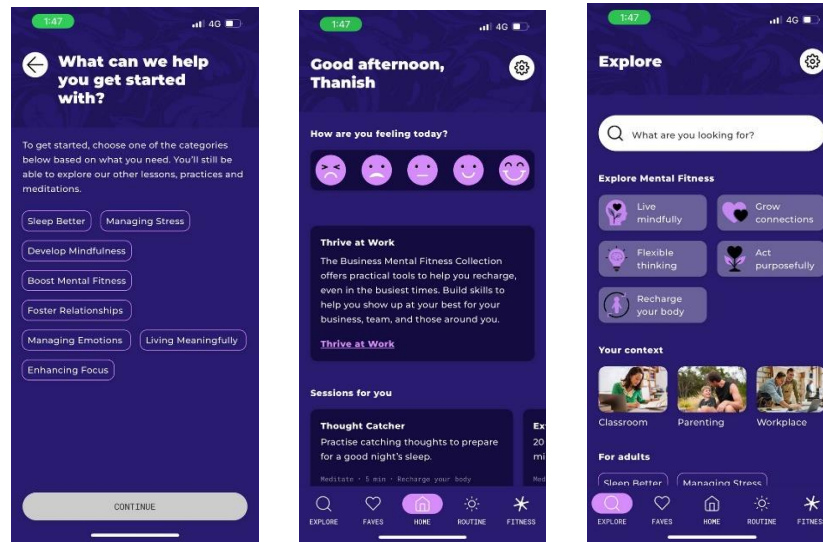


Figure 2. 2 Shows the user interface of Smiling Mind

2.3.1 Overview

Smiling Mind is a not-for-profit digital mental health platform originating in Australia, specializing in mindfulness and meditation programs for diverse age groups. The application focuses on leveraging evidence-based mindfulness techniques to support mental well-being, stress reduction, and emotional regulation across educational and personal contexts (Smiling Mind, 2024). Smiling Mind has a very simple and clean user interface, which makes it easy for users of all ages (Figure 2.2).

2.3.2 Features

Table 2.3 highlights the key features offered by the *Smiling Mind* app. The app provides age-specific mindfulness programs tailored to various developmental stages, ensuring suitable content for each user group. It includes guided meditation sessions based on scientific research, along with stress management modules aimed at improving emotional well-being. The app also supports educators through classroom-based resources, progress tracking features, and training materials, making it a valuable tool for both individual users and educational settings.

Table 2. 3 Features Offered by Smiling Mind

Key Features	Description
Age-specific mindfulness programs	Offers tailored mindfulness content specifically designed for different age groups, ensuring age-appropriate complexity and engagement
Guided and science backed meditation content and session	Develops content based on scientific research in mindfulness and mental health and provides structured, narrated meditation sessions that guide users through mindfulness techniques step-by-step
School and classroom-based resources	Develops specialized resources for educators to implement mindfulness practices within classroom settings
Progress tracking	Enables users and educators to monitor mindfulness practice consistency and personal growth
Stress Management Modules	Provides specific techniques and exercises designed to help users manage and reduce stress

Educator support materials	Offers training and support materials for educators to enhance their understanding and implementation of mindfulness techniques
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2.3.3 Advantages/Disadvantages

The advantages and disadvantages of the *Smiling Mind* app is stated in detail to better understand the strengths and weaknesses (Table 2.4). Its strengths include evidence-based mindfulness techniques, a wide range of exercises for different age groups, and strong support for educational and institutional mental health initiatives. Additionally, the app offers comprehensive resources for educators. However, it also has limitations, such as a primary focus on meditation, limited interactive learning elements, repetitive wellness check-ins, and a lack of specific tailoring for younger primary school students.

Table 2. 4 Advantages and Disadvantages of Smiling Mind

Advantages	Disadvantages
Evidence-based mindfulness techniques	Primarily focuses on mindfulness meditation
Comprehensive educational resources	Limited interactive learning components
Supports institutional mental health initiatives	Not specifically tailored to primary school students
Wide variety of exercises for all ages	Repetitive wellness check-ins

2.4 Wysa

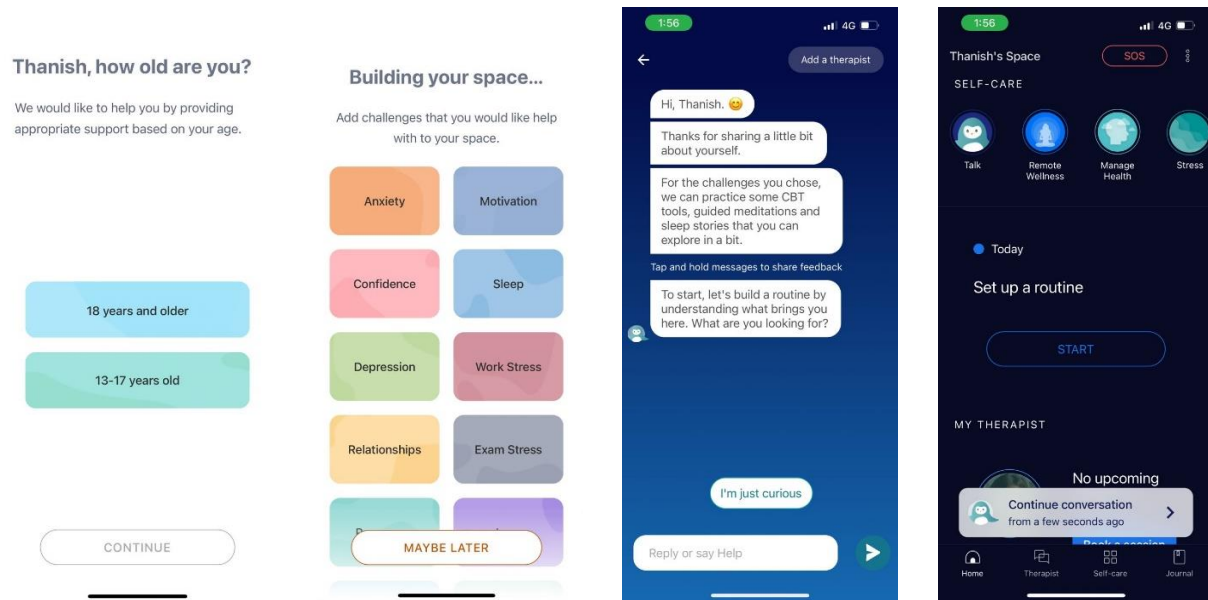


Figure 2. 3 Shows the user interface of Wysa

2.4.1 Overview

Wysa is an innovative AI-powered mental health chatbot designed to provide empathetic, accessible emotional support using advanced artificial intelligence and evidence-based psychological techniques (Wysa, 2024). Developed by mental health professionals and AI researchers, the application aims to offer supportive, adaptive conversational support for individuals experiencing emotional challenges, with a particular focus on youth and young adults (Figure 2.3).

2.4.2 Features

The characteristics of the AI-powered mental health app Wysa are listed in Table 2.5. It provides individualised emotional assistance via a conversational chatbot driven by natural language processing. The software includes interactive psychological exercises, integrates Cognitive Behavioural Therapy (CBT) methodologies, and gives round-the-clock support with adaptive dialogue that adapts to users' emotional needs.

Table 2. 5 Features Offered by Wysa

Key Features	Description
AI-driven conversational interface	Provides an interactive chatbot that uses natural language processing to engage in mental health conversations
Cognitive Behavioral Therapy techniques	Implements structured CBT approaches within conversational interactions
Personalized emotional support and adaptive dialogue	Monitors and analyzes user's emotional patterns through conversations and adapts dialogue dynamically based on individual responses and needs
24/7 accessible support	Offers continuous, immediate mental health support
Interactive Psychological Exercises	Provides engaging activities to support mental health development

2.4.3 Advantages/Disadvantages

Table 2.6 presents the advantages and disadvantages of Wysa. Key strengths include its innovative AI-based approach, around-the-clock accessibility, use of advanced psychological methods, and adaptable conversational style. However, the app is not specifically designed for children, may involve complex language that can be challenging for younger users, and includes certain premium features that require a paid subscription.

Table 2. 6 Advantages and Disadvantages of Wysa

Advantages	Disadvantages
Innovative AI-driven approach	Not child-specific
Continuous accessible support	Complex usage of language and vocabulary
Implements advanced psychological techniques	Payment for premium based on subscription
Adaptable conversation styles	

2.5 Comparison on Related Works and The Proposed System

Table 2. 7 Comparison on Related Works with Proposed System

Features	Breathe, Think, Do with Sesame	Smiling Mind	Wysa	Proposed System (MyMindaHub)
Purpose	Supports early childhood emotional development through interactive learning	Promotes mindfulness and stress reduction through structured meditation practices	Offers AI-powered conversational mental health support	Comprehensive mental health education and support for primary students
Target Audience	Preschool and early elementary children (ages 3-6)	School-aged children, adolescents, and adults	Adolescents and adults seeking immediate emotional guidance	Year 5 primary school students
Key Features	Character-driven scenarios, guided breathing exercises, emotion recognition activities	Age-specific mindfulness programs, guided meditation, progress tracking	AI chatbot with CBT techniques, emotional state tracking, 24/7 support	Interactive educational modules, self-assessment tools, counselor dashboard, age-

				appropriate content
Relevance to Mental Health	Introduces basic emotional regulation and problem-solving skills	Focuses on emotional regulation and stress management through mindfulness	Provides continuous, accessible mental health conversation and support	Provides holistic mental health literacy and early intervention support
Backed by Science	Developed with input from child development experts at Sesame Workshop	Developed by psychologists and mental health professionals, with research- backed meditation technique	Developed using evidence- based psychological techniques, AI- driven approach	Developed with input from child psychologists, educators, and mental health professionals
Advantages	Engages children through familiar characters, provides simple coping strategies	Comprehensive mindfulness training, adaptable to various	Innovative AI support, immediate accessibility,	Tailored for primary students, interactive learning,

		educational settings	judgment-free interaction	comprehensive support ecosystem
Disadvantages	Limited depth of mental health education, narrow age range	Primarily meditation-focused, limited interactive learning	Complex language, not child-specific, lacks human emotional nuance	Requires continuous content refinement, depends on effective implementation
Visual and Interface Design	Colorful, cartoon-style interface using Sesame Street characters, highly animated and playful	Clean, minimalist design with calming color schemes, simple navigation	Minimalist chatbot interface, text-based interaction with clean, modern design	Child-friendly, engaging interface with age-appropriate design, interactive elements, and supportive visual language

As shown in Table 2.7, a comparison of related works reveals the unique strengths and limitations of each existing mental health application in contrast to the proposed MyMindaHub system. Breathe, Think, Do with Sesame focuses on emotional development for younger children through character-driven scenarios but is limited in scope and age range. Smiling Mind offers structured mindfulness content supported by research, catering to a broader audience, yet it lacks interactive elements and specificity for younger users. Wysa introduces an innovative AI-powered

chatbot that delivers 24/7 mental health support using CBT techniques; however, it is not child-oriented and may involve complex language.

In comparison, MyMindaHub is purpose-built for Year 5 primary school students, integrating educational modules, self-assessment features, and a counselor dashboard. It combines elements of emotional literacy, learning, and early intervention within a user-friendly, child-appropriate interface. While the system holds promise for enhancing mental health education at the primary level, its success will depend on continuous content enhancement and proper implementation in educational environments.

2.6 Brief Overview of Proposed System

MyMindaHub is a web application specifically designed to address the critical gap in mental health education for Year 5 primary students. Unlike existing applications that focus on isolated aspects of mental health, MyMindaHub offers a comprehensive platform that combines:

1. Targeted Educational Modules: Covering crucial mental health topics
2. Fun Learning Approach: Implementing quizzes and activities that promote self-reflection and deeper understanding of mental health concepts.
3. Innovative Self-Assessment Tools: Child-friendly evaluations that help students recognize early signs of mental health challenges.
4. Comprehensive Support Ecosystem: Integrating tools for students, counselors, educators, and parents to create a holistic mental health support system.

The application distinguishes itself through its:

1. Age-specific design
2. Fun, entertaining and knowledgeable content
3. Early intervention capabilities
4. Scalability for future expansion
5. Multistakeholder approach to mental health education

Additionally, the platform will help teachers, parents, and counsellors by providing a tool for presenting and talking about mental health issues in a way that kids can understand. The app will empower students to put their well-being first and lessen the stigma associated with mental health

by emphasizing early mental health knowledge and intervention. MyMindaHub wants to promote mental health awareness in primary schools by developing a scalable model for mental health education that can be extended to cover more subjects and grade levels through its creative use of design and technology.

2.7 Summary

This chapter reviews five mental health and well-being applications which are “Breathe, Think, Do with Sesame”, “Smiling Mind” and “Wysa”. Significant shortcomings in the current methods were exposed by this chapter's careful analysis of the existing digital mental health applications available for kids. With its comprehensive, fun, and age-appropriate mental health teaching platform, MyMindaHub fills important research gaps, and the comparative analysis highlights its unique value proposition.

By creating a web app that gives year five pupils an interesting and fun platform to learn about mental health, MyMindaHub seeks to close this gap. A self-assessment tool that facilitates early mental health issue diagnosis, instructional modules covering important mental health themes, and quizzes to reinforce learning will all be included in the app. The software will provide a nurturing atmosphere where pupils can better understand their emotions, practice self-care, and recognize when to seek help thanks to its kid-friendly interfaces and engaging content.

CHAPTER 3: REQUIREMENTS ANALYSIS AND DESIGN

3.1 Introduction

This chapter outlines in detail the design of the MyMindaHub web app using the proposed technique, as well as the requirements needed from potential users to develop the project.

3.2 Methodology

In simple terms, methodology is described as a set or system of methods, precepts, principles and rules that govern a given discipline or field, such as the arts or sciences (Dictionary.com., 2025). In conjunction to that, a set of principles and guidelines used in the research, planning, design, development, testing, setup, and maintenance of software products is known as a software development methodology (Despa, M. L., 2014). Software development projects are notorious for frequently changing initial planning and specifications (Despa, M. L., 2014). That is why, the goal is to offer a systematic approach to software development (Nikolaieva, 2025).

The Waterfall Model will be methodology used in the development of this project (Figure 3.1). The waterfall model is a static paradigm that takes a sequential, linear approach to systems development, finishing one task before moving on to the next (Adenowo et al., 2013). There are FIVE (5) stages to a Waterfall Model in software development which involves requirement, design, implementation, verification and maintenance. Thus, the model endorses a method that is methodical and process-oriented.

The Waterfall Method

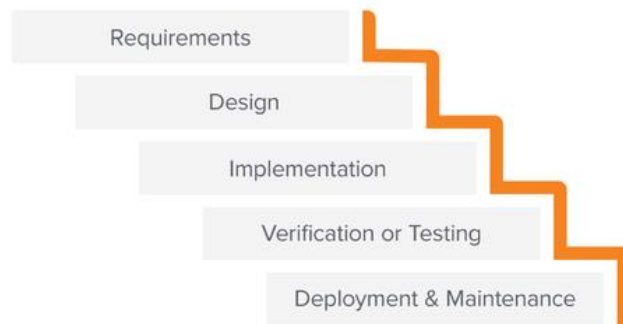


Figure 3. 1 The Waterfall Model (Adobe Communications Team, 2022)

This chapter will emphasize and address the two stages, which are the implementation and design.

3.2.1 Method for Gathering Requirements

In order to gather comprehensive requirements for this project, multiple data collection methods were employed and used to analyze systematically. In conjunction to that, this project used a mixed – methods approach which is quite commonly used among researchers to collect significant data by using both qualitative and quantitative method.

The primary methods consisted of conducting in-depth interviews with two industry professionals. One being a clinical physiologist and another being a counselling teacher. Secondly is through distributing questionnaires to Year 5 primary students at Sekolah Kebangsaan Muara Tuang. The interviews provided valuable qualitative data from experienced practitioners in the field. Complementing the expert interviews, questionnaires were also distributed to students who represent the end-users of the system. The questionnaire included closed ended questions designed to capture demographic, technology usage and accessibility, mental health understanding, app features and preferences, visual preferences and user experience providing valuable data for the study.

This dual approach also known as mixed – method of combining expert knowledge with end-user feedback ensured a well-rounded understanding of the project requirements, allowing for the development of a system that would meet both technical standards and user expectations.

3.2.2 Interview

3.2.2.1 Interview 1 with Clinical Psychologist

In discussing mental health awareness in Malaysia, the interviewee highlighted significant positive changes over the past decade. She noted that while mental health was historically stigmatized, there has been growing acceptance and recognition, particularly regarding children's mental health. The involvement of government, NGOs, and media in awareness campaigns has led to increased parental understanding and willingness to seek professional help, though challenges like stigma and limited access to mental health professionals persist in some areas.

Regarding Malaysia's education system, the interviewee emphasized how academic pressure significantly impacts students' mental well-being. She described a system heavily focused on exam results, which can cause stress, anxiety, and feelings of inadequacy. While comparing Malaysia to countries like South Korea and Singapore, she noted that Malaysia is still developing its mental health support systems within education. The interviewee stressed that academic pressure's impact varies depending on school environments and individual students' coping abilities, highlighting the importance of schools that consider students' individual needs and mental well-being.

The interviewee strongly advocated for early mental health education, suggesting it should begin as early as infancy. She explained that young children learn about emotions through their caregivers' responses, and early education helps normalize mental health discussions and reduce stigma. For Year 5 students (age 11), she recommended focusing on three key topics: Understanding Emotions, Resilience Building, and the Importance of Friendships and Peer Relationships.

When discussing common mental health challenges for primary school children, particularly those around age 11, the interviewee identified several key issues: academic pressures, identity crises, low self-esteem, social struggles, anxiety, and emotional regulation difficulties. She emphasized the importance of recognizing early warning signs, such as behavioral changes, mood shifts, concentration difficulties, unexplained physical complaints, and changes in social interactions or sleep patterns.

Regarding technology's role in mental health education, the interviewee viewed it as a complementary tool to traditional services. She suggested that digital tools can help reduce stigma, increase accessibility, provide immediate support, and enhance preventive care through screening tools and educational materials. For measuring the effectiveness of mental health education apps, she recommended tracking metrics such as usage frequency, completion rates, pre-post knowledge tests, and behavioral changes over time.

The interviewee concluded that while technology plays an important role in mental health education and support, it should serve to complement rather than replace traditional mental health services, emphasizing its value in providing accessible, engaging, and immediate support options for users.

3.2.2.2 Interview 2 with School Counselor

The counseling teacher discussed current mental health education practices in her school, explaining that they primarily deliver mental health awareness through programs like “Ujian Minda Sihat” and invited speaker sessions. She highlighted that they address sensitive topics including stress, verbal and physical bullying, family problems, friendship issues, and sexual disturbance in school settings. Notably, she observed that Year 5 students don't fully grasp the concept of stress or mental health, even though they may be experiencing it. She explained that while students feel stress, they often don't recognize it as such, and the broader concept of mental health remains difficult for them to comprehend.

Besides that, regarding student engagement with counseling services, she described it as moderate, with approximately a 50/50 split in student comfort levels. She pointed out a significant challenge which is the persistent stigma associated with visiting the counseling office, as students often fear being labeled as "problematic." However, she noted that some students are aware of and appreciate the availability of counseling support at school.

Furthermore, when discussing assessment methods, she shared that she identifies struggling students through consultations and teacher referrals, as well as by observing their expressions, actions, and even attire sometimes. She mentioned that while there's no formal assessment system in place, intervention levels are determined by the severity of each case, with serious cases requiring daily counseling sessions and involvement of the senior assistant of student affairs (Penolong Kanan Hal Ehwal Murid).

For Year 5 students specifically, she identified four crucial mental health topics: stress management, addressing sexual disturbance in school settings, bullying prevention, and handling

family problems as well as relationships. When asked about engaging this age group, she recommended fun and exciting approaches such as mini games, quizzes, and drawing activities.

Regarding the implementation of digital mental health tools, she highlighted several practical challenges such as limited internet connectivity, language comprehension issues, time constraints (with classes typically lasting 30-60 minutes), and limited access to electronic devices, as many students share devices with their parents. Aside from that, she suggested that the ideal duration for students to spend on a mental health web app would be 30-40 minutes, and emphasized the importance of including administrative features and a dashboard for counselors.

3.2.3 Questionnaire

A survey was conducted at Sekolah Kebangsaan Muara Tuang, a primary school situated at Jalan Datuk Mohammad Musa, Kampung Bukit Berangan, 94300 Kota Samarahan, Sarawak. After submitting an official faculty letter and receiving approval from the school's principal, the survey was carried out with 30 Year 5 students from diverse backgrounds.

The questionnaire aimed to gather insights on understanding the demographic, technology usage and accessibility, mental health understanding, app features and preferences, visual preferences and user experience providing valuable data for the study. Therefore, the results of this survey have been analyzed and are presented through visual representations such as charts and graphs, offering a clear and comprehensive view of the findings.

Part 1: Demographic

Question 1: How old are you?

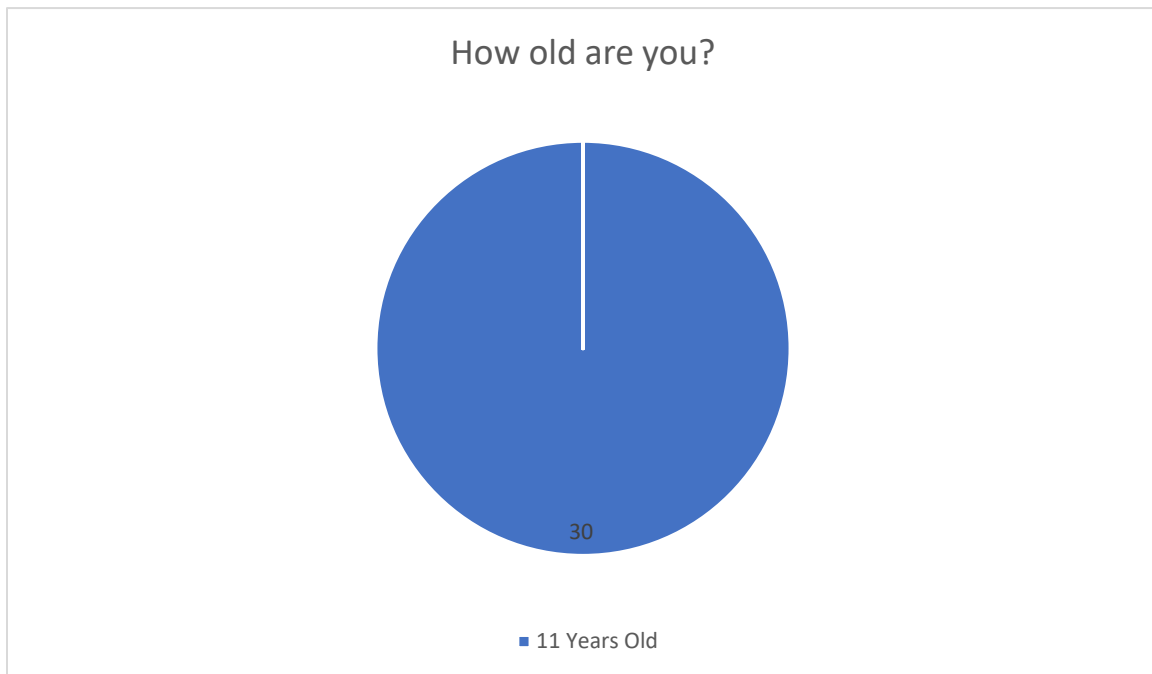


Figure 3. 2 Pie Chart of Student's Age Distribution

Based on Figure 3.2, all 30 participants (100%) are Year 5 primary students from Sekolah Kebangsaan Muara Tuang. There were no participants from any other age group. Hence, this consistency in the data reflects that the survey specifically targeted Year 5 students which ensures the responses are relevant and focused on this particular demographic.

Question 2: Gender

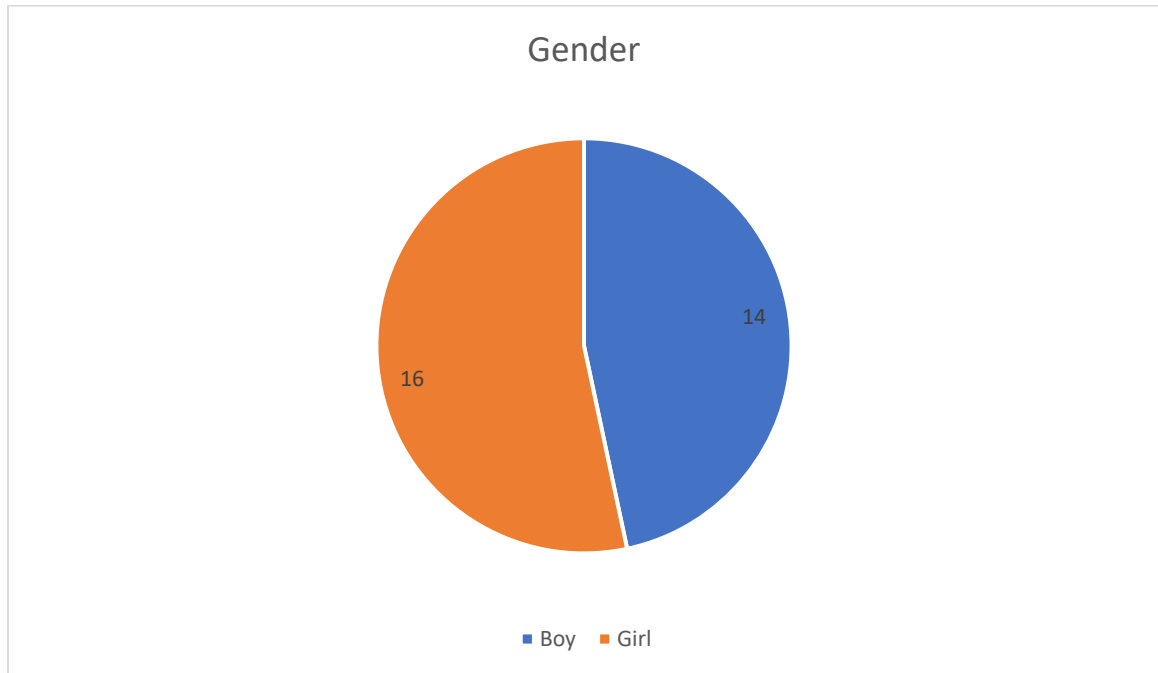


Figure 3. 3 Pie Chart of Student's Gender Distribution

Based on Figure 3.3, 14 participants are boys, and 16 participants are girls. The highest frequency is 16 (53.3%) which corresponds to the girls, while the boys have a slightly lower frequency which is 14 (46.7%). This nearly balanced gender distribution indicates a fairly even representation of boys and girls in the survey, providing a well-rounded perspective from both genders.

Question 3: Race

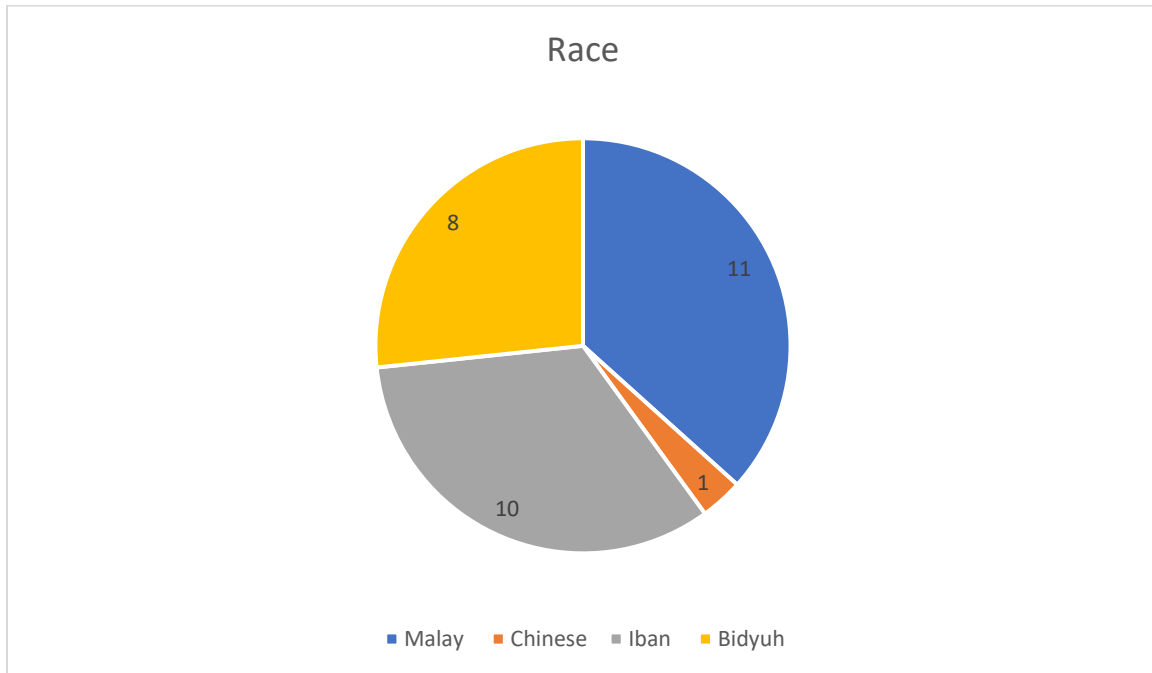


Figure 3. 4 Pie Chart of Student's Racial Composition

Based on the graph (Figure 3.4), the distribution of participants by race is as follows where 11 participants (36.7%) are Malay, 1 participant (3.3%) is Chinese, 10 participants (33.3%) are Iban, and 8 participants (26.7%) are Bidayuh. The highest frequency (36.7%) is among Malay students, followed closely by Iban students (33.3%). The lowest frequency (3.3%) is among Chinese students. Therefore, this data highlights and visibly displays a diverse representation of ethnic backgrounds, with a predominance of Malay and Iban students.

Part 2: Technology Usage and Accessibility

Question 4: Which electronic device do you use the most?

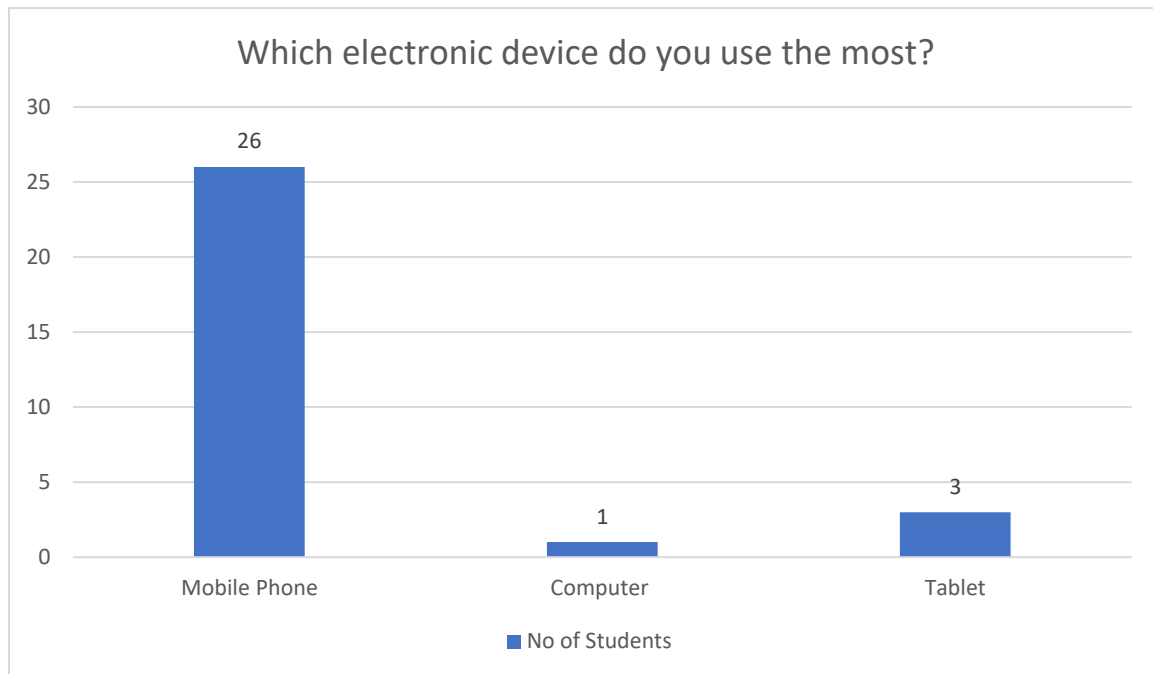


Figure 3. 5 Bar Graph of Student's Most used Electronic Devices

Based on Figure 3.5, the majority of participants primarily use a mobile phone which is 26 students (86.7%). A smaller number of participants use a tablet which is 3 students (10%), while only 1 student (3.3%) uses a computer. The highest frequency (86.7%) is for mobile phone usage, indicating that mobile phones are the most commonly used electronic device among the students. The lowest frequency (3.3%) is for computer usage, showing it is the least preferred device especially at their age in the current generation.

Question 5: How often do you use the device?

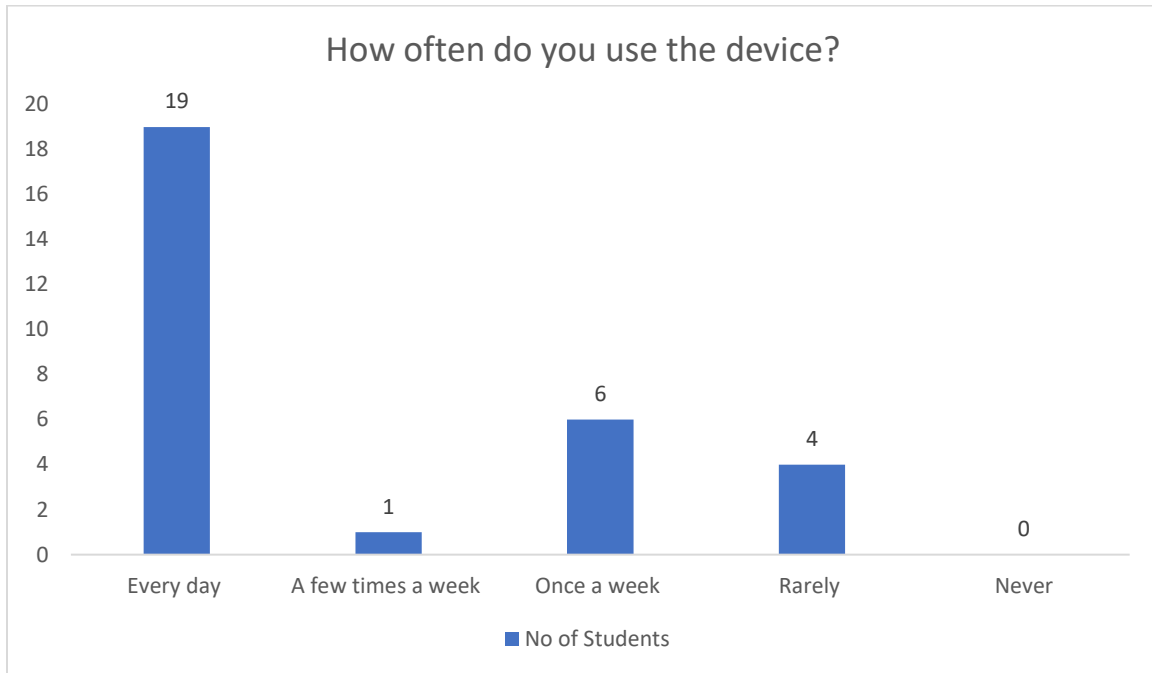


Figure 3. 6 Bar Graph of Frequency of Device Usage Among Students

Based on the graph (Figure 3.6), 19 participants (63.3%) use their device every day, 1 participant (3.3%) uses it a few times a week, 6 participants (20%) use it once a week, and 4 participants (13.3%) use it rarely. Aside from that, no participants (0%) indicated that they never use their device. The highest frequency (63.3%) is for daily usage, suggesting that most students engage with their devices regularly on a daily basis. The lowest frequency (3.3%) is for usage a few times a week, indicating this is the least common frequency among the participants.

Question 6: Where do you usually access the internet? (You can choose more than one)

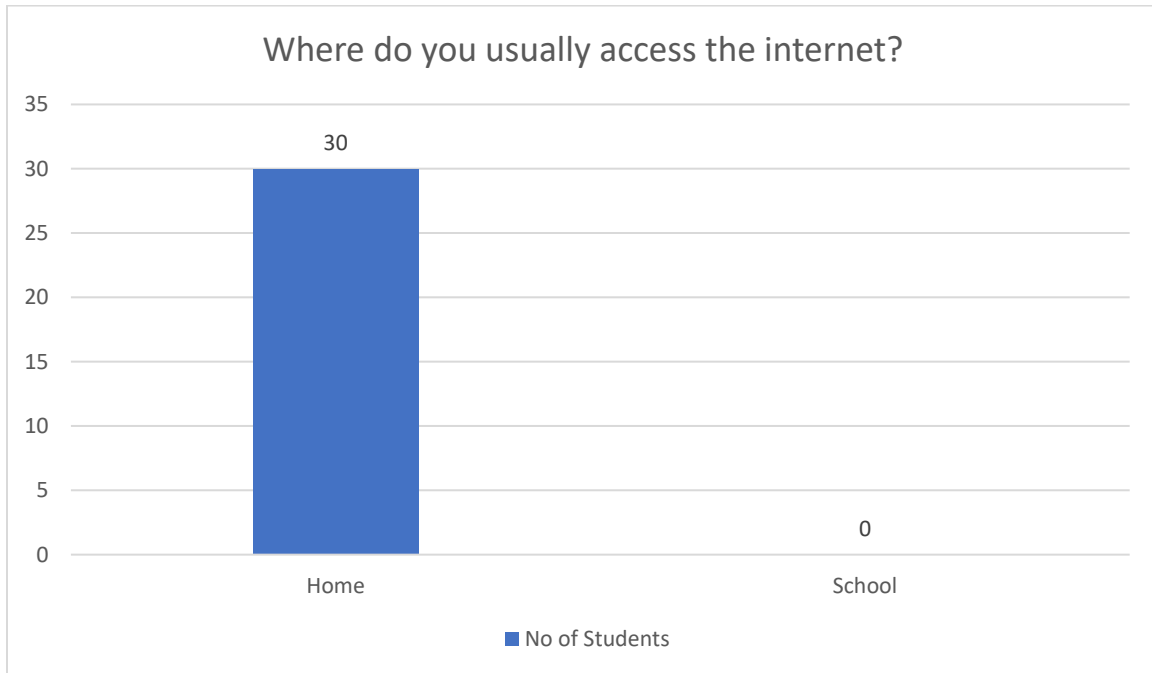


Figure 3. 7 Bar Graph of Student's Internet Access Locations

Based on Figure 3.7, all 30 participants (100%) access the internet from home, while no participants (0%) access it from school. This shows a complete reliance on home internet access for the students, with zero to none reported internet usage at school.

Part 3: Mental Health Understanding

Question 7: Have you studied about Mental Health in school?

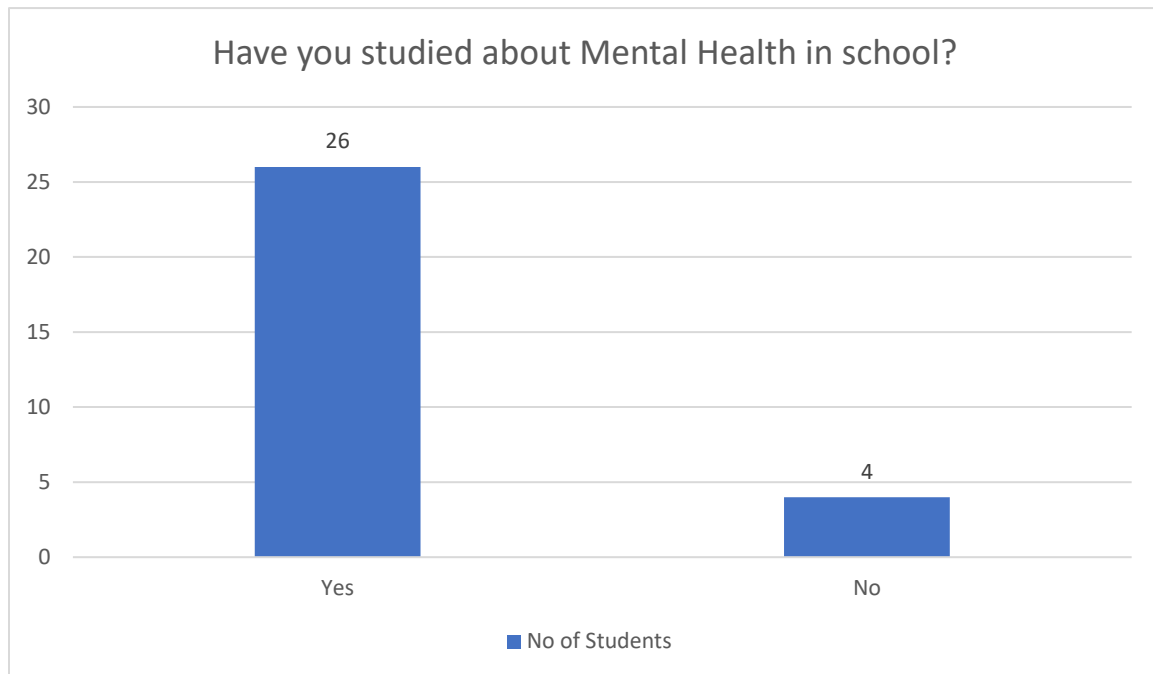


Figure 3. 8 Bar Graph of Student's Exposure to Mental Health Education

Based on Figure 3.8, 26 participants (86.7%) reported that they have studied mental health in school, while 4 participants (13.3%) said they have not. The highest frequency (86.7%) corresponds to students who have studied mental health, indicating widespread coverage in the school curriculum. The lowest frequency (13.3%) represents those who have not studied mental health, suggesting a small portion of students lack exposure to this subject.

Question 8: Has there been any Mental Health Programs done in your school?

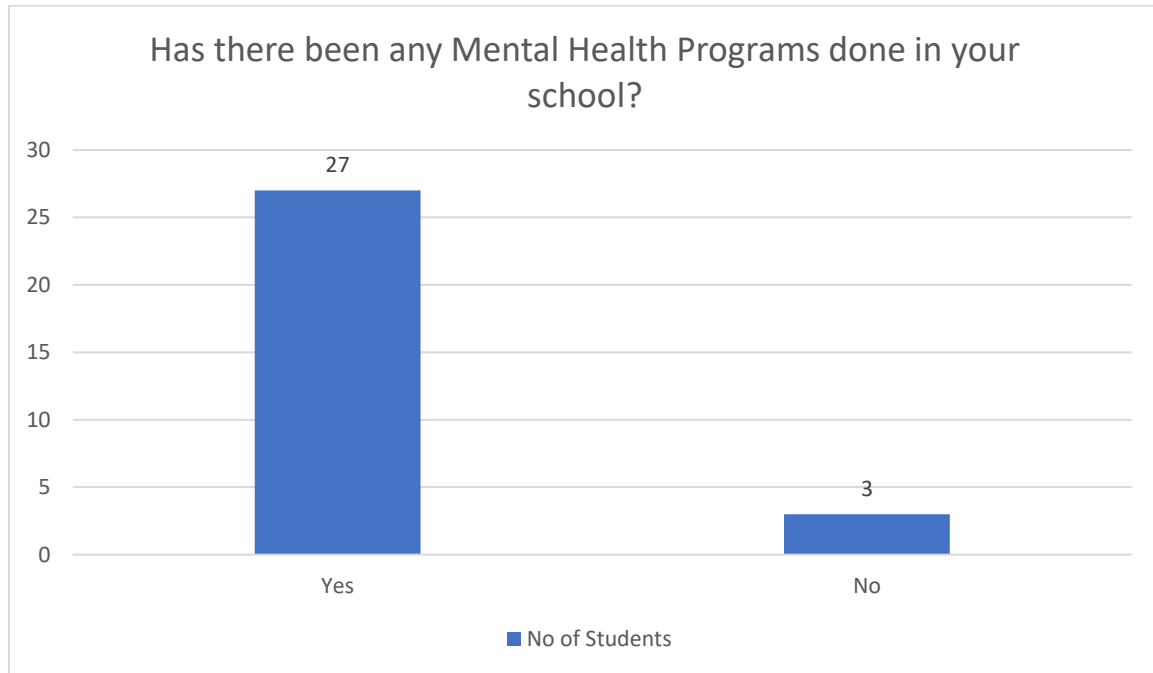


Figure 3. 9 Bar Graph of Presence of Mental Health Programs

Based on Figure 3.9, 27 participants (90%) stated that mental health programs have been conducted in their school, while 3 participants (10%) said no such programs have been conducted. The reason to the 10% could be potentially due to absentees during the mental health program day. The highest frequency (90%) reflects a strong presence of mental health initiatives in the school, whereas the lowest frequency (10%) indicates that only a small minority have not experienced these programs.

Question 9: Do you fully understand what is Mental Health?

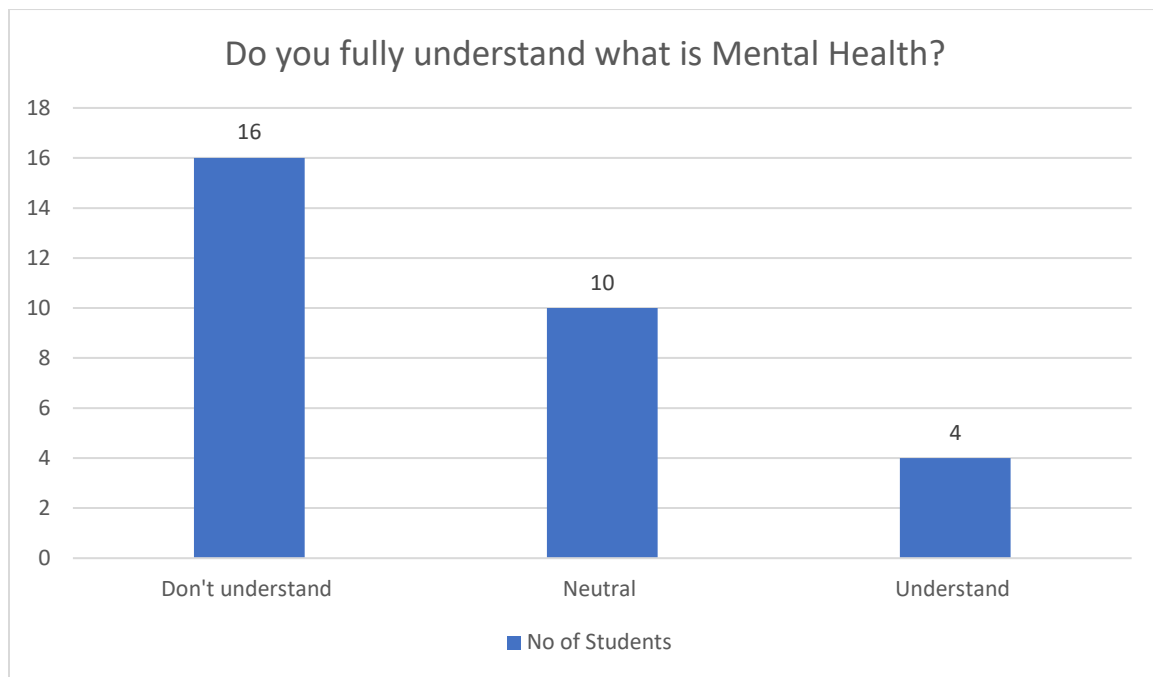


Figure 3. 10 Bar Graph of Student's Understanding of Mental Health

Based on the graph (Figure 3.10), 16 participants (53.3%) indicated they do not understand mental health, 10 participants (33.3%) were neutral, and 4 participants (13.3%) said they understand it. From here, it is clear that majority of the students in general don't completely understand the fundamentals of mental health as well as its impacts to individuals. The highest frequency (53.3%) is among those who don't understand mental health, highlighting a need for further education. The lowest frequency (13.3%) represents students who do understand, suggesting limited comprehension among the participants.

Question 10: How do you feel about talking about your feelings with others?

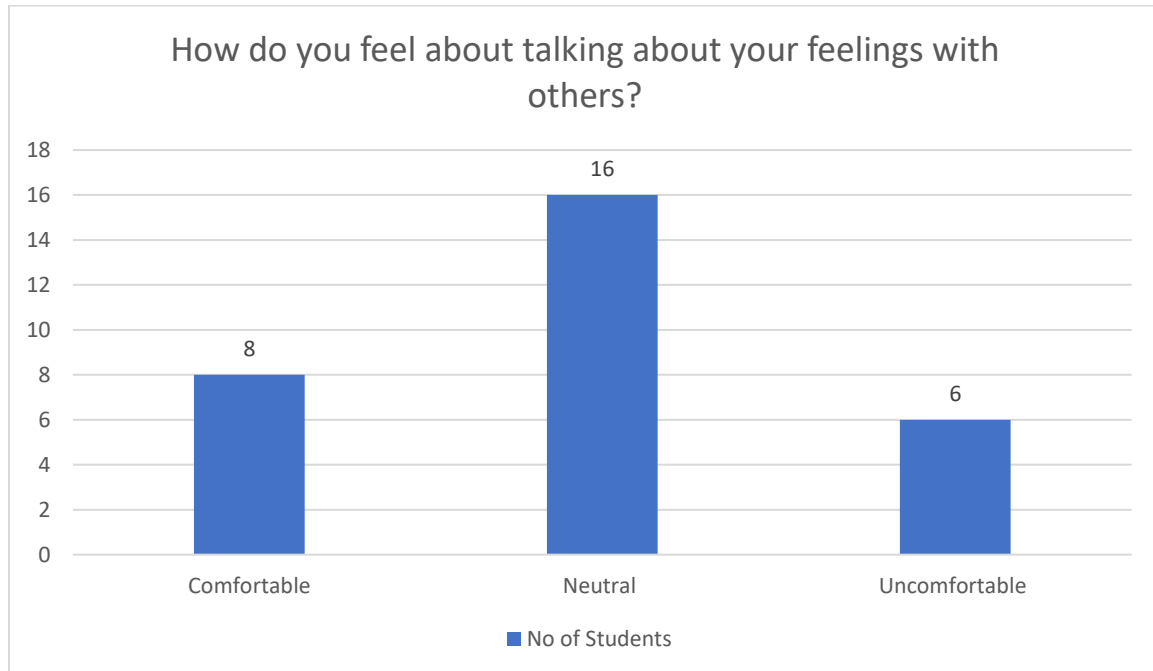


Figure 3. 11 Bar Graph of Student's Comfort Levels Discussing Their Feelings

Based on the graph (Figure 3.11), 18 participants (60%) feel comfortable talking about their feelings, 16 participants (53.3%) are neutral, and 6 participants (20%) feel uncomfortable. The highest frequency (60%) is among those comfortable discussing their feelings, showing a positive trend towards openness. The lowest frequency (20%) for those uncomfortable indicates a smaller, yet significant, group needing more support to express their emotions.

Question 11: When you feel sad or worried, who do you usually talk to? (You can choose more than one)

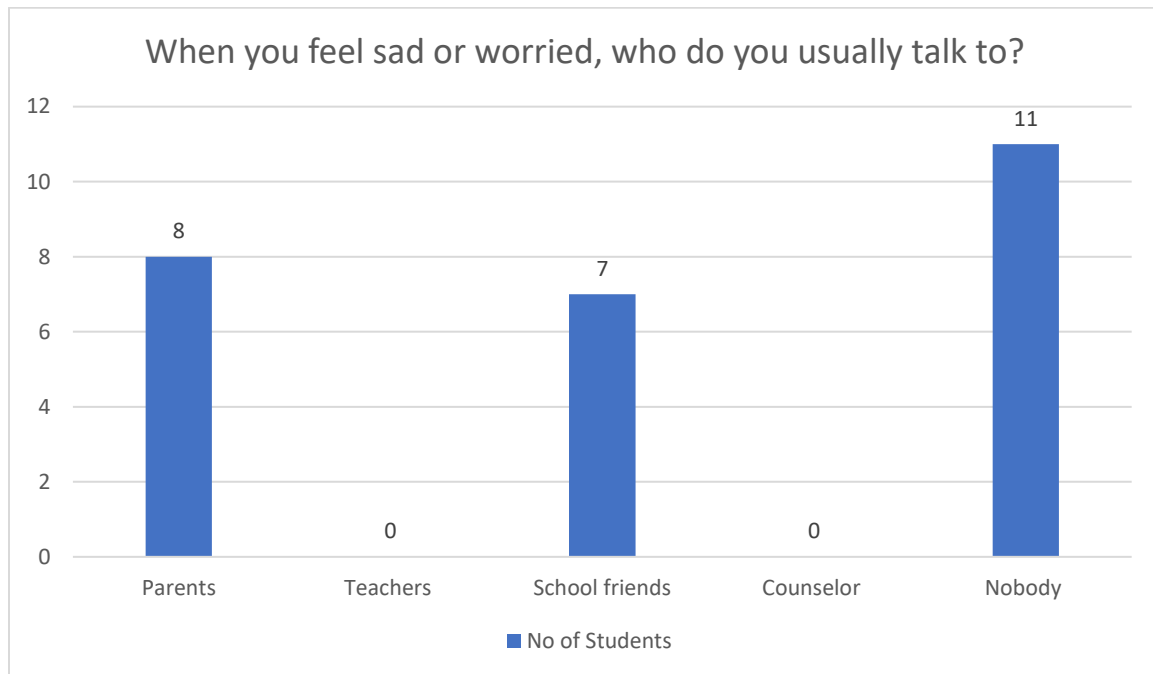


Figure 3. 12 Bar Graph of Student's Preferred Support System During Emotional Distress

Based on Figure 3.12, 12 participants (40%) usually talk to their parents when they feel sad or worried, 7 participants (23.3%) talk to school friends, and 11 participants (36.7%) talk to nobody. No participants indicated talking to teachers or counselors. The highest frequency (40%) is for students who talk to their parents, while the lowest frequency (0%) is for those who talk to teachers or counselors. This data highlights that while parents are the primary support source, a significant number of students (36.7%) choose not to confide in anyone, indicating a need for better support systems in the school.

Part 4: App Features and Preferences

Question 12: What type of activities do you enjoy the most on apps? (You can choose more than one)

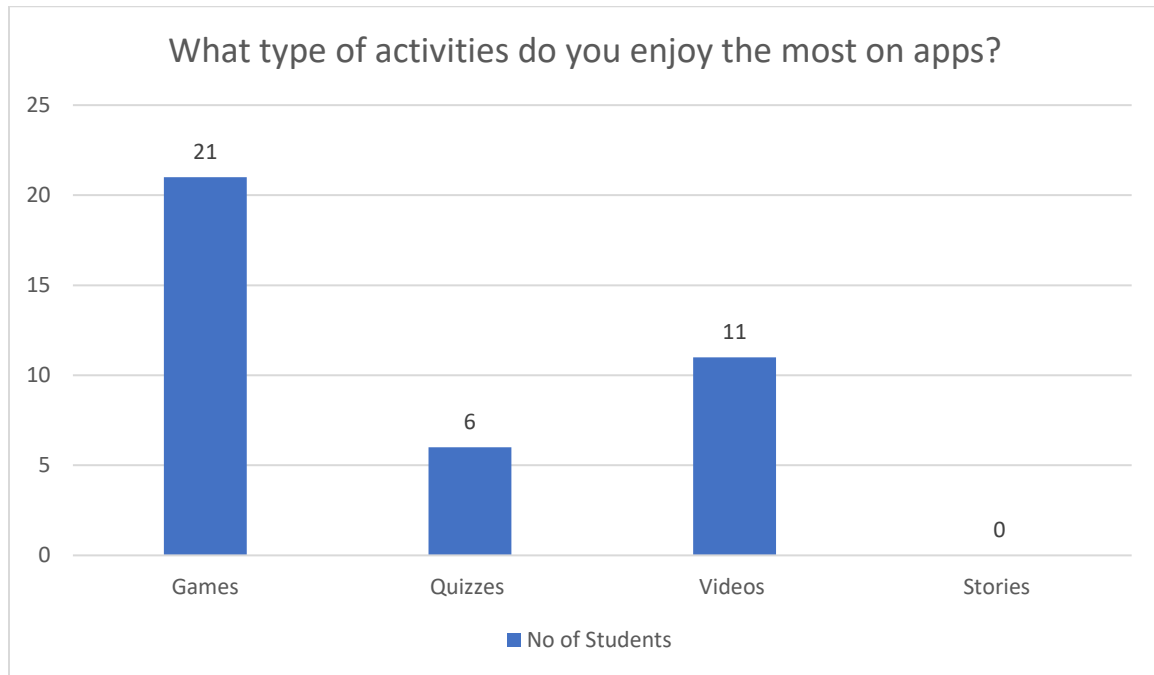


Figure 3. 13 Bar Graph of Students' Preferred Activities on Apps

Based on the graph (Figure 3.13), 21 participants (70%) enjoy games the most on apps, 6 participants (20%) prefer quizzes, 11 participants (36.7%) like videos, and 0 participants (0%) selected stories. The highest frequency (70%) is for games, indicating that gaming is the most popular activity among students. The lowest frequency (0%) is for stories, showing no interest in this type of activity. This suggests that interactive and engaging formats like games and videos are more appealing to the students.

Question 13: What would make learning about feelings and mental health more fun? (You can choose more than one)

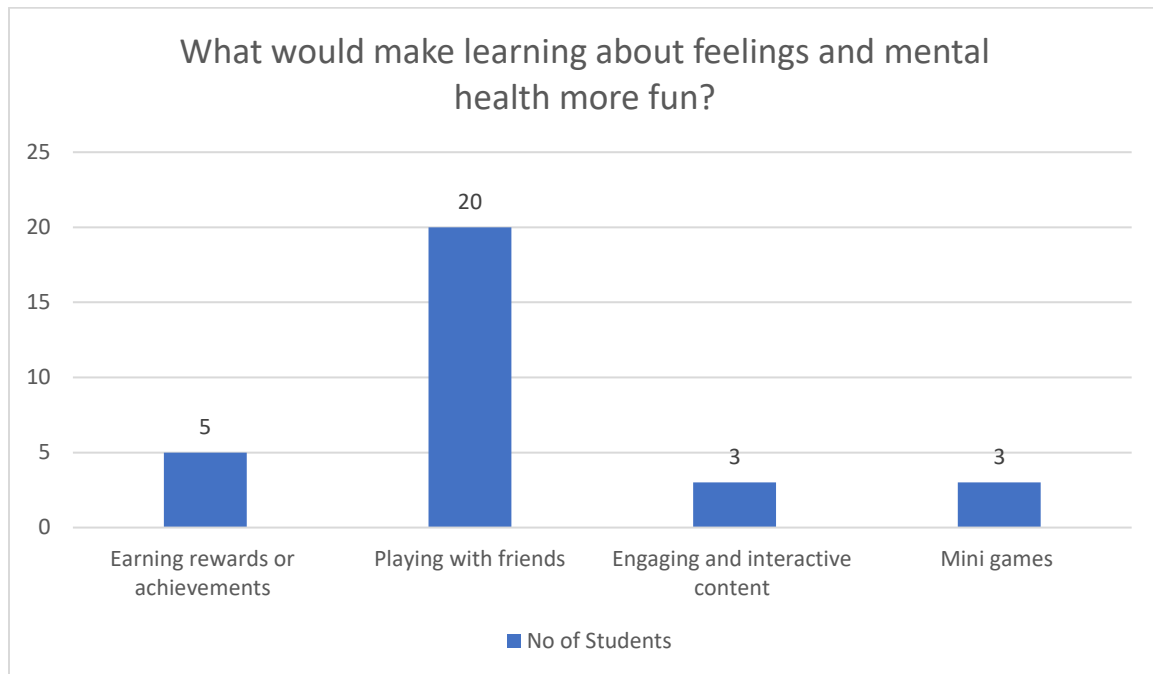


Figure 3. 14 Bar Graph of Students' Suggestions for Making Mental Health Learning Enjoyable

Based on Figure 3.14, 5 participants (16.7%) are motivated by earning rewards or achievements, 20 participants (66.7%) enjoy playing with friends, and 3 participants (10%) prefer engaging and interactive content. The highest frequency (66.7%) is for playing with friends, showing that social interaction is a significant factor in making learning about feelings and mental health more fun. The lowest frequency (10%) is for engaging and interactive content, suggesting that while important, it is less prioritized compared to social elements like playing with friends.

Part 5: Visual Preferences

Question 14: What type of visual elements do you find most appealing in an app? (You can choose more than one)

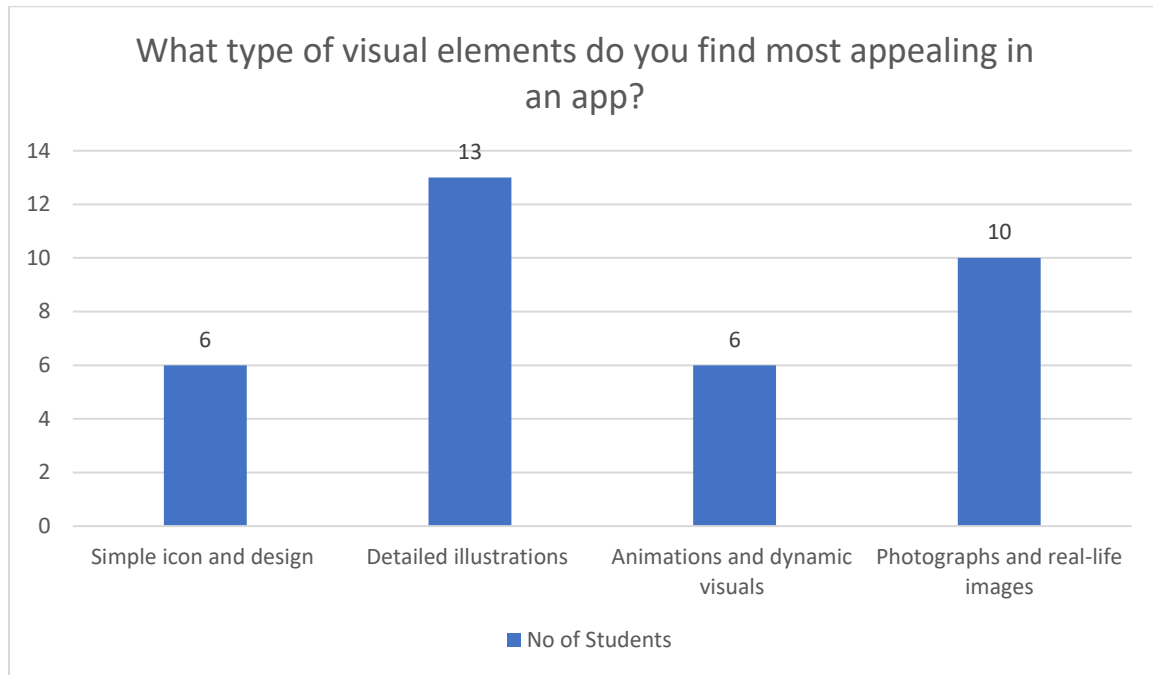


Figure 3. 15 Bar Graph of Students' Preferred Visual Elements in Apps

Based on Figure 3.15, 6 participants (20%) prefer simple icons and designs, 13 participants (43.3%) favor detailed illustrations, 6 participants (20%) like animations and dynamic visuals, and 10 participants (33.3%) prefer photographs and real-life images. The highest frequency (43.3%) is for detailed illustrations, indicating that students find these the most appealing visual elements. The lowest frequency (20%) is shared between simple icons and animations, showing a lesser preference for these elements. This suggests a strong preference for visually rich and detailed content.

Part 6: User Experience

Question 15: How long would you like to spend on the app at one time? (You can choose more than one)

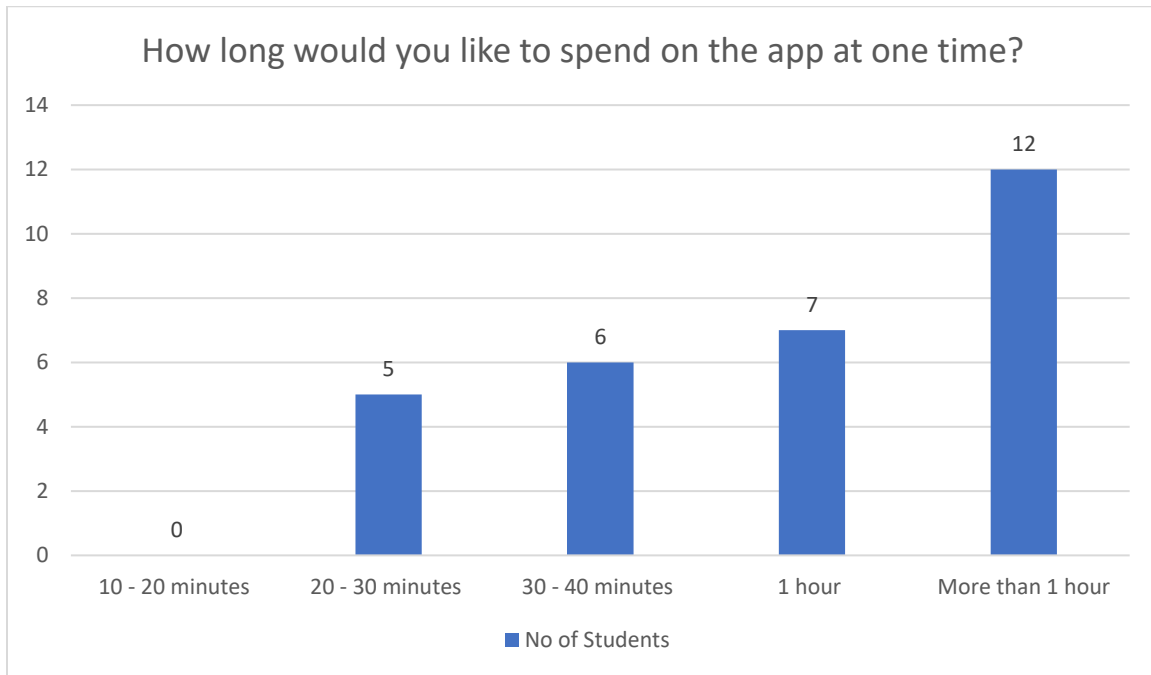


Figure 3. 16 Bar Graph of Preferred App Usage Duration Among Students

Based on the graph (Figure 3.16), 0 participants (0%) prefer spending 10 to 20 minutes on the app, 5 participants (16.7%) prefer 20 to 30 minutes, 6 participants (20%) prefer 30 to 40 minutes, 7 participants (23.3%) prefer 1 hour, and 12 participants (40%) prefer more than 1 hour. The highest frequency (40%) is for spending more than 1 hour on the app, indicating that many students are willing to engage with the app for extended periods. The lowest frequency (0%) is for the 10 to 20-minute range, suggesting that very short usage times are not favored. This highlights a preference for longer, immersive interactions with the app.

3.2.3 List of Required Requirements for The Proposed System

These are the requirements that have been gathered from the interview as well as the questionnaire:

1. Register an account
2. Login
3. Update account
4. Module Management
5. Self-Assessment Test
6. Progress Tracking
7. Quiz System
8. Admin Dashboard

3.3 System Design

3.3.1 Overview

This phase focuses on the architecture of the MyMindaHub web app which will aid in dissecting and understanding the framework as well as the establishment of the development. The system design categorized into two parts: logical and physical. The logical design consists of the Context diagram, Data Flow Diagram, Entity Relationship Diagram (ERD) and Data Dictionary whereas the physical design consist of the user interface design.

Although they are often used interchangeably, context diagrams and data flow diagrams are not the same thing. While data flow diagrams offer more information about a system than a context diagram, context diagrams concentrate on how external entities interact with your system. The two differ greatly from one another nevertheless both is able to clearly display the structure of the project.

3.3.2 Context Diagram

Context diagrams are high-level visual representations that illustrate how a system under development interacts with its external objects, including users, other systems, or processes. They give an overview of the system's compatibility with its surroundings without delving into its internal workings (GeeksforGeeks, 2024). Figure 3.17 shows the roles such as Year 5 Student and Counsellor who acts as the admin as well as their respective interactions with the system.

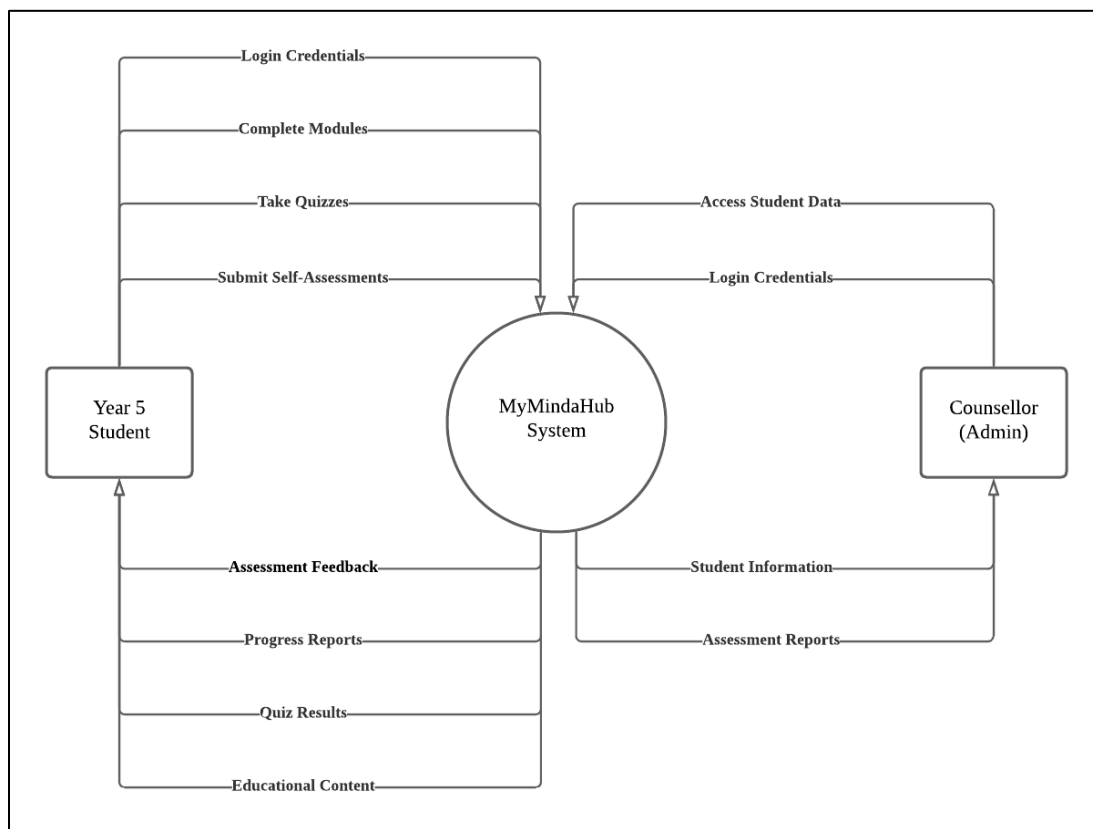


Figure 3. 17 Context Diagram

3.3.3 Data Flow Diagram

3.3.3.1 Data Flow Diagram Level 1

A data flow diagram is a visual depiction of how information moves through a system. It displays the flow of data into the system from the outside as well as the data's movement between processes (Aleryani, A. Y., 2016). A data flow diagram shows the interconnected data flows as well as the external entities, data repositories, and activities in a business or other system (Elmasri, R., & Navathe, S., 2023). Data Flow Diagram Level-1 breaks down the main operations shown in the context diagram to give a more thorough picture of the system. As shown in Figure 3.3, the MyMindaHub has EIGHT (8) processes, which includes Login, Register Account, Update Account, Module Management, Quiz Process, Assessment System, Progress Tracking and Generate Report (Figure 3.18). Besides that, the DFD Level-1 has FIVE (5) data stores which are User Data, Module Data, Quiz Data, Assessment Data and Progress Data.

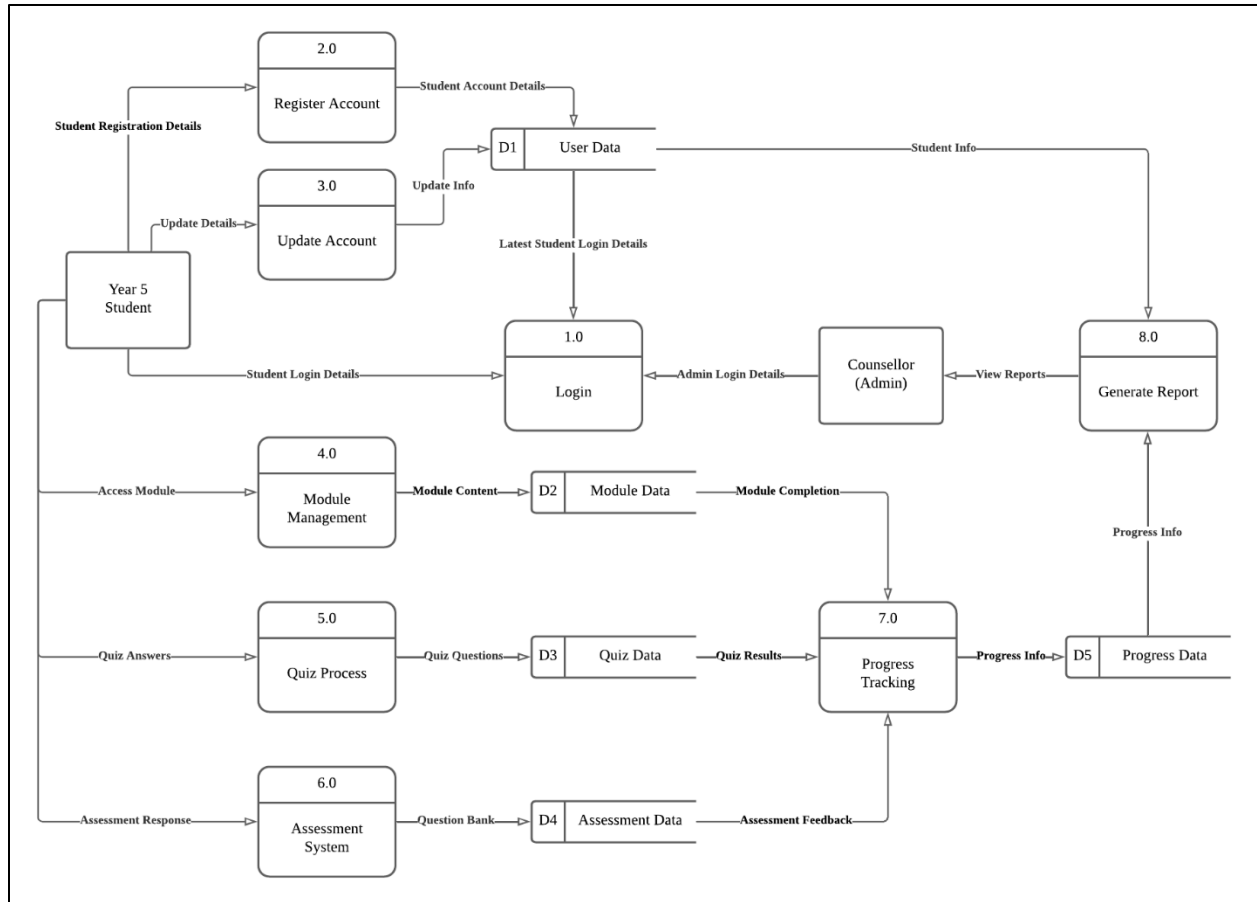


Figure 3. 18 Data Flow Diagram (DFD) Level 1

3.3.3.2 Data Flow Diagram Level 2

Login Process

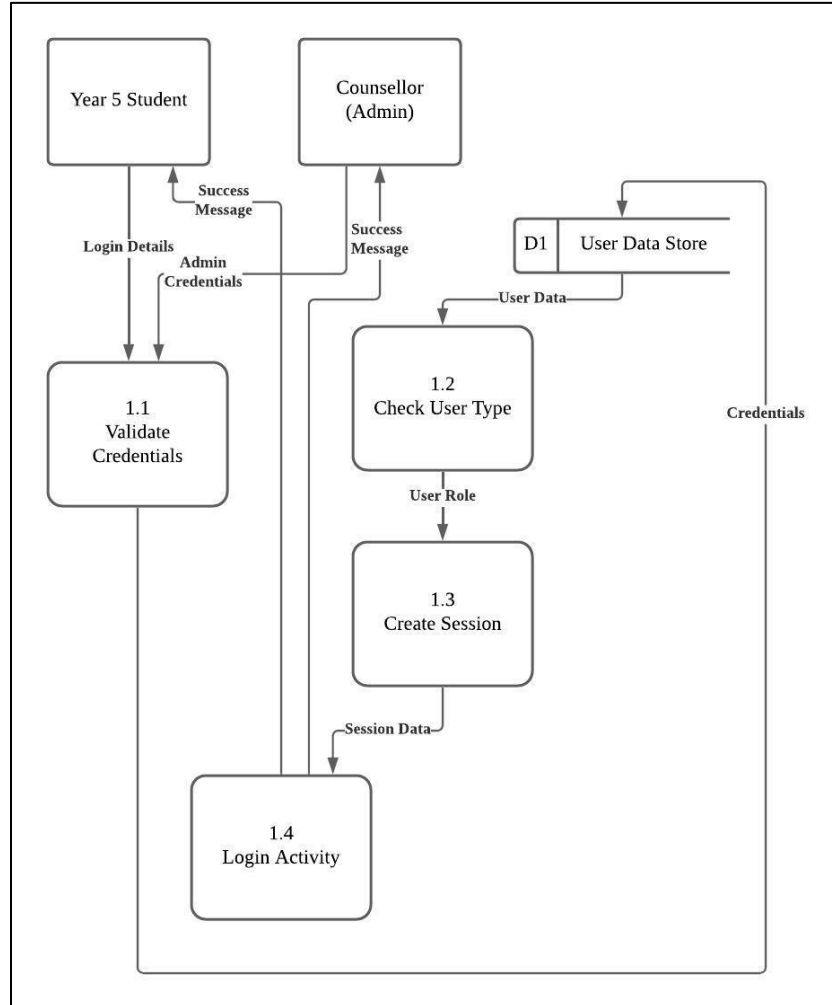


Figure 3. 19 Data Flow Diagram (DFD) Level 2 for Login

The Login Process in MyMindaHub manages user authentication and access control. It begins with credential validation, where the system checks the entered username and password against the User Data Store. Once validated, the system determines the user type, distinguishing between students and counselors (admin), which affects their access rights. Upon successful

authentication, the system creates a user session and logs the login activity for security tracking, providing appropriate access to system features based on the user's role (Figure 3.19).

Account Registration Process

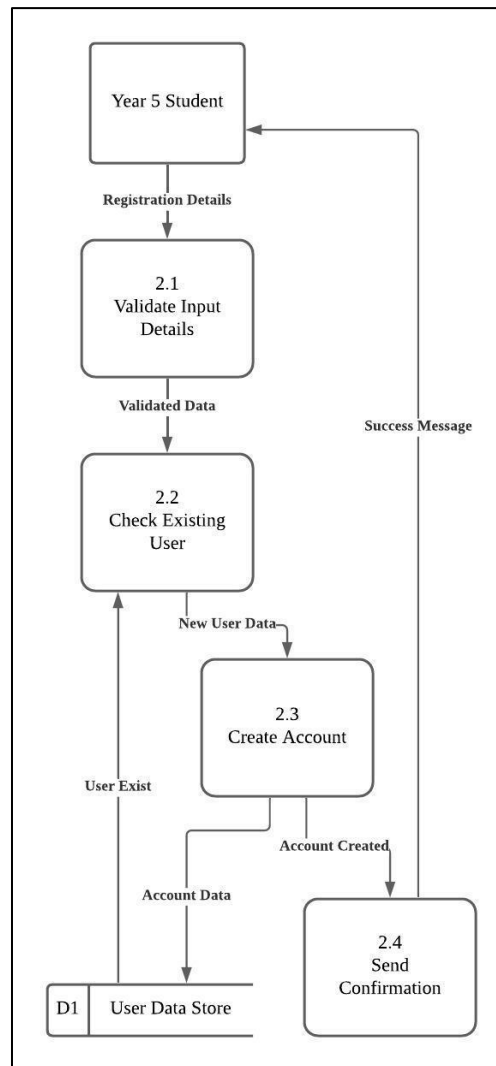


Figure 3. 20 Data Flow Diagram (DFD) Level 2 for Registration

The Account Registration Process handles new user account creation with multiple validation steps (Figure 3.20). When a student submits registration details, the system first validates all input information for completeness. It then checks for existing users in the User Data

Store to prevent duplicate accounts. If validation passes, the system creates a new account, stores the information in the User Data Store, and sends a confirmation to the user, completing the registration process.

Quiz Process

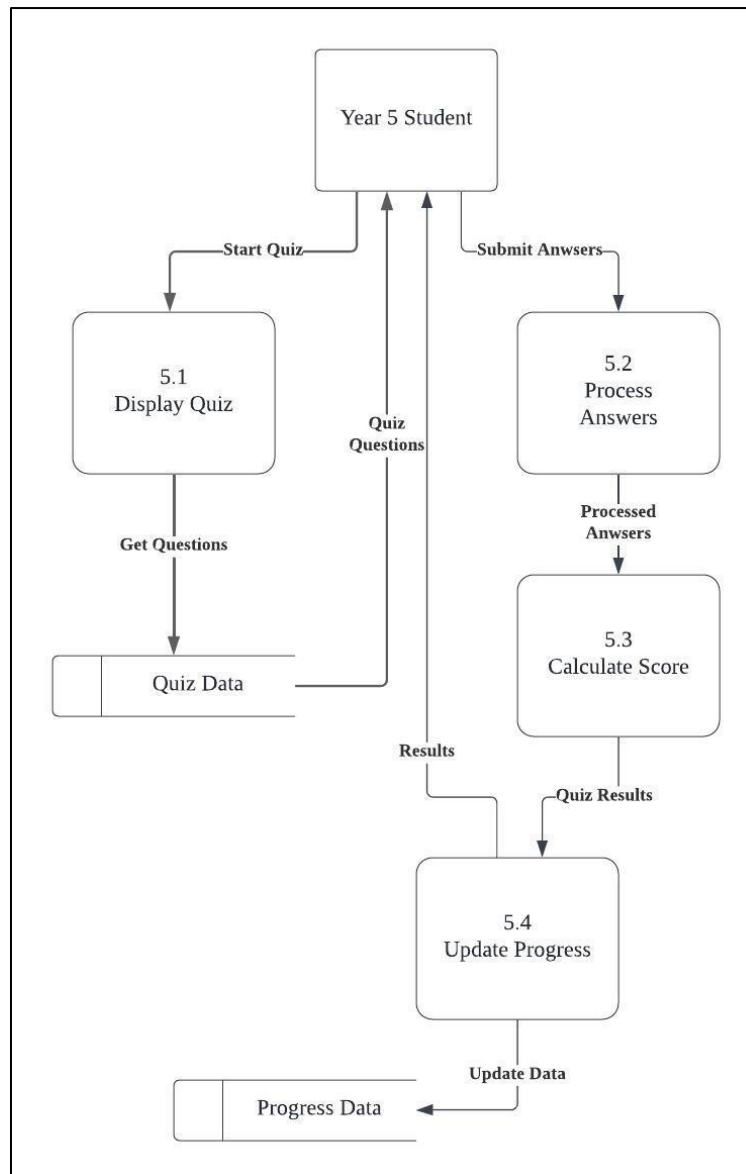


Figure 3. 21 Data Flow Diagram (DFD) Level 2 for Quiz

The Quiz Process facilitates assessment through quizzes. The system retrieves quiz questions from the Quiz Data Store and presents them to students. As students submit their answers, the system processes these responses and calculates scores automatically as shown in Figure 3.21. The results are then stored in the Progress Data Store and displayed to the student, providing immediate feedback on their performance while maintaining a record of their quiz achievements.

Assessment Process

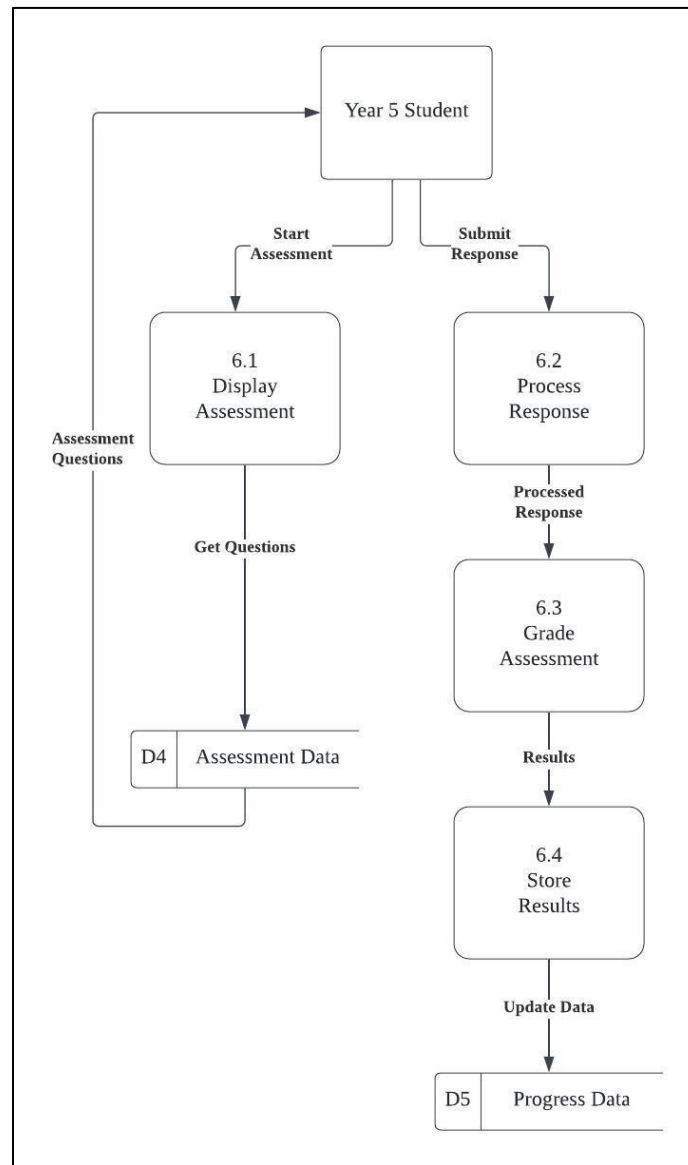


Figure 3. 22 Data Flow Diagram (DFD) Level 2 for Assessment System

The Assessment System Process manages formal evaluations and feedback mechanisms (Figure 3.22). It begins by retrieving and displaying assessment questions from the Assessment Data Store. When students submit their responses, the system processes and grades them according to predetermined criteria. The system then generates detailed feedback for the student and stores

the assessment results in the Progress Data Store, creating a comprehensive record of student performance and providing valuable insights for both students and educators.

3.3.4 Entity Relationship Diagram

The relationships between entities are shown visually in entity relationship diagrams or also known as the ERD. The logical structure of databases can be depicted by an entity relationship diagram as shown in Figure 3.24, which defines the entities, their characteristics, and the connections among them.

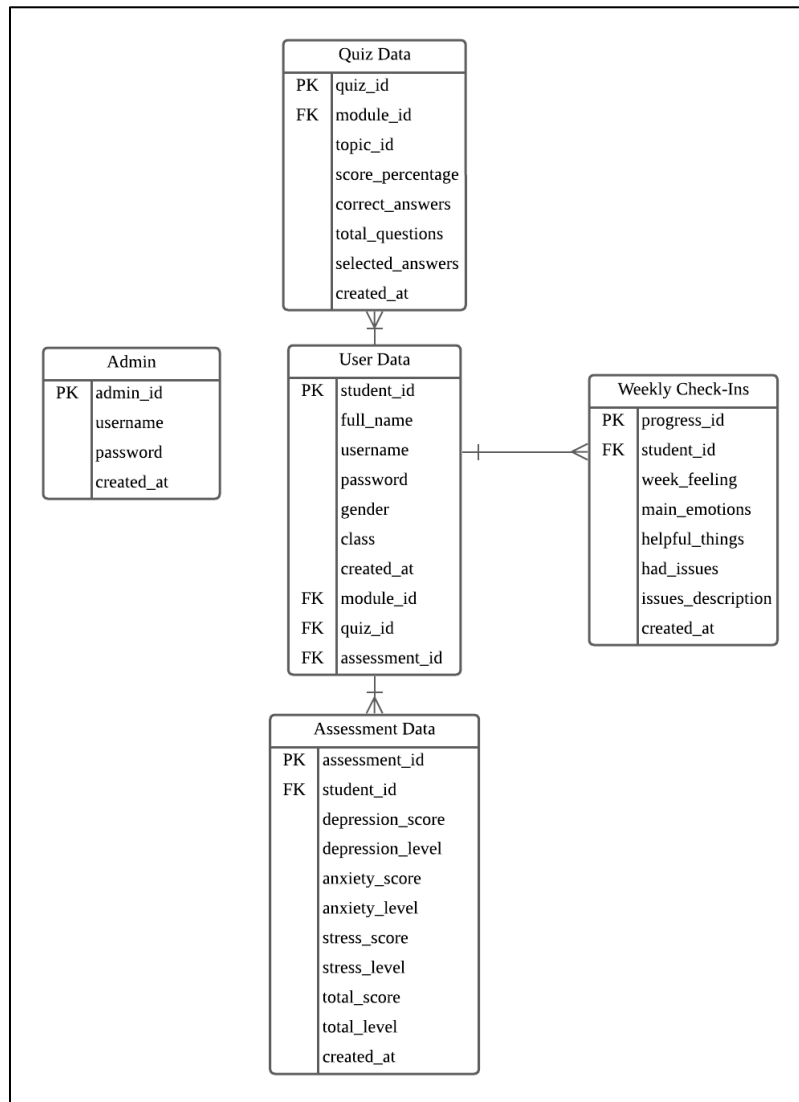


Figure 3. 23 Entity Relationship Diagram (ERD)

3.3.5 Data Dictionary

3.3.5.1 Student Table

Table 3.1 presents the data dictionary for the Student Table, which stores user-related information such as student_id, full name, username, password, gender, class, and a timestamp indicating when the account was created. This table serves as the primary reference for student users in the system.

Table 3. 1 Data Dictionary for Student Table

Table Name	Field	Type	Null	Key
Student	student_id	int(10)	No	PK
	full_name	varchar(50)	No	
	username	varchar(50)	No	
	password	varchar(100)	No	
	gender	varchar(100)	No	
	class	varchar(20)	No	
	created_at	timestampz		

3.3.5.2 Admin Table

Table 3.2 describes the Admin Table, which contains administrative login credentials. It includes fields such as admin_id, username, password, and the created_at timestamp. This table is used to manage and authenticate system administrators.

Table 3. 2 Data Dictionary for Admin Table

Table Name	Field	Type	Null	Key
Admin	admin_id	int(10)	No	PK
	username	varchar(100)	No	
	password	text	No	
	created_at	timestampz		

3.3.5.3 Quiz Results Table

Table 3.3 outlines the structure of the Quiz Results Table, which records students' quiz performance. It includes fields like quiz_id, student_id, topic_id, score percentage, number of correct answers, total questions, selected answers, and the date and time the quiz was taken.

Table 3. 3 Data Dictionary for Quiz Results Table

Table Name	Field	Type	Null	Key
Quiz Results	quiz_id	int(10)	No	PK
	student_id	int(10)	No	FK
	topic_id	text	No	
	score_percentage	int(10)	No	
	correct_answers	int(10)	No	

	total_questions	int (10)	No	
	selected_answers	int []	No	
	created_at	timestampz		

3.3.5.4 Assessment Results Table

Table 3.4 details the Assessment Results Table, used to store data from mental health assessments. It includes scores and levels for depression, anxiety, and stress, as well as an overall total score and level. Each record is linked to a student through student_id and includes a created_at timestamp.

Table 3. 4 Data Dictionary for Assessment Table

Table Name	Field	Type	Null	Key
Assessment Results	assessment_id	int(10)	No	PK
	student_id	int(10)	No	FK
	depression_score	int(10)	No	
	depression_level	text	No	
	anxiety_score	int(10)	No	
	anxiety_level	text	No	
	stress_score	int(10)	No	
	stress_level	text	No	
	total_score	int(10)	No	
	total_level	text	No	
	created_at	timestampz		

3.3.5.5 Weekly Check-Ins Table

Table 3.5 contains the structure for the Weekly Check-ins Table, which tracks students' emotional progress weekly. It stores data on how the student felt that week, key emotions, helpful activities, any issues they faced, issue descriptions, whether help is needed, and a timestamp of when the check-in was recorded. This table helps monitor ongoing emotional well-being and support needs.

Table 3. 5 Data Dictionary for Weekly Check-Ins Table

Table Name	Field	Type	Null	Key
Weekly Check-ins	progress_id	int(10)	No	PK
	student_id	int(10)	No	FK
	week_feeling	text	No	FK
	main_emotions	text[]	No	FK
	helpful_things	text[]	No	FK
	had_issues	bool		
	issue_description	text		
	needs_help	text		
	created_at	timestampz		

3.3.6 Interface Design

The primary objective of user interface (UI) design is to ensure that the features and architecture of the proposed system are not only visually appealing but also intuitive, user-friendly, and efficient in delivering the desired functionality. An effective user interface (UI) streamlines and simplifies interactions. Understanding user needs and making sure the interface is simple to

use are the main goals of UI design (GeeksforGeeks, 2024b). In order to visualize and refine these design goals prior to proceeding into detailed development, wireframes are an essential first step. The following figures shows the wireframe of design for the user interface of the MyMindaHub web app.

3.3.6.1 Home Page

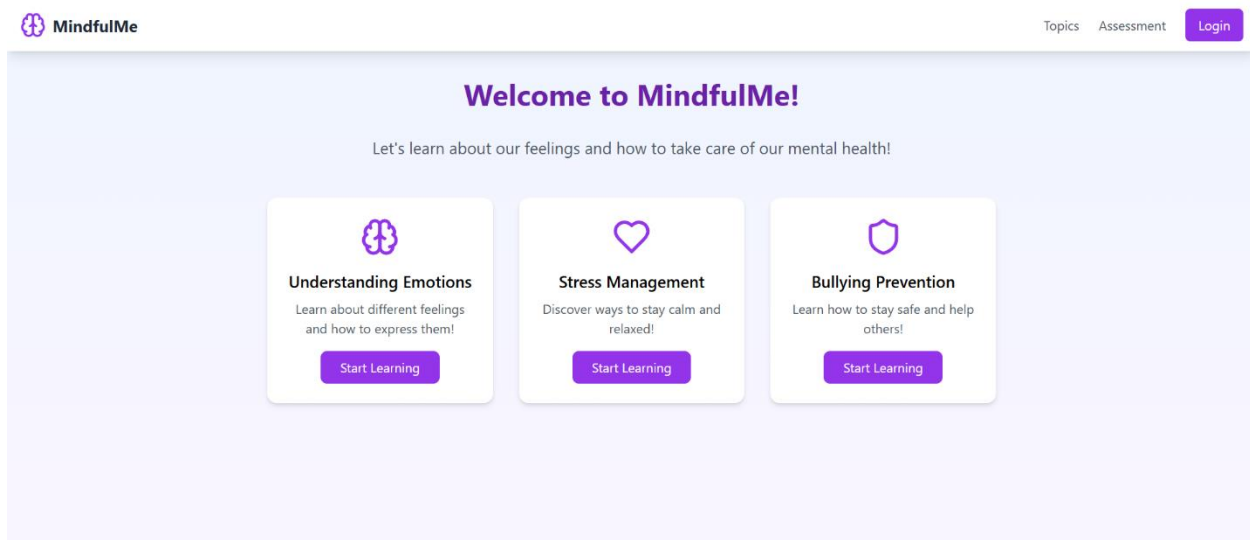
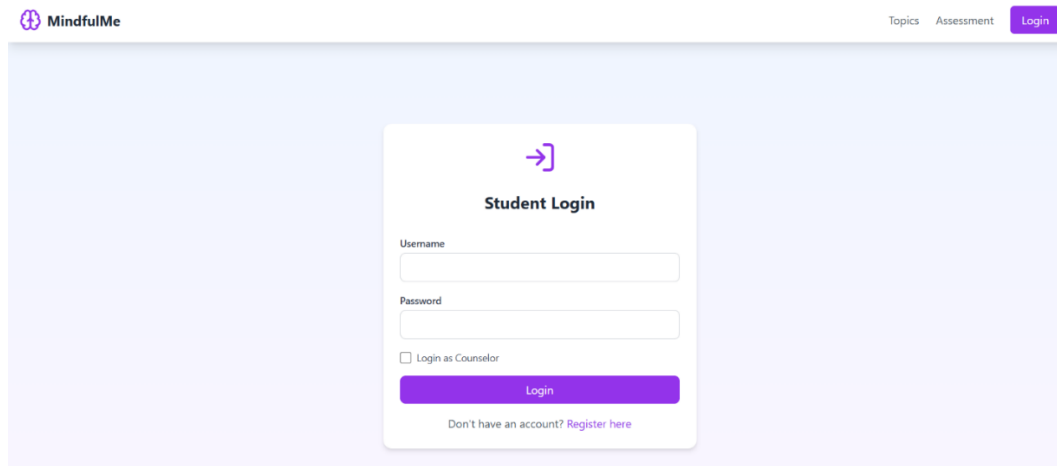


Figure 3. 24 Home Page Interface

The home page is the first page the guest will see when visiting the MyMindaHub web app (Figure 3.24). The guest will be able to log in or either register in the page.

3.3.6.2 Login Page

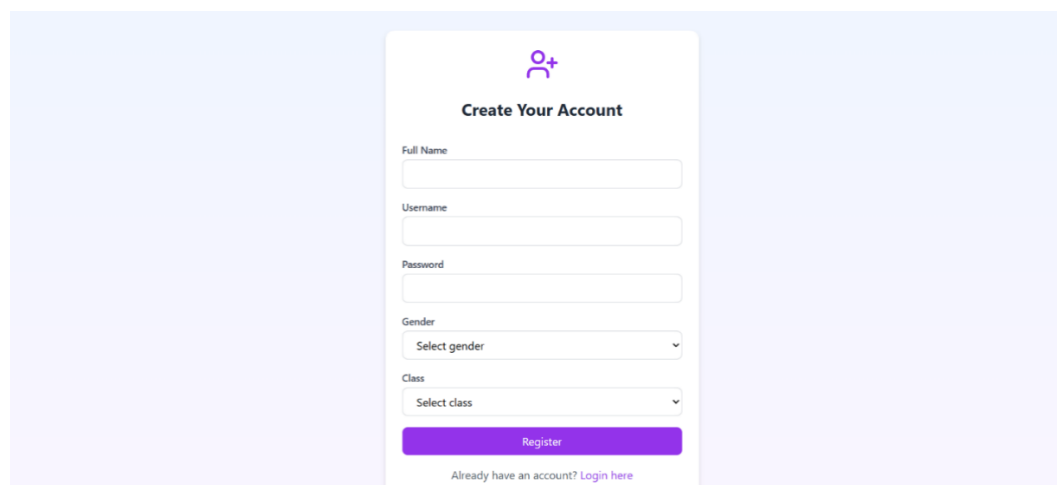


The screenshot shows the 'Student Login' interface on the MindfulMe website. At the top left is the 'MindfulMe' logo. At the top right are links for 'Topics', 'Assessment', and a purple 'Login' button. The main content area features a white card with a purple icon of a person with an arrow pointing to the right. Below the icon is the title 'Student Login'. The form includes a 'Username' input field, a 'Password' input field, and a checkbox labeled 'Login as Counselor'. A purple 'Login' button is positioned below the password field. At the bottom of the card, there is a link: 'Don't have an account? Register here'.

Figure 3. 25 Login Page Interface

The login page allows returning users to access their MyMindaHub account by entering their registered username and password (Figure 3.25).

3.3.6.3 Sign Up Page



The screenshot shows the 'Create Your Account' interface on the MindfulMe website. At the top left is the 'MindfulMe' logo. At the top right are links for 'Topics', 'Assessment', and a purple 'Login' button. The main content area features a white card with a purple icon of a person with a plus sign. Below the icon is the title 'Create Your Account'. The form includes a 'Full Name' input field, a 'Username' input field, a 'Password' input field, a 'Gender' dropdown menu with the text 'Select gender', and a 'Class' dropdown menu with the text 'Select class'. A purple 'Register' button is positioned below the class dropdown. At the bottom of the card, there is a link: 'Already have an account? Login here'.

Figure 3. 26 Sign Up Page Interface

The sign-up page enables new users to create an account by filling in their details such as name, username, password, gender and class (Figure 3.26).

3.3.6.4 Topics Page

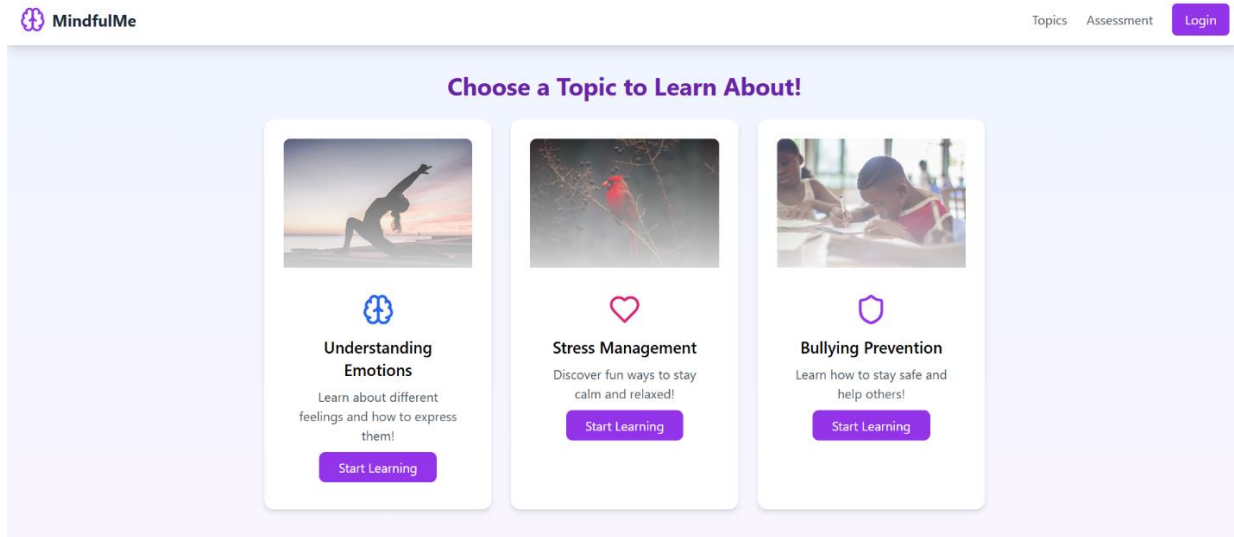


Figure 3. 27 Topics Page Interface 1

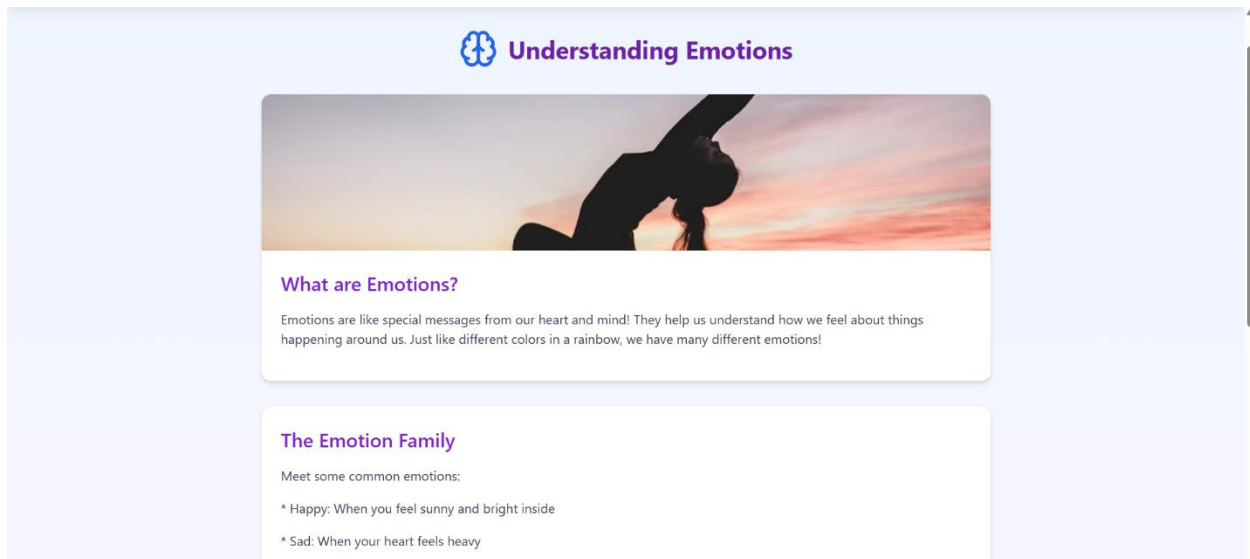


Figure 3. 28 Topics Page Interface 2

The topics page displays a list of available topics for the student to choose from as shown in Figure 3.27. Each topic provides a simple information on its respective topics as shown in Figure 3.28 and leads to related quizzes and assessments.

3.3.6.5 Quiz Page

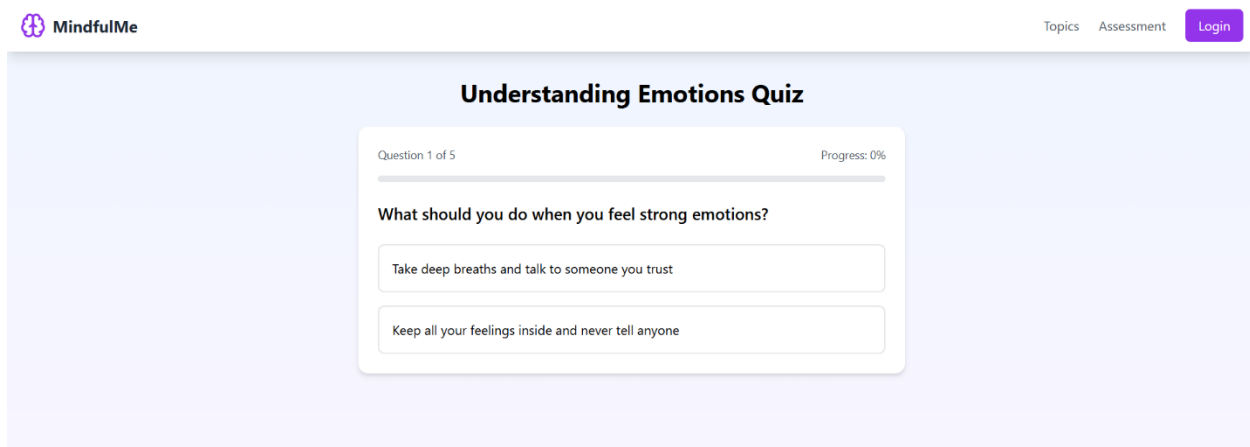


Figure 3. 29 Quiz Page Interface 1

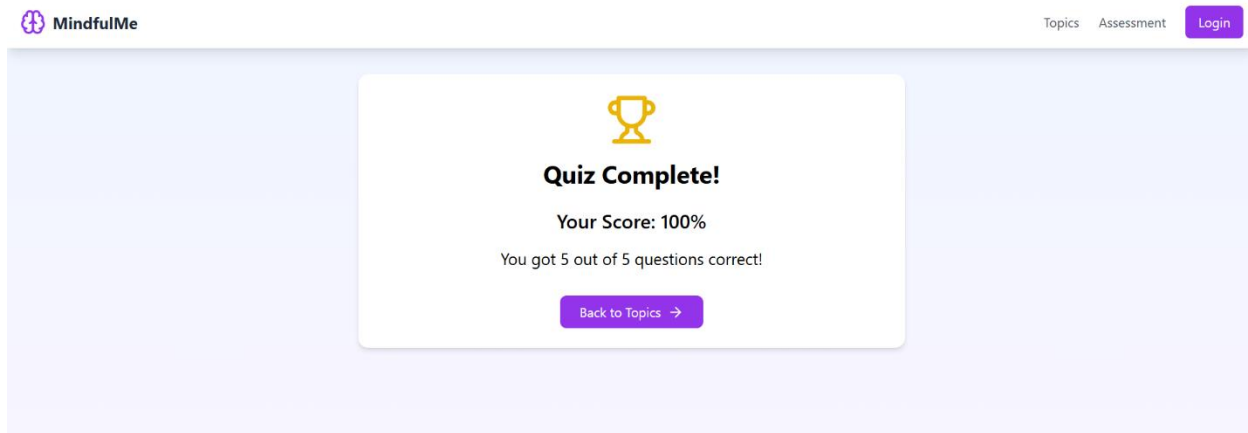


Figure 3. 30 Quiz Page Interface 2

The quiz page presents 5 simple multiple-choice questions based on the selected topic as shown in Figure 3.29. After the students can answer and submit their responses for scoring (Figure 3.30).

3.3.6.6 Assessment Page

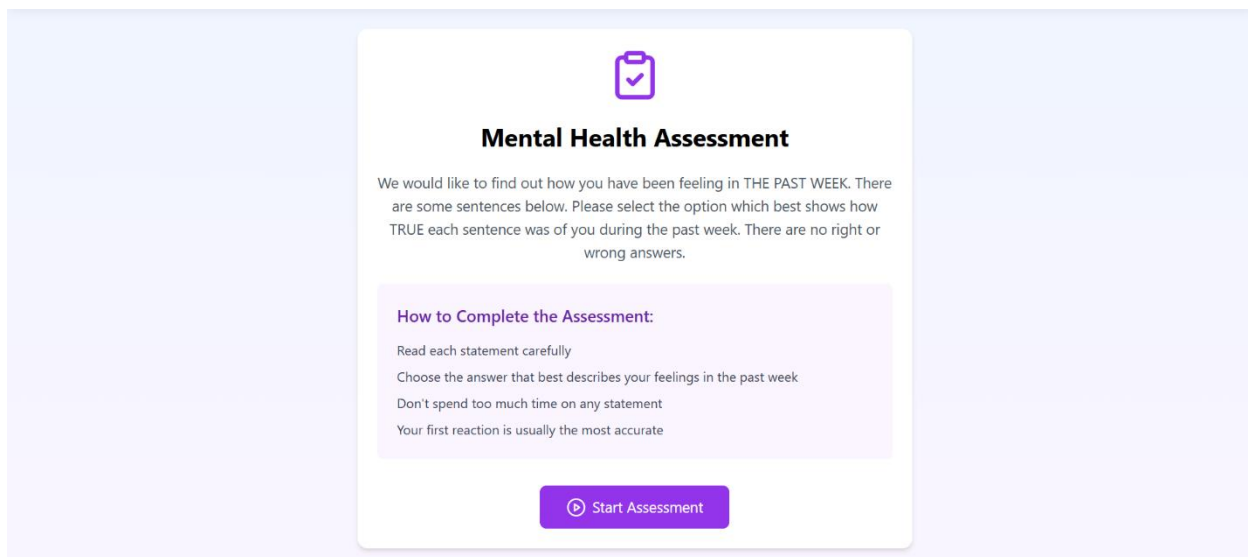


Figure 3. 31 Assessment Page Interface 1

MindfulMe

Topics Assessment Login

Mental Health Assessment

Question 6 of 21 Progress: 24%

I found myself over-reacting to situations

Not True

A Little True

Fairly True

Very True

Figure 3. 32 Assessment Page Interface 2

Assessment Results

Depression
Score: 9 Moderate

Anxiety
Score: 6 Mild

Stress
Score: 4 Normal

Total Score
Score: 19 Normal

Based on your responses, your overall stress level is **normal**. Remember that this is just a screening tool and not a diagnosis. If you're concerned about your results, please speak

Figure 3. 33 Assessment Page Interface 3

The assessment page allows students to complete mental health assessments called DASS-Y which includes depression, anxiety, and stress tests (Figure 3.31). The Depression Anxiety Stress

Scales – Youth version (DASS-Y) is an adaptation of the DASS-21 tailored for individuals aged 7 to 18. It assesses overall psychological distress and the emotional states of depression, anxiety, and stress. Respondents rate each item using four options: “Not True,” “A Little True,” “Fairly True,” and “Very True,” as illustrated in Figure 3.32. After that, the results of the assessment will be displayed for the students to view (Figure 3.33).

3.3.6.7 Student Dashboard

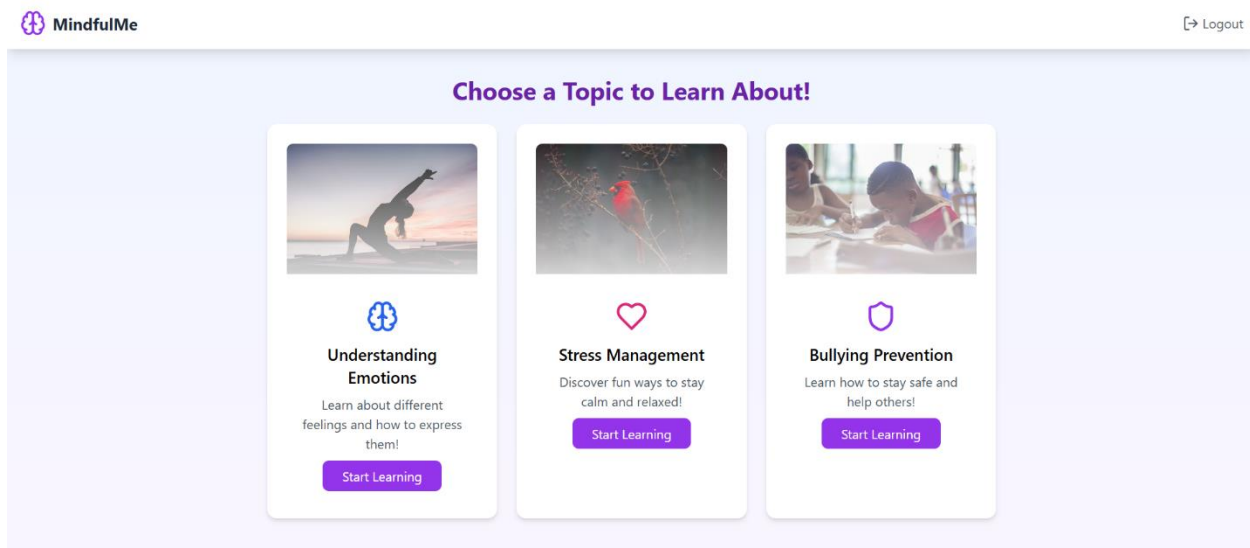


Figure 3. 34 Student Dashboard Interface

The student dashboard provides an overview of the student's progress, including completed quizzes, assessment history, and available topics as shown in Figure 3.34.

3.3.6.8 Admin Dashboard

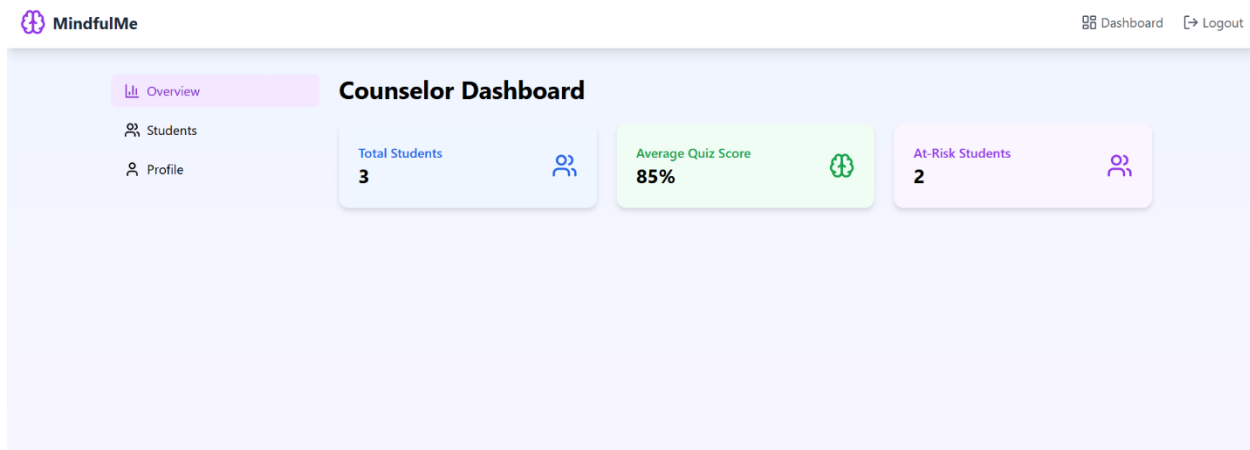


Figure 3. 35 Admin Dashboard Interface 1

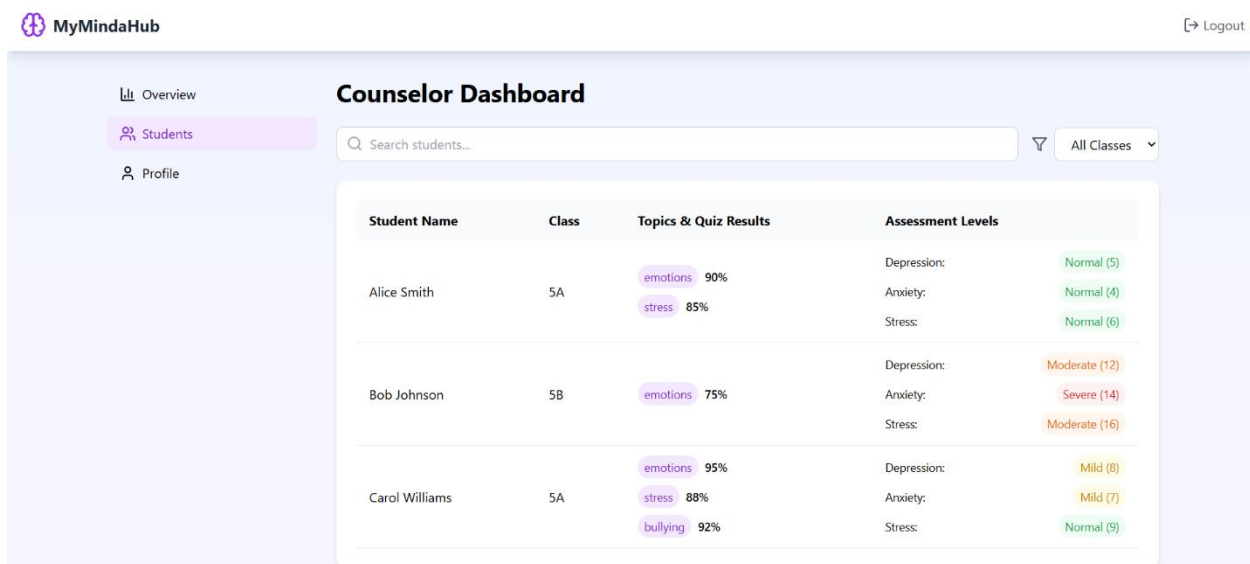


Figure 3. 36 Admin Dashboard Interface 2

The admin dashboard is accessible by counselors to view analytics on total students, average quiz score and at-risk students as shown in Figure 3.35. It provides access to student data, quiz results, and assessment records for review (Figure 3.36).

3.4 Summary

The MyMindaHub web app is developed using the Waterfall Model. In its FIVE (5) steps, the Waterfall Model outlines all of the system's needs in detail at the outset. The first phase, two interviews and a questionnaire were conducted to study as well as analyse on the system requirements for the proposed system to be finalized during the development and implementation phase. In addition, the Context Diagram, Data Flow Diagram, Entity Relationship Diagram, and Data Dictionary were developed to describe the system's structures. Aside from that, the chapter also displays the potential UI designs for the web app.

CHAPTER 4: IMPLEMENTATION

4.1 Introduction

This chapter presents the comprehensive implementation of the MyMindaHub system, an educational mental health platform designed for year 5 primary school students to enhance learning through fun modules, quizzes and assessments. The implementation phase involved translating the system design specifications from Chapter 3 into a functional web-based application using modern web development technologies and frameworks.

The implementation process follows a systematic approach, beginning with the selection and configuration of appropriate development tools and technologies. The system architecture emphasizes user experience, scalability, and maintainability through the adoption of contemporary web development practices. This chapter details the technical implementation aspects, including the development environment setup, technology stack integration, and the creation of various system components. The implementation focuses on creating an intuitive user interface that caters to different user roles, including students and administrators, while ensuring seamless functionality across all system modules.

4.2 Implementation Tool

The development of MyMindaHub required careful selection of implementation tools and technologies that align with the project requirements and objectives. The chosen technology stack emphasizes modern web application practices, ensuring optimal performance, maintainability, and scalability of the final product.

4.2.1 Visual Studio Code



Figure 4. 1 Visual Studio Code

Visual Studio Code (VS Code) serves as the primary integrated development environment (IDE) for the MyMindaHub project implementation (Figure 4.1). This choice was motivated by several key advantages that enhance the development workflow and productivity.

VS Code provides comprehensive support for web development technologies, including syntax highlighting, intelligent code completion, and debugging capabilities for JavaScript, TypeScript, and Tailwind CSS. The editor's extensive extension ecosystem allows for seamless integration with React development tools, Git version control, and database management extensions that facilitate Supabase integration.

The integrated terminal feature facilitates effective command-line operations for deployment activities, build procedures, and package management. When working with TypeScript and React components, VS Code's IntelliSense feature which offers real-time error detection, auto-completion suggestions, and inline documentation references significantly enhances the quality of code. Code repository management, branch switching, and collaborative

development processes are made possible via the editor's Git integration, which simplifies version control procedures.

4.2.2 React



Figure 4. 2 React

The MyMindaHub frontend implementation uses the React framework, a component-based architecture that offers a robust and efficient approach to building interactive user interfaces (Figure 4.2). Its virtual DOM implementation ensures optimal rendering performance, especially for interactive elements like quizzes and games. React's declarative programming paradigm simplifies the development of complex user interface states, making it easier for students and administrators to manage different views.

The component reusability aspect reduces code duplication across the system, ensuring consistency in user experience and improving development efficiency. React's extensive ecosystem offers access to third-party libraries and components, enhancing system functionality. Integration with routing libraries and state management solutions facilitate data flow between components. The framework's strong community support provides comprehensive documentation,

tutorials, and problem-solving resources throughout the development process (Meta Platforms, Inc., n.d.).

4.2.3 Vite



Figure 4. 3 Vite

Vite serves as the build tool and development server for the MyMindaHub project, offering significant advantages in terms of development speed and build optimization (Figure 4.3). The selection of Vite over traditional bundlers like Webpack is motivated by its superior performance characteristics and developer experience enhancements.

Vite's lightning-fast hot module replacement (HMR) capability dramatically improves the development workflow by instantly reflecting code changes in the browser without full page reloads. This feature proves particularly valuable when developing interactive components such as quiz interfaces, games, and dashboard elements, where maintaining application state during development iterations is crucial.

The build tool's native ES module support and optimized dependency pre-bundling result in faster development server startup times, even as the project grows in complexity. Vite's

intelligent code splitting and tree-shaking capabilities ensure that the final production build contains only the necessary code, reducing bundle sizes and improving application loading performance. Vite's seamless integration with TypeScript eliminates the need for additional configuration while providing comprehensive type checking during the development process. The tool's plugin ecosystem offers extensive customization options, allowing for integration with CSS preprocessors, testing frameworks, and deployment tools that support the MyMindaHub development workflow.

4.2.4 Typescript

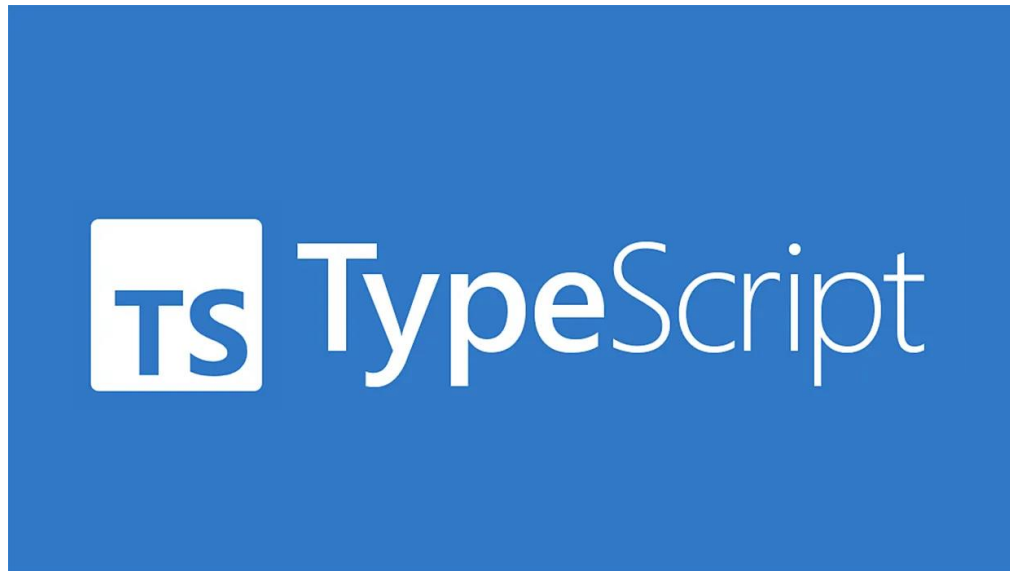


Figure 4. 4 TypeScript

TypeScript implementation throughout the MyMindaHub system provides static type checking and enhanced code reliability, addressing potential runtime errors during the development phase rather than in production (Figure 4.4). The adoption of TypeScript significantly improves code quality and maintainability, particularly important for an educational platform that requires high reliability and stability.

The type system enables clear definition of data structures used throughout the application, including user profiles, quiz questions, assessment results, and administrative data. This explicit typing reduces bugs related to data manipulation and ensures consistent data handling across different system components. Interface definitions for API responses, form inputs, and component properties create a robust foundation for system integration and testing.

The integration between TypeScript and modern IDEs provides enhanced development experience through intelligent autocomplete, refactoring tools, and inline error detection. This combination significantly reduces development time while improving code quality through early error detection and comprehensive IntelliSense support.

4.2.5 Supabase



Figure 4. 5 Supabase

Supabase functions as the backend-as-a-service (BaaS) platform for MyMindaHub, providing comprehensive database management, authentication services, and real-time functionality (Figure 4.5). The selection of Supabase offers several advantages over traditional backend development approaches, particularly in terms of development speed and feature completeness.

The platform's PostgreSQL database foundation provides robust data storage capabilities with support for complex queries, relationships, and data integrity constraints essential for

educational data management. Supabase's automatic API generation creates RESTful endpoints and GraphQL interfaces directly from database schema definitions, eliminating the need for manual API development while ensuring type safety and consistency.

Authentication functionality through Supabase handles user registration, login processes, and session management with built-in security best practices. The platform supports multiple authentication providers and includes features like role-based access control which are crucial for the different user types within the MyMindaHub system. The platform's row-level security policies provide fine-grained access control, ensuring that students can only access their own data while administrators have appropriate system-wide permissions.

4.3 MyMindaHub system prototype

The MyMindaHub system prototype represents the complete implementation of the educational platform, incorporating all designed features and functionalities into a cohesive web application. The prototype demonstrates the practical application of the chosen technology stack and validates the system design decisions through functional user interfaces and backend integration.

4.3.1 System Hierarchy

The system hierarchy of MyMindaHub follows a structured approach that organizes functionality according to user roles and system purposes. The hierarchical structure ensures logical navigation flow and maintains clear separation of concerns between different system components.

At the top level, the system distinguishes between authenticated and non-authenticated states, directing users to appropriate entry points based on their authentication status. Non-

authenticated users access the login and registration interfaces, while authenticated users are routed to role-specific dashboards and functionality areas.

The student hierarchy encompasses the primary learning interfaces, including the module content, quiz interfaces, assessment, and exciting games for engagement enhancement. The student dashboard provides centralized access to progress tracking, and editing personal information from time to time.

Administrative hierarchy which refers mainly to the counselor includes comprehensive system management capabilities, featuring user management interfaces, content administration tools, analytics dashboards, and system configuration options. The administrative structure maintains separation from student-facing interfaces while providing necessary oversight and management capabilities.

4.3.2 Login Page

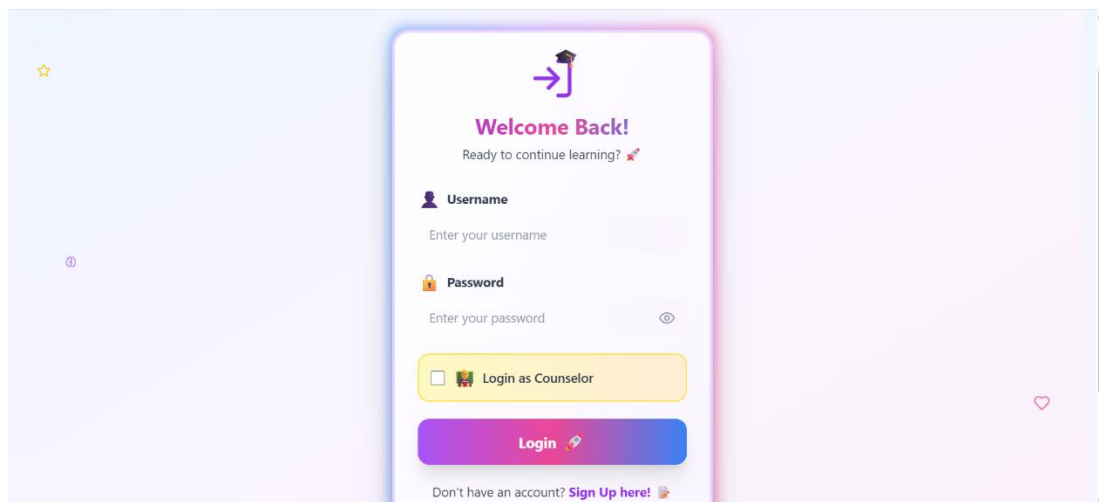


Figure 4. 6 Login Page

The user must first log into the system in order to access other functions. The user needs to input their username and password as shown in Figure 4.6. The user must first create an account if they don't already have one before they can continue with the login procedure. The user will be taken to the Student Dashboard Page of the MyMindaHub System after successfully logging in.

```
const handleSubmit = async (e: React.FormEvent) => {
  e.preventDefault();
  setError('');
  setLoading(true);

  try {
    if (isAdmin) {
      // Query Supabase for admin credentials
      const { data, error: dbError } = await supabase
        .from('admin')
        .select('*')
        .eq('username', username)
        .eq('password', password)
        .single();

      if (dbError || !data) {
        setError('Invalid admin credentials');
        setLoading(false);
        return;
      }
      console.log(data);

      setCurrentUser({
        id: data.id,
        username: data.username,
        role: 'counselor',
        name: data.username,
      });
      navigate('/dashboard');
      return;
    }
  }
}
```

Figure 4. 7 Code Snippet for Login Page 1

```

// Student login: check credentials in student table
const { data: student, error: studentError } = await supabase
  .from('student')
  .select('*')
  .eq('username', username)
  .eq('password', password)
  .single();

if (studentError || !student) {
  setError('Invalid username or password');
  setLoading(false);
  return;
}

setCurrentUser({
  id: student.id,
  name: student.full_name,
  role: 'student',
  class: student.class,
  gender: student.gender,
  username: student.username,
});
navigate('/topics');
} catch (err) {
  setError('Invalid username or password');
} finally {
  setLoading(false);
}
};

```

Figure 4. 8 Code Snippet for Login Page 2

The `handleSubmit` function is the core logic behind the login authentication system in the MyMindaHub web application. This function is triggered when a user submits the login form. It begins by preventing the default form submission behavior and setting the loading state to true (Figure 4.7). Depending on whether the user selects the "Login as Counselor" option (`isAdmin` checkbox), the function queries either the admin table or the student table in the Supabase database using the provided username and password. If the credentials match a record in the database, the user's data is stored in a global state using the `setCurrentUser` function, and the user is redirected to the appropriate route such as counselors to the dashboard and students to the topics page. Based on Figure 4.8, if the credentials are invalid, an error message is shown. This function not only demonstrates role-based login using Supabase's JavaScript client but also highlights effective use

of React's state management and routing through `useState`, `useNavigate`, and error handling mechanisms.

4.3.3 Sign Up

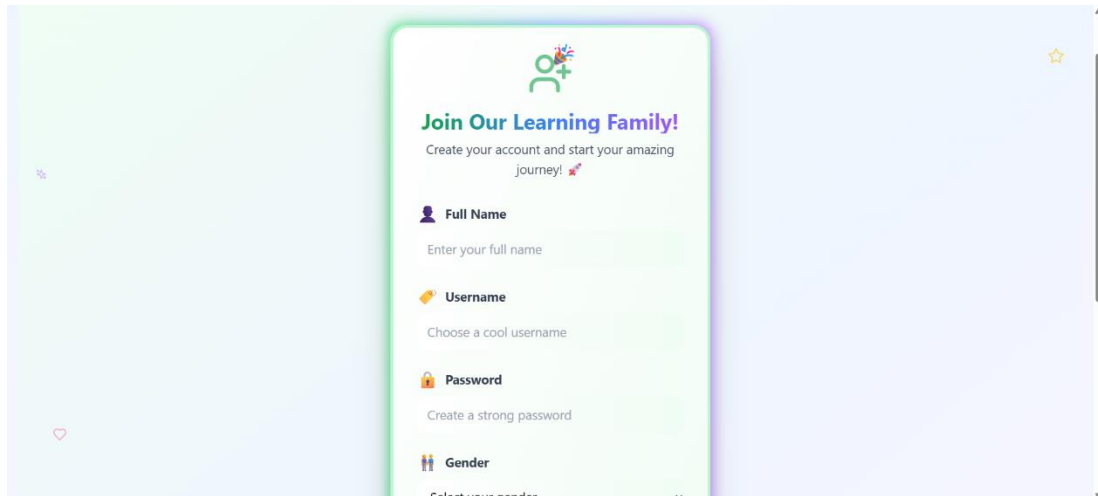
A screenshot of the first page of a sign-up form. The form is centered on a light blue background with a green border. At the top, there is a green icon of a person with a plus sign. Below it, the text "Join Our Learning Family!" is displayed in a bold, green font. Underneath, a smaller text says "Create your account and start your amazing journey!". The form contains four input fields: "Full Name" with a person icon, "Username" with a key icon, "Password" with a lock icon, and "Gender" with a gender icon. Each field has a placeholder text: "Enter your full name", "Choose a cool username", "Create a strong password", and "Select your gender". A yellow star icon is visible in the top right corner of the page.

Figure 4. 9 Sign Up Page 1

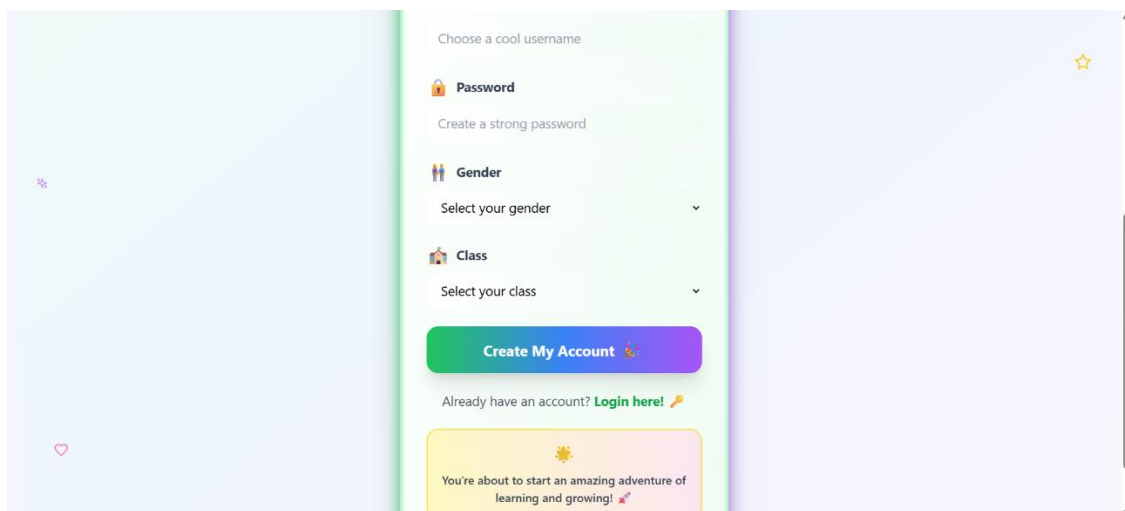
A screenshot of the second page of a sign-up form. The form is centered on a light blue background with a green border. It continues from the previous page with the "Username" field. Below it are the "Password" and "Gender" fields. The "Gender" field is a dropdown menu with the text "Select your gender". Below these is the "Class" field, also a dropdown menu with the text "Select your class". At the bottom of the form is a large green button with the text "Create My Account". Below the button, there is a link that says "Already have an account? Login here!". At the very bottom, there is a yellow box with a sun icon and the text "You're about to start an amazing adventure of learning and growing!". A yellow star icon is visible in the top right corner of the page.

Figure 4. 10 Sign Up Page 2

The user must create an account since they are a new user and do not currently have one (Figure 4.9). Therefore, the user must complete all the necessary fields in order to register in this

system as shown in Figure 4.10. The user will be taken to the Home Page after successfully creating an account, where they must log in using their previously created account.

```
const handleSubmit = async (e: React.FormEvent) => {
  e.preventDefault();
  setError('');

  try {
    // Insert new student into Supabase
    const { error: dbError } = await supabase
      .from('student')
      .insert([
        {
          full_name: formData.fullName,
          username: formData.username,
          password: formData.password,
          gender: formData.gender.charAt(0).toUpperCase() + formData.gender.slice(1).toLowerCase(),
          class: formData.class
        }
      ]);

    if (dbError) {
      if (dbError.code === '23505') {
        setError('Username already exists.');
```

Figure 4. 11 Code Snippet for Sign Up

The handleSubmit function in the Register component is responsible for handling the sign-up process in the MyMindaHub application. When a user submits the registration form, this function prevents the default behavior and then attempts to insert the new user data into the student table in Supabase. It collects user inputs such as full name, username, password, gender, and class from the form state (formData) and formats the gender field appropriately as shown in Figure 4.11. If the insertion is successful, the user is redirected to the login page. If an error occurs, then an appropriate error message is displayed to the user. This function showcases how the application

interacts with the Supabase backend to store user information securely and demonstrates good error handling practices during the user registration process.

4.3.4 Home Page

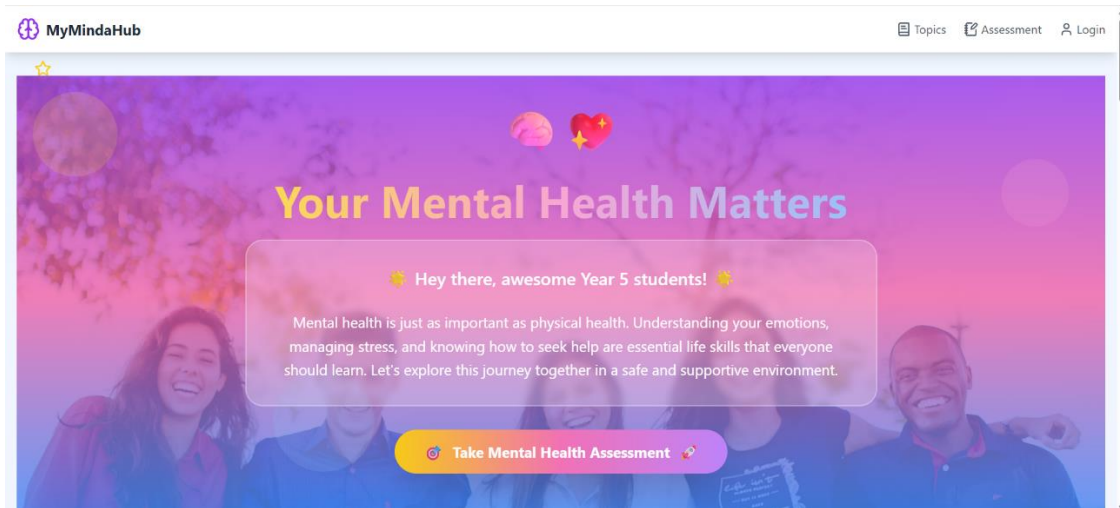


Figure 4. 12 Home Page

The home page serves as the central hub for users, providing navigation overview and quick access to key system functionality (Figure 4.12). The implementation balances information density with usability, ensuring that users can efficiently locate desired features while maintaining visual clarity.

4.3.5 Topics Page

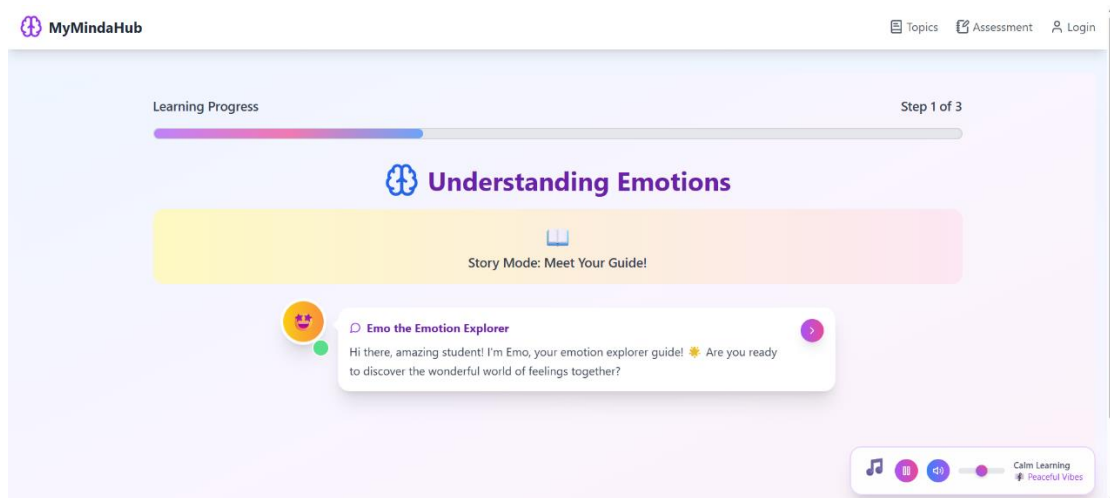


Figure 4. 13 Topics Page 1

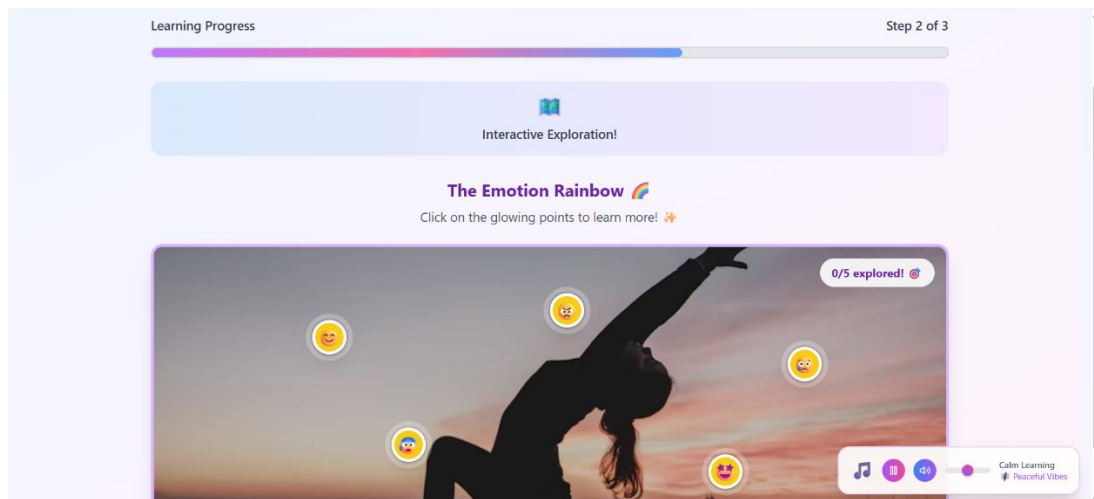


Figure 4. 14 Topics Page 2

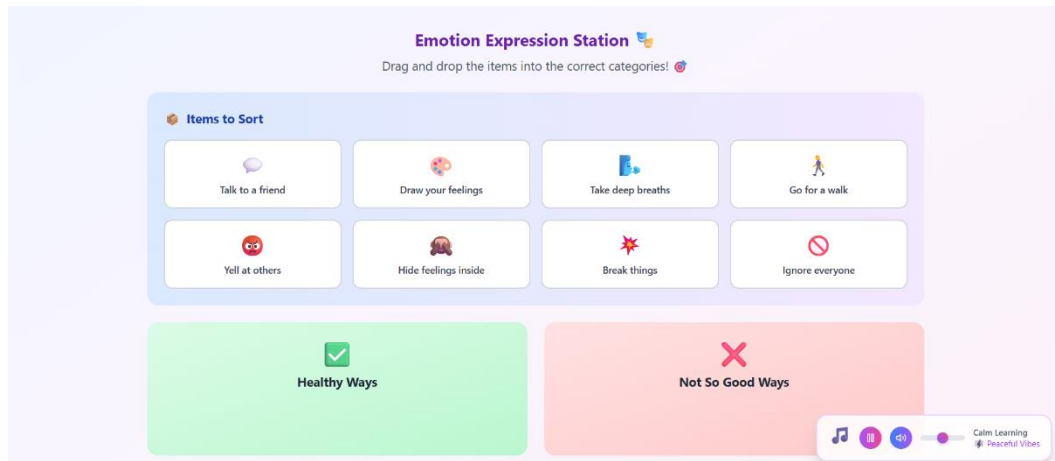


Figure 4. 15 Topics Page 3

The topics page is where all the details of the respective topics are displayed for students to learn and study before taking their quiz to refresh their memories on the knowledge learnt. Then it starts with an avatar introducing the topic to the user as shown in Figure 4.13. This page offers a very simple and concise information for students to understand each topic efficiently (Figure 4.14). Aside from that, it also provides drag drop activities for a more fun session with the student together with music playing in the background (Figure 4.15)

```
const handlePointClick = (point: InfoPoint) => {
  setSelectedPoint(point);
  const newViewedPoints = new Set(viewedPoints);
  newViewedPoints.add(point.id);
  setViewedPoints(newViewedPoints);

  if (newViewedPoints.size === infoPoints.length && onAllPointsViewed) {
    setTimeout(() => onAllPointsViewed(), 1000);
  }
};
```

Figure 4. 16 Code Snippet for Topics Page 1

This code snippet shown in Figure 4.16 defines the `handlePointClick` function, which is triggered when a user clicks on an info point within the infographic component. When a point is clicked, it becomes the currently selected point (`setSelectedPoint`), and its ID is added to the `viewedPoints` set to track user progress. If the number of viewed points matches the total number of `infoPoints`, it implies the user has explored all areas. In that case, the optional callback function `onAllPointsViewed` is triggered after a short delay. This logic enables dynamic engagement and feedback by visually tracking progress through the infographic and rewarding the user once all educational touchpoints have been explored.

```
const handleDragStart = (item: DragDropItem) => {  
  setDraggedItem(item);  
};  
  
const handleDragOver = (e: React.DragEvent<HTMLDivElement>) => {  
  e.preventDefault();  
};
```

Figure 4. 17 Code Snippet for Topics Page 2

```

const handleDrop = (e: React.DragEvent<HTMLDivElement>, zoneId: string) => {
  e.preventDefault();
  if (!draggedItem) return;

  const zone = zones.find((z: DragDropZone) => z.id === zoneId);
  if (!zone || !zone.acceptedCategories.includes(draggedItem.category)) {
    // Wrong drop - animate rejection
    return;
  }

  // Add item to zone
  setDroppedItems(prev => ({
    ...prev,
    [zoneId]: [...(prev[zoneId] || []), draggedItem]
  }));

  // Remove from available items
  setAvailableItems(prev => prev.filter(item => item.id !== draggedItem.id));
  setDraggedItem(null);

  // Check if activity is complete
  const newDroppedItems = {
    ...droppedItems,
    [zoneId]: [...(droppedItems[zoneId] || []), draggedItem]
  };

  const totalDropped = Object.values(newDroppedItems).reduce((sum, items) => sum + items.length, 0);
  if (totalDropped === items.length) {
    setIsComplete(true);
    onComplete(true);
  }
};

```

Figure 4. 18 Code Snippet for Topics Page 3

The two functions in Figure 4.17, handles the essential events required for implementing a drag-and-drop interface. The `handleDragStart` function is triggered when a user begins dragging an item and it updates the component's state by setting `draggedItem` to the item being dragged, allowing the app to keep track of what's currently in motion. The `handleDragOver` function is called whenever a dragged item is moved over a valid drop zone. By default, most HTML elements do not allow dropping; calling `e.preventDefault()` enables the drop event to occur by preventing the browser's default behavior. Together, these handlers enable smooth dragging functionality in the activity.

Based on Figure 4.18, the code handles the core functionality of the drag-and-drop activity, specifically what happens when an item is dropped into a zone. When a user drops an item, the function first checks if a valid item is being dragged and whether it matches the accepted category of the target zone. If the drop is valid, the item is added to the respective zone's list in `droppedItems`, and it's removed from `availableItems` to prevent duplication. It also clears the current `draggedItem` state. The function then constructs a new object representing the updated state of dropped items and calculates if all items have been correctly categorized. If so, it sets the activity as complete and triggers the `onComplete` callback. This logic ensures real-time feedback and interaction in the drag-and-drop learning game.

4.3.6 Quiz Page

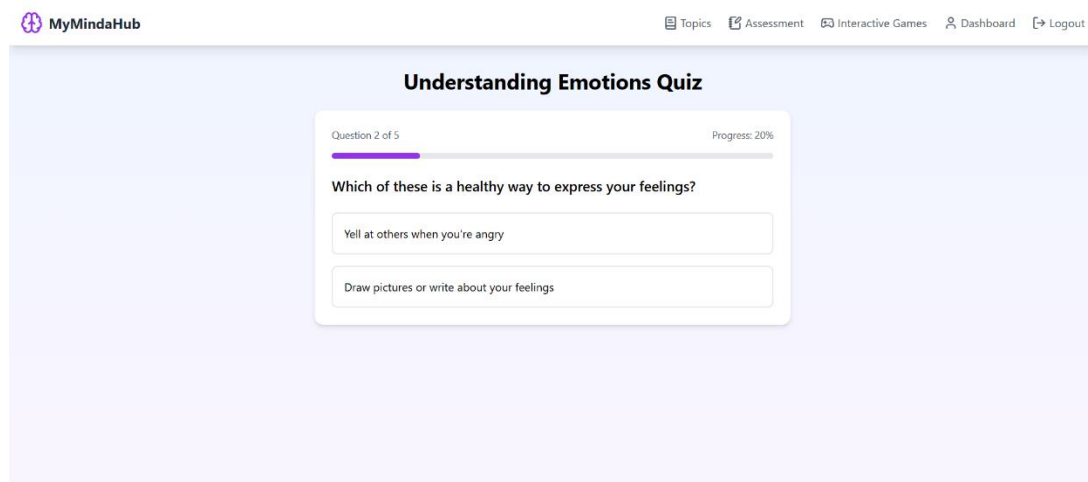


Figure 4. 19 Quiz Page 1

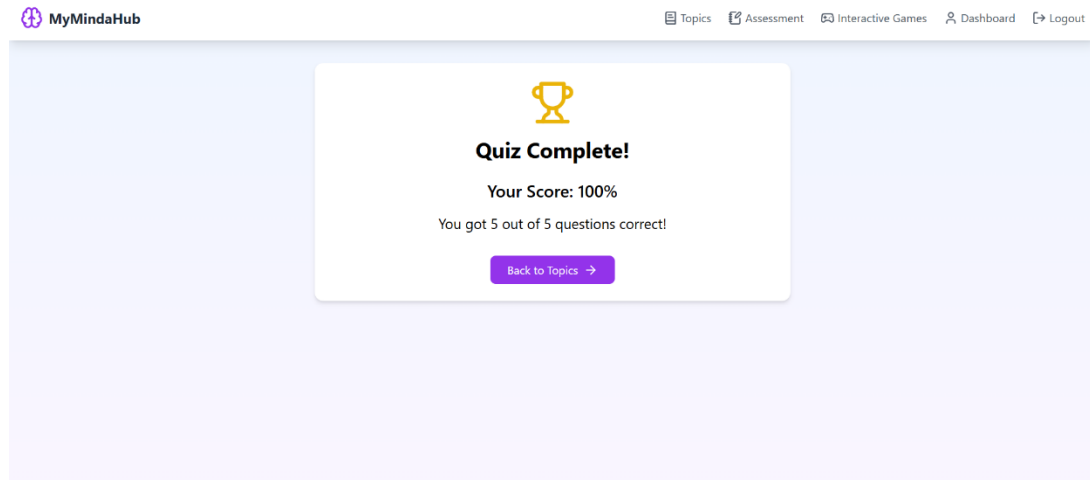


Figure 4. 20 Quiz Page 2

The Quiz page is where the students conduct their short and quick 5 question quiz based on the respective topic to rehash their study on mental health through active learning (Figure 4.19). Once, completing the quiz the student is able to view how many questions were right and the score such as “100%” as shown in Figure 4.20.

```

const calculateResults = async (answers: number[]) => {
  const correctAnswers = answers.reduce((count, answer, index) => {
    return count + (answer === quiz.questions[index].correctAnswer ? 1 : 0);
  }, 0);

  // --- Update student progress in Supabase ---
  const prevProgress = studentProgress[0] || {};
  const prevTopicProgress = prevProgress.topic_progress || {};
  const prevAssessmentResults = prevProgress.assessment_results || {};

  // Merge new topic progress
  const updatedTopicProgress = {
    ...prevTopicProgress,
    [topicId]: {
      completed: true,
      quizScore: (correctAnswers / quiz.questions.length) * 100
    }
  };

  if (student_id) {
    await updateStudentProgress(student_id, updatedTopicProgress, prevAssessmentResults);
    await fetchStudentProgress(student_id);
  }

  setIsSaving(true);
  setSaveError(null);

  // Save quiz result to quiz_results table
  const { error } = await supabase.from('quiz_results').insert([
    {
      student_id,
      topic_id: topicId,
      score_percentage: ((correctAnswers / quiz.questions.length) * 100).toFixed(2),
      correct_answers: correctAnswers,
      total_questions: quiz.questions.length,
      selected_answers: answers // --- store the array
    }
  ])
}

```

Figure 4. 21 Code Snippet for Quiz Page

In figure 4.21, the `calculateResults` function is an asynchronous function that processes a student's answers after completing a quiz. It begins by calculating the number of correct answers using the `reduce` method, comparing each selected answer to the correct one defined in the quiz data. From this, it derives the student's score percentage by dividing the correct answers by the total number of questions and multiplying by 100. Next, the function accesses the user's previous progress data stored in the local state, including any existing topic progress and assessment results. It then creates an updated progress object by marking the current topic as completed and storing the newly calculated quiz score. If the user is logged in (`currentUser?.id`), the function proceeds to update the student's progress in the local store using `updateStudentProgress` and then fetches the latest progress using `fetchStudentProgress` to keep the state in sync. After that, the function attempts to persist the quiz result to the `quiz_results` table in the Supabase database, saving details

such as student ID, topic ID, score, number of correct answers, total questions, and the selected answers. During this operation, it sets a saving state flag to true and resets any previous save errors. If the insertion is successful, it turns off the saving flag; otherwise, it sets an error message to notify the user that saving the quiz result failed. This function ensures both real-time app feedback and long-term storage of quiz results for tracking student performance.

4.3.7 Assessment Page

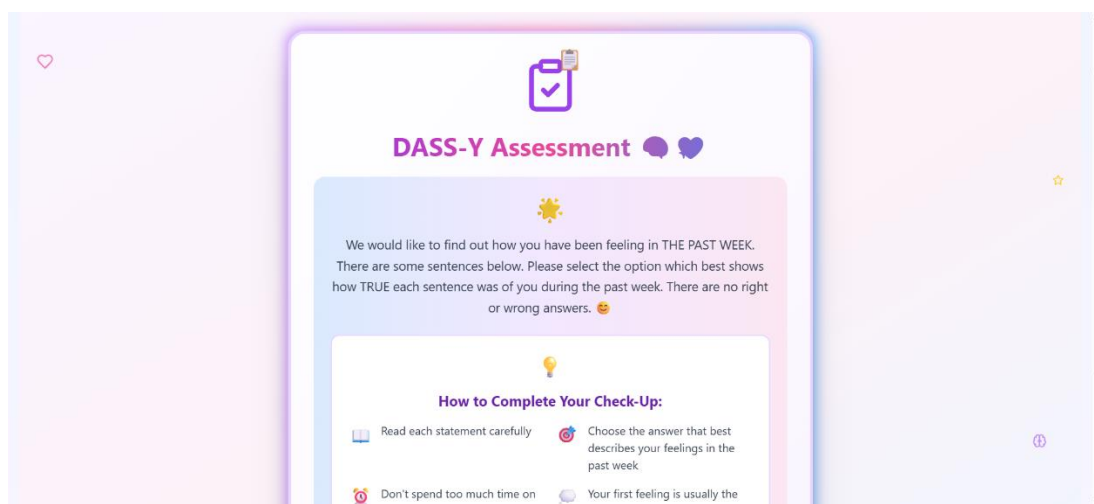


Figure 4. 22 Assessment Page 1

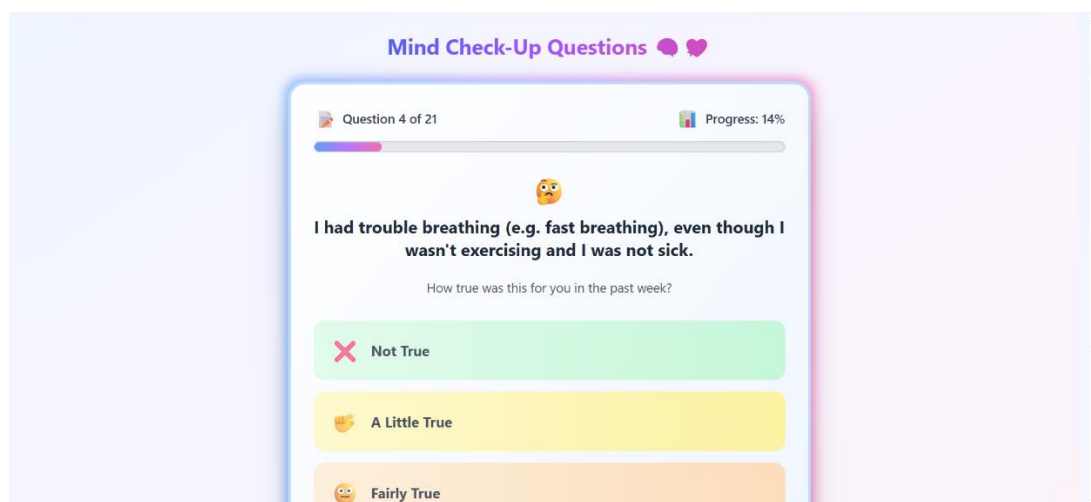


Figure 4. 23 Assessment Page 2

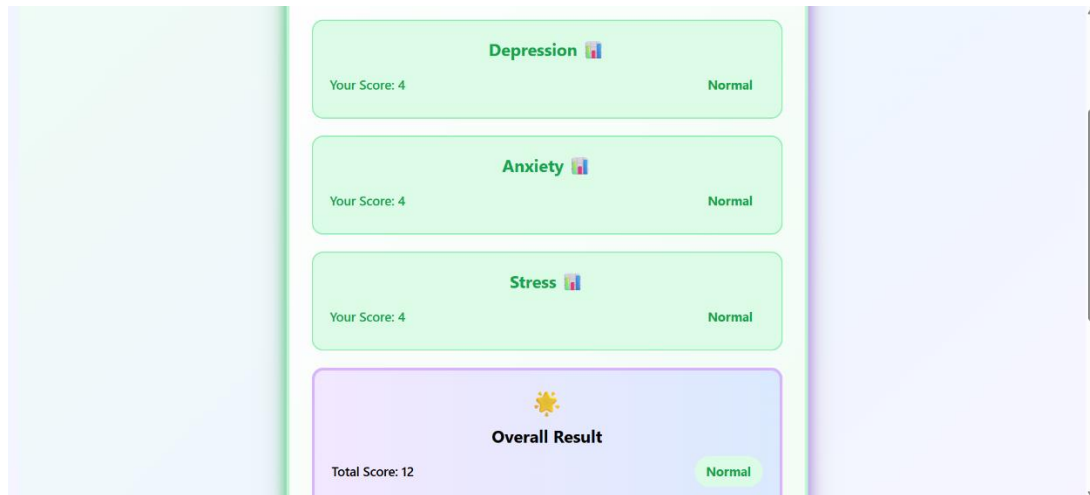


Figure 4. 24 Assessment Page 3

The student can conduct the assessment design specifically to help identify student's well-being (Figure 4.22). The Depression Anxiety Stress Scales – Youth version (DASS-Y) is a version of the DASS-21 specifically designed for youth aged 7-18 years to measure general psychological distress and the negative emotional states of depression, anxiety and stress by answering “Not True”, “A Little True”, “Fairly True” and “Very True” as shown in Figure 4.23. After, answering all the 21 questions the student will be able to view the results (Figure 4.24).

```

const calculateScores = () => {
  const scores = {
    depression: 0,
    anxiety: 0,
    stress: 0,
  };

  Object.entries(scaleMapping).forEach(([scale, items]) => {
    scores[scale as keyof typeof scores] = items.reduce((sum, questionNum) => {
      return sum + (answers[questionNum - 1] || 0);
    }, 0);
  });

  return scores;
};

const handleStartAssessment = () => {
  if (!currentUser) {
    navigate('/login');
    return;
  }
  setStarted(true);
};

```

Figure 4. 25 Code Snippet for Assessment Page 1

```

const handleAnswer = async (value: number) => {
  const newAnswers = [...answers];
  newAnswers[currentQuestion] = value;
  setAnswers(newAnswers);

  if (currentQuestion < TOTAL_QUESTIONS - 1) {
    setCurrentQuestion(currentQuestion + 1);
  } else {
    // Calculate scores
    const scores = calculateScores();

    // --- Update student_progress in Supabase ---
    const prevProgress = studentProgress[0] || {};
    const prevTopicProgress = prevProgress.topic_progress || {};
    const prevAssessmentResults = prevProgress.assessment_results || {};

    // Store full assessment result (completed, responses, date, scores)
    const updatedAssessmentResults = {
      ...prevAssessmentResults,
      'dass-y': {
        completed: true,
        responses: newAnswers,
        date: new Date().toISOString(),
        scores
      }
    };
  };
};

```

Figure 4. 26 Code Snippet for Assessment Page 2

```

if (currentUser?.id) {
  await updateStudentProgress(currentUser.id, prevTopicProgress, updatedAssessmentResults);
  await fetchStudentProgress(currentUser.id);

  // --- Insert into assessment_result table ---
  const depression_level = getScoreInterpretation(scores.depression, 'depression').toLowerCase();
  const anxiety_level = getScoreInterpretation(scores.anxiety, 'anxiety').toLowerCase();
  const stress_level = getScoreInterpretation(scores.stress, 'stress').toLowerCase();
  const total_score = scores.depression + scores.anxiety + scores.stress;
  const total_level = getScoreInterpretation(total_score, 'total').toLowerCase();

  await supabase.from('assessment_result').insert([
    {
      student_id: currentUser.id,
      depression_score: scores.depression,
      depression_level,
      anxiety_score: scores.anxiety,
      anxiety_level,
      stress_score: scores.stress,
      stress_level,
      total_score,
      total_level
    }
  ]);

  setShowResults(true);
}
};

```

Figure 4. 27 Code Snippet for Assessment Page 3

The assessment page logic is designed to evaluate a user's mental health status based on their responses to the DASS-Y questionnaire, which includes 21 questions related to depression, anxiety, and stress. Based on Figure 4.26, when a user selects an answer, the `handleAnswer` function updates their response and moves to the next question. Once all questions are answered, the `calculateScores` function computes individual scores for each category by summing the responses linked to specific question IDs defined in `scaleMapping` as shown in Figure 4.25. These scores are then interpreted into severity levels such as Normal, Mild, Moderate, Severe and Extremely Severe using the `getScoreInterpretation` function, which references the `severityRanges` (Figure 4.27). The results are stored locally in the user's progress state and also saved remotely in the `assessment_result` table on Supabase for future reference. This logic ensures accurate score calculation, categorization of severity, and secure data storage, providing users with instant feedback and helping educators or counselors track students' emotional well-being over time.

4.3.8 Student Dashboard

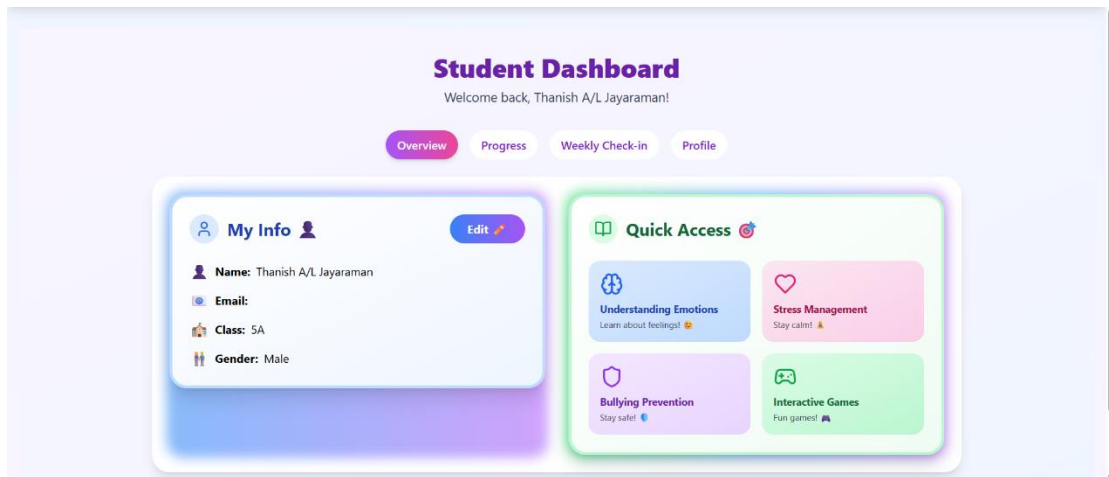


Figure 4. 28 Student Dashboard Page 1



Figure 4. 29 Student Dashboard Page 2

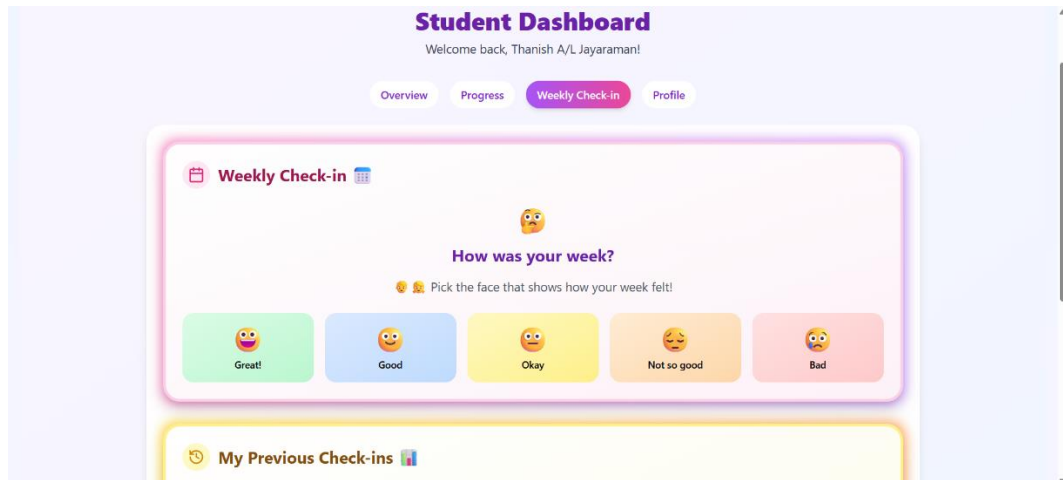


Figure 4. 30 Student Dashboard Page 3

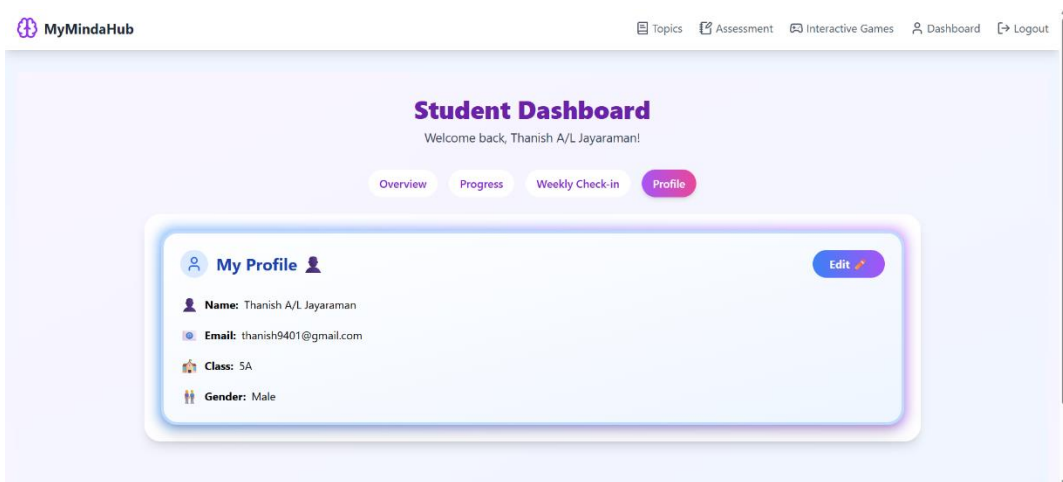


Figure 4. 31 Student Dashboard Page 4

The student dashboard shows “My Info” and provide “Quick Access” as shown in Figure 4.28. The student dashboard is where students can view their personal information and also edit the updated details as well as shown in Figure 4.31. Aside from that, they can also perform the weekly-check in for them to keep track of their feelings and state of mind (Figure 4.30). Students

can also view their learning progress by viewing their topic, quiz and assessment completion (Figure 4.29).

```
const submitCheckIn = async () => {
  if (!currentUser?.id) return;
  const { data, error } = await supabase.from('weekly_checkins').insert([
    {
      student_id: currentUser.id,
      week_feeling: checkInAnswers.weekFeeling,
      main_emotions: checkInAnswers.mainEmotions,
      helpful_things: checkInAnswers.helpfulThings,
      had_issues: checkInAnswers.hadIssues,
      issue_description: checkInAnswers.issueDescription,
      needs_help: checkInAnswers.needsHelp
    }
  ]);
};
```

Figure 4. 32 Code Snippet for Student Dashboard Page (Weekly Check – In) 1

```
if (error) {
  console.error('✖ Error saving check-in:', error.message);
} else {
  // Refetch check-ins after successful submission
  const { data: newData, error: fetchError } = await supabase
    .from('weekly_checkins')
    .select('*')
    .eq('student_id', currentUser.id)
    .order('created_at', { ascending: false });
  if (!fetchError && newData) {
    setPreviousCheckIns(newData.map((row: any) => ({
      date: row.created_at,
      weekFeeling: row.week_feeling,
      mainEmotions: row.main_emotions,
      helpfulThings: row.helpful_things,
      hadIssues: row.had_issues,
      issueDescription: row.issue_description,
      needsHelp: row.needs_help
    })))));
  }
};
```

Figure 4. 33 Code Snippet for Student Dashboard Page (Weekly Check – In) 2

Based on Figure 4.32, the `submitCheckIn` function is a core part of the student dashboard's weekly check-in feature. It executes when the user completes their self-assessment and clicks the final "Done" button. First, it checks if the current user is authenticated (`currentUser?.id`). If not, it aborts. Then, using Supabase's `.insert()` method, it stores the user's responses (like week feeling, emotions, helpful factors, issues, etc.) into the `weekly_checkins` table. If there's an error during this insertion, it logs the error. If the insertion is successful, it re-fetches the updated list of check-ins using `.select()` and `.eq()` (to filter by the student's ID), ensuring the UI reflects the latest data. The `setPreviousCheckIns()` function then updates the local state, allowing the UI to show the most recent check-ins in reverse chronological order (Figure 4.33). This ensures real-time data integrity between the UI and the backend. This logic connects the emotional check-in experience directly to persistent storage, making it possible to analyze trends and review history, which is especially important for applications related to mental health.

```

const ProgressTracker = () => {
  const { currentUser, fetchStudentProgress } = useStore();
  const [quizResults, setQuizResults] = useState<any[]>([]);
  const [assessmentResult, setAssessmentResult] = useState<any>(null);
  const [loading, setLoading] = useState(true);

  // Fetch progress, quiz results, and assessment result on mount or user change
  useEffect(() => {
    const fetchAllProgress = async () => {
      if (!currentUser?.id) return;
      setLoading(true);
      await fetchStudentProgress(currentUser.id);

      // Fetch quiz results for this student
      const { data: quizData } = await supabase
        .from('quiz_results')
        .select('*')
        .eq('student_id', currentUser.id);

      setQuizResults(quizData || []);

      // Fetch latest assessment result for this student
      const { data: assessmentData } = await supabase
        .from('assessment_result')
        .select('*')
        .eq('student_id', currentUser.id)
        .order('created_at', { ascending: false })
        .limit(1)
        .single();

      setAssessmentResult(assessmentData || null);
      setLoading(false);
    };
  });
};

```

Figure 4. 34 Code Snippet for Student Dashboard (Progress Tracker) 1

```

    fetchAllProgress();
  }, [currentUser, fetchStudentProgress]);

  // Get current user's progress
  const userProgress = useStore.getState().studentProgress[0];

  // Helper: get quiz score for a topic
  const getQuizScore = (topicId: string) => {
    const quiz = quizResults.find(q => q.topic_id === topicId);
    return quiz ? Number(quiz.score_percentage) : null;
  };

  // A topic is "Learned" if a quiz has been attempted for it
  const isTopicLearned = (topicId: string) => quizResults.some(q => q.topic_id === topicId);
  const isQuizCompleted = (topicId: string) => getQuizScore(topicId) !== null;

```

Figure 4. 35 Code Snippet for Student Dashboard (Progress Tracker) 2

The provided code snippet in Figure 4.34 defines a functional component called `ProgressTracker`, which is responsible for displaying a student's learning and quiz progress in the student dashboard. It uses state hooks to manage `quizResults`, `assessmentResult`, and a loading indicator. When the component mounts or the current user changes, the `useEffect` hook triggers a function that fetches the student's topic progress, quiz results from the `quiz_results` table, and the most recent entry from the `assessment_result` table in Supabase. The component then determines if a topic has been "learned" by checking whether any quiz result exists for that topic, and if a quiz has been "completed" by checking if a valid score is available. These helper functions (`getQuizScore`, `isTopicLearned`, and `isQuizCompleted`) are used to calculate and display the student's progress across different learning topics (Figure 4.35).

4.3.9 Admin Dashboard

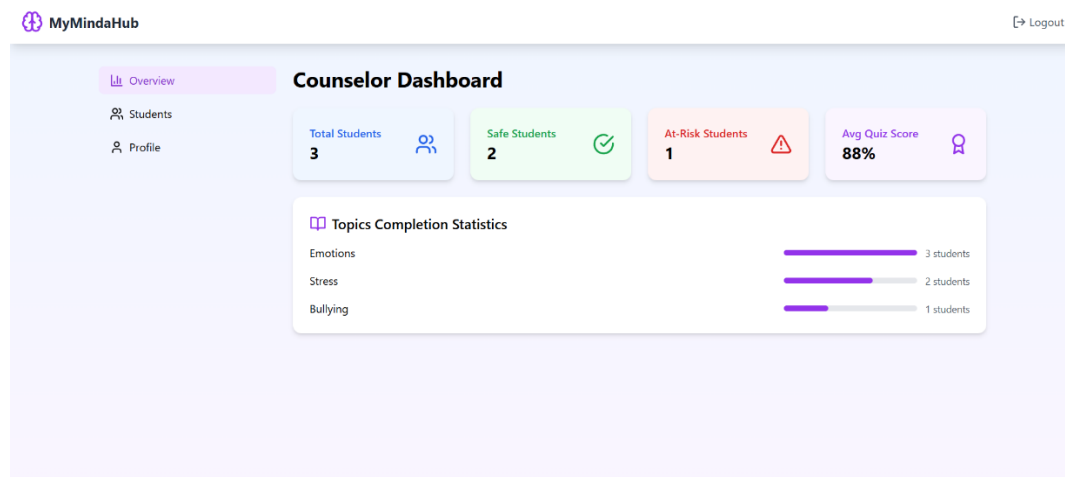


Figure 4. 36 Admin Dashboard Page 1

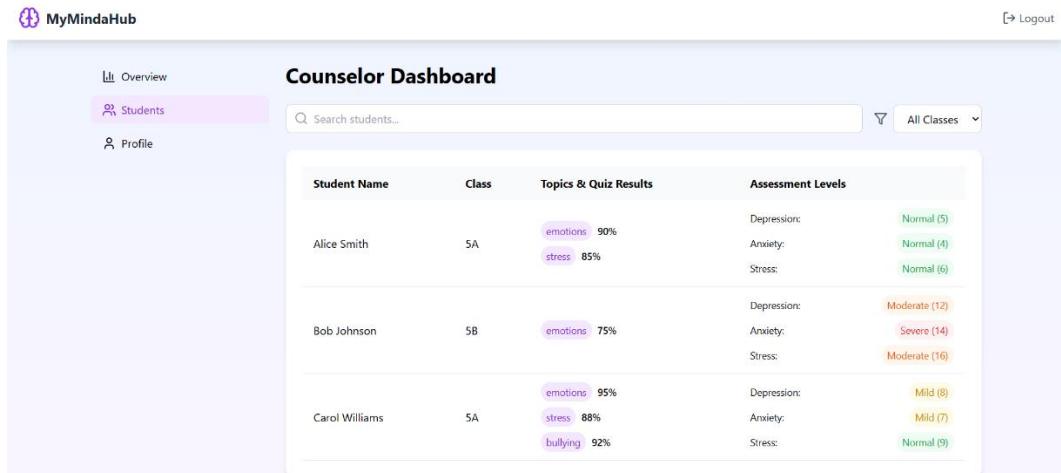


Figure 4. 37 Admin Dashboard Page 2

The admin dashboard acts as a point for counselor to view and get report on their students which required immediate attention (Figure 4.37). Hence, this helps admin to understand the total number of students, safe students and at-risk students in the school as shown in Figure 4.36. With this information, counselor can intervene as soon as possible. Aside from that the admin can also view the student details on the topics done and quiz scores.

```

const calculateStatistics = () => {
  const totalStudents = students.length;
  let safeStudents = 0;
  let atRiskStudents = 0;
  let totalQuizScore = 0;
  let totalQuizzes = 0;
  const topicsStats: Record<string, number> = {};

  students.forEach(student => {
    const assessment = getStudentAssessment(student.id);
    if (assessment) {
      const isSafe =
        ['normal', 'mild'].includes(assessment.depression_level) &&
        ['normal', 'mild'].includes(assessment.anxiety_level) &&
        ['normal', 'mild'].includes(assessment.stress_level);
      if (isSafe) safeStudents++;
      else atRiskStudents++;
    }
    const quizzes = getStudentQuizResults(student.id);
    quizzes.forEach(q => {
      totalQuizScore += Number(q.score_percentage);
      totalQuizzes++;
      topicsStats[q.topic_id] = (topicsStats[q.topic_id] || 0) + 1;
    });
  });

  return {
    totalStudents,
    safeStudents,
    atRiskStudents,
    averageQuizScore: totalQuizzes > 0 ? Math.round(totalQuizScore / totalQuizzes) : 0,
    topicsStats,
  };
};

```

Figure 4. 38 Code Snippet for Admin Dashboard Page

The calculateStatistics function in the admin dashboard is responsible for analyzing student data to generate key performance and wellbeing metrics as shown in Figure 4.38. It processes the list of students to determine the total number of students, how many are considered "safe" (with mental health levels of *normal* or *mild*), and how many are "at-risk" based on their latest assessment results for depression, anxiety, and stress. Additionally, it calculates the average quiz score across all students and compiles topic-specific quiz participation statistics. These insights are returned as a structured object and later used to populate the Overview tab of the dashboard, providing counselors with a clear summary of student wellbeing and learning progress at a glance.

4.4 Finding

The capacity of hierarchical architecture to divide a complex system into manageable and intelligible parts is one of its main advantages. The system itself, which includes every other module, is the top-level module in this instance. The overall structure and coordination of the complete software system are provided by this top-level system module. Login, Sign Up, Home Page, Topics Page, Quiz Page, Assessment Page, Student Dashboard Page and Admin Dashboard Page are the eight modules that make up the MyMindaHub System.

The first two modules, Login and Sign Up, are responsible for handling user authentication and registration. These modules play a significant role in ensuring that only authorized users can access the MyMindaHub system and that new users can create accounts. By separating these functionalities into dedicated modules, it becomes easier to manage user access and security.

The Home Page serves as a user-friendly navigation hub, offering clear and concise access to key features. It is designed to balance functionality and visual clarity, helping users efficiently locate and interact with the platform's core modules.

The topics page provides structured, easy-to-understand educational content across selected mental health topics. Its layout is simplified to suit the reading and comprehension level of Year 5 students, ensuring effective knowledge acquisition before they engage with related quizzes.

The quiz module allows students to reinforce their learning through a set of five topic-specific questions. With immediate feedback and scoring, this feature supports active learning and helps students self-evaluate their understanding of mental health concepts.

The assessment module features the DASS-Y questionnaire, enabling students to complete a 21-question survey measuring depression, anxiety, and stress. The system automatically classifies responses into severity levels, facilitating early identification of students who may require further support.

This student module empowers students to manage their profile details and conduct weekly emotional check-ins. It supports emotional awareness and growth by allowing students to reflect on their mental state over time through a personalized dashboard whereas the admin dashboard is designed for counselors, to offer critical insights into student well-being through risk-level categorization and progress tracking. It facilitates early intervention by allowing counselors to filter and identify students who may need immediate support and monitor academic engagement across modules.

4.5 Summary

An overview of the project's development process and tools is given in Chapter 4 of the implementation project. After introducing the software used during the development period, the chapter talks about the MyMindaHub System prototype. The various parts and their interconnections are highlighted in the system hierarchy based on modules. The chapter concludes by analysing the implementation decisions and their ramifications in the discussion section. A thorough description of the implementation process is given in Chapter 4, which also presents the system prototype, describes the software utilised, and offers insights into particular modules.

CHAPTER 5: TESTING

5.1 Introduction

Testing is a critical phase in software development that ensures the application meets its specified requirements and functions correctly under various conditions. This chapter presents the comprehensive testing plan for the proposed web application, encompassing both functional and non-functional testing methodologies.

The testing phase validates system performance, identifies potential defects, ensures user requirements are met, and verifies system reliability. A systematic testing approach was implemented to evaluate all aspects of the web application, from individual component functionality to overall system usability and user acceptance.

5.2 Functional Testing

5.2.1 Test Case Overview

Functional testing validates that the MyMindaHub web application performs its intended functions correctly according to the specified requirements. This testing focuses on verifying user interactions, data processing, navigation flows, and feature functionality across different user roles (students and counselors). The testing covers core features including Sign Up, Login, Topics Page, Quiz Page, Assessment Page, and User Profile Edit.

5.2.1.1 Test Cases for Proposed Mobile Application

This section outlines the comprehensive test cases created to assess the functionality and reliability of the proposed system. Each test case is derived from the system's requirements and anticipated user interactions, aiming to ensure that every module functions correctly under different scenarios. Functional testing was carried out to confirm that all features behave as specified and align with user expectations. The test cases encompass various system modules and user roles to evaluate input validation, system behavior, and the overall user experience.

Table 5. 1 Sign up Module Test Plan.

Module Name	Sign Up					
Test Case Description	Testing sign up functionality in MyMindaHub system.					
Testing Objective	To test the functionality of the sign-up module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)

SU_01	Valid student Sign up	1. Navigate to registration page 2. Enter valid full name 3. Enter unique username 4. Enter strong password 5. Select gender 6. Select class 7. Click "Create My Account"	Full name: Thanish A/L Jayaraman Username: Thanish Password: 12345 Gender: Male Class: 5A	User account created successfully and redirected to topics page.	The user account was created successfully and redirects the user to the topics page in the student dashboard.	Pass
SU_02	Sign up with missing required fields	1. Navigate to registration page 2. Leave one or more required	Full name: Thanish A/L Jayaraman Username: “ ”	Form validation errors displayed and registration is unsuccessful.	The form displayed and error message “Please fill out	Pass

		fields empty 3. Click "Create My Account"	Password: 12345 Gender: Male Class: 5A		this field” and the user sign up was unsuccessful.	
SU_03	Sign up with duplicate information	1. Navigate to registration page 2. Enter existing details 3. Click "Create My Account"	Full name: Thanish A/L Jayaraman Username: Thanish Password: 12345 Gender: Male Class: 5A	Error message displayed indicating username already exists	An error message displayed “Username already exist” and the sign up was unsuccessful	Pass

Table 5. 2 Login Module Test Plan.

Module Name	Login					
Test Case Description	Testing login functionality in the MyMindaHub system.					
Testing Objective	To test the functionality of the login module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)
LOG_01	Valid student login	1. Navigate to login page 2. Enter valid username 3. Enter correct password 4. Ensure "Login as Counselor" is unchecked 5. Click "Login"	1. Username: Thanish 2. Password: 12345	Student successfully logged in, redirected to topics page	The user (student) was able to successfully login and is redirected to the topics page in the student dashboard.	Pass

LOG_02	Valid counselor login	1. Navigate to login page 2. Enter admin username 3. Enter admin password 4. Check "Login as Counselor" 5. Click "Login"	1. Username: Alex 2. Password: 1234	Counselor successfully logged in, redirected to dashboard	The admin (counselor) was able to successfully login and is redirected to the topics page in the admin dashboard.	Pass
LOG_03	Invalid credentials	1. Navigate to login page 2. Enter invalid username/password 3. Click "Login"	1. Username: Thanish 2. Password: "0000"	Error message displayed and login is unsuccessful.	An error message "Invalid username or password" was displayed and	Pass

					the login was unsuccessful.	
LOG_04	Empty login fields	1. Navigate to login page 2. Leave username and/or password empty 3. Click "Login"	1. Username: Thanish 2. Password: “ ”	Error message displayed and login is unsuccessful.	An error message “Please fill out this field” was displayed and the login was unsuccessful.	Pass
LOG_05	Password visibility toggle	1. Navigate to login page 2. Enter password 3. Click eye icon to toggle visibility	1. Username: Thanish 2. Password: 12345	User able to see the password.	The user was able to see the password typed upon clicking the toggle.	Pass

Table 5. 3 Topics Page Module Test Plan.

Module Name	Topics Page					
Test Case Description	Testing topics functionality in the MyMindaHub system.					
Testing Objective	To test the functionality of the topics module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)
TP_01	Topics page accessibility	1. Login as student 2. Navigate to Topics page 3. Verify all topics are displayed	N/A	All three topics (Emotions, Stress Management, Bullying Prevention) displayed with proper styling.	All three topics was displayed with proper styling.	Pass
TP_02	Topic navigation	1. Navigate to Topics page 2. Click on	N/A	Successfully navigated to topic detail page	The user was able to navigate to the	Pass

		"Understanding Emotions" topic 3. Verify navigation		with correct content	"Understanding Emotions" topic easily.	
TP_03	Topic detail content	1. Click on any topic 2. Verify content sections 3. Check images and text	N/A	All content sections displayed correctly, images load properly, text is readable	All the content was displayed correctly and meets the other requirements.	Pass
TP_04	Guest user access	1. Access site without logging in 2. Navigate to Topics page	N/A	Topics are accessible to guest users, content displays properly	The topics are accessible was the guest view however unable to take the quiz.	Pass

Table 5. 4 Quiz Page Module Test Plan.

Module Name	Quiz Page					
Test Case Description	Testing quiz functionality in the MyMindaHub system.					
Testing Objective	To test the functionality of the quiz module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)
QP_01	Quiz access for logged-in users	1. Login as student 2. Navigate to topic detail 3. Click "Take the Quiz"	N/A	Quiz page loads successfully, first question displayed	The first question of the quiz loads and displays correctly.	Pass
QP_02	Quiz access restriction	1. Access quiz URL without logging in 2. Verify redirection	N/A	User redirected to login page, access denied message shown	The user is unable to access quiz from guest view and if not logged in.	Pass

QP_03	Question progression	1. Start quiz 2. Answer first question 3. Verify automatic progression	N/A	Automatically moves to next question after selection, progress bar updates	Navigates efficiently from one question to another and completes all five questions for each topic.	Pass
QP_04	Answer selection feedback	1. Start quiz 2. Select an answer 3. Observe visual feedback	N/A	Selected answer highlighted, correct/incorrect indication shown	The system highlights green and a “√” on the right answers whereas highlights red and “×” for the wrong answers.	Pass

QP_05	Quiz completion and scoring	1. Complete entire quiz 2. Answer all questions 3. View results	Answer all five questions correctly.	Final score displayed, percentage calculated correctly, completion message shown	The system displays “Quiz Complete! Your”, “Score: 100%” and “You got 5 out of 5 questions correct!”	Pass
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Table 5. 5 Assessment Module Test Plan.

Module Name	Assessment Page					
Test Case Description	Testing assessment functionality in the MyMindaHub system.					
Testing Objective	To test the functionality of the assessment module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)
AP_01	Assessment introduction display	1. Navigate to Assessment page 2. Verify introduction content	N/A	Introduction page displays with clear instructions and engaging design	The page displays the introduction and description clearly.	Pass
AP_02	Assessment start for logged-in users	1. Login as student 2. Navigate to Assessment	N/A	Assessment begins, first question displayed	The first question of the quiz loads and displays correctly.	Pass

		3. Click "Start My Check-Up!"				
AP_03	Assessment access restriction	1. Access assessment without login 2. Click "Start My Check-Up!"	N/A	User redirected to login page	The user is unable to access quiz from guest view and if not logged in.	Pass
AP_04	DASS-Y question progression	1. Start assessment 2. Answer questions sequentially 3. Verify progression	N/A	All 21 questions presented in order, progress bar updates correctly	Navigates efficiently from one question to another and completes all 21 questions.	Pass

AP_05	Response scale functionality	1. Start assessment 2. Test all response options 3. Verify selection	N/A	All four response options (Not True, A Little True, Fairly True, Very True) work correctly	All the response properly and correctly.	Pass
AP_06	Assessment completion and scoring	1. Complete all 21 questions 2. View results page	Random entries in no specific order.	Results displayed with depression, anxiety, stress scores and severity levels	The system displays “Check Up Complete”, “Depression score 13” which is “Moderate”, “Anxiety score 13” which is “Severe” and	Pass

					“Stress score 8” which is “Normal”. The system also shows the “Overall score 34” which is “Moderate”	
AP_07	Results page design	1. Complete assessment 2. Review results presentation	N/A	Results presented in child-friendly manner with appropriate colors and encouraging messages	The system displays the results in a very appealing manner and provide encouraging message.	Pass

Table 5. 6 User Profile Edit Module Test Plan.

Module Name	User Profile Edit					
Test Case Description	Testing the update account functionality in the MyMindaHub system.					
Testing Objective	To test the functionality of the edit profile page module.					
Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)
UP_01	Profile edit access	1. Login as student 2. Navigate to Student Dashboard 3. Locate profile section 4. Click "Edit"	N/A	Profile edit mode activated, form fields become editable	The profile section becomes editable for the user (Student)	Pass
UP_02	Profile information display	1. Navigate to profile section 2. Verify	Name: Thanish A/L Jayaraman	Current user information displayed	The profile information was displayed	Pass

		current information display	Email: thanish1234@gmail.com Class: 5A Gender: Male	correctly (name, email, class, gender)	upon clicking the edit button.	
UP_03	Name field editing	1. Enter edit mode 2. Modify name field 3. Save changes	Name: Charles Email: thanish1234@gmail.com Class: 5A Gender: Male	Name field editable, changes saved successfully, display updated	The name field was modified and updated successfully upon clicking the edit button.	Pass
UP_04	Email field editing	1. Enter edit mode 2. Modify	Name: Charles Email: thanish01@gmail.com	Email field editable, changes saved	The email field was modified and updated	Pass

		email field 3. Save changes	Class: 5A Gender: Male	successfully, display updated	successfully upon clicking the edit button.	
UP_05	Class field editing	1. Enter edit mode 2. Modify class field 3. Save changes	Name: Charles Email: thanish01@gmail.com Class: 5B Gender: Male	Class field editable, changes saved successfully, display updated	The class field was modified and updated successfully upon clicking the edit button.	Pass
UP_06	Gender field editing	1. Enter edit mode 2. Modify gender selection	Name: Charles Email: thanish01@gmail.com Class: 5B	Gender dropdown functional, changes saved successfully,	The gender field was modified and updated successfully	Pass

		3. Save changes	Gender: Female	display updated	upon clicking the edit button.	
UP_07	Save functionality	1. Make multiple changes 2. Click "Save" 3. Verify changes persistence	Name: Max Email: max01@gmail.com Class: 5C Gender: Male	All changes saved successfully, edit mode exits, updated information displayed	All the changes modified and updated successfully upon clicking the edit button.	Pass
UP_08	Counselor profile editing	1. Login as counselor 2. Navigate to profile section 3. Test edit functionality	Name: Thanish Email: thanish01@gmail.com Department: Counselling	Counselor can edit their profile information however the department	The admin (Counselor) was able to edit the profile.	Pass

				field remains disabled		
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5.3 Non – Functional Testing

5.3.1 Overview

Non-functional testing evaluates the performance, usability, reliability, and other quality attributes of the application. This testing ensures the system meets performance requirements and provides an acceptable user experience under various conditions.

The non-functional testing approach includes performance testing, usability testing, reliability testing, and user satisfaction. These tests validate that the application not only functions correctly but also meet quality standards and user expectations.

5.3.2 User Acceptance Testing (UAT)

User Acceptance Testing (UAT) is the final phase of the testing process where real users evaluate the system to ensure it meets their needs and expectations. In this project, UAT was conducted with both students and a school counselor to assess the app's overall functionality and if it meets the requirements that was set initially prior to the development. According to the questionnaires, there are FIVE (5) parts of questions in the questionnaire which are demographic, usability, reliability, performance, and overall user satisfaction. Regarding their opinion of the system, respondents selected one of FIVE (5) options using the Likert Scale approach which are strongly agree, agree, average, disagree, and strongly disagree. Feedback from this testing helps confirm whether the app is functioning as intended and is ready for actual use in an educational setting.

5.3.2.1 Analysis of User Acceptance Survey

5.3.2.1.1 User Acceptance Testing by Student

Part 1: Demographic

Question 1: How old are you?

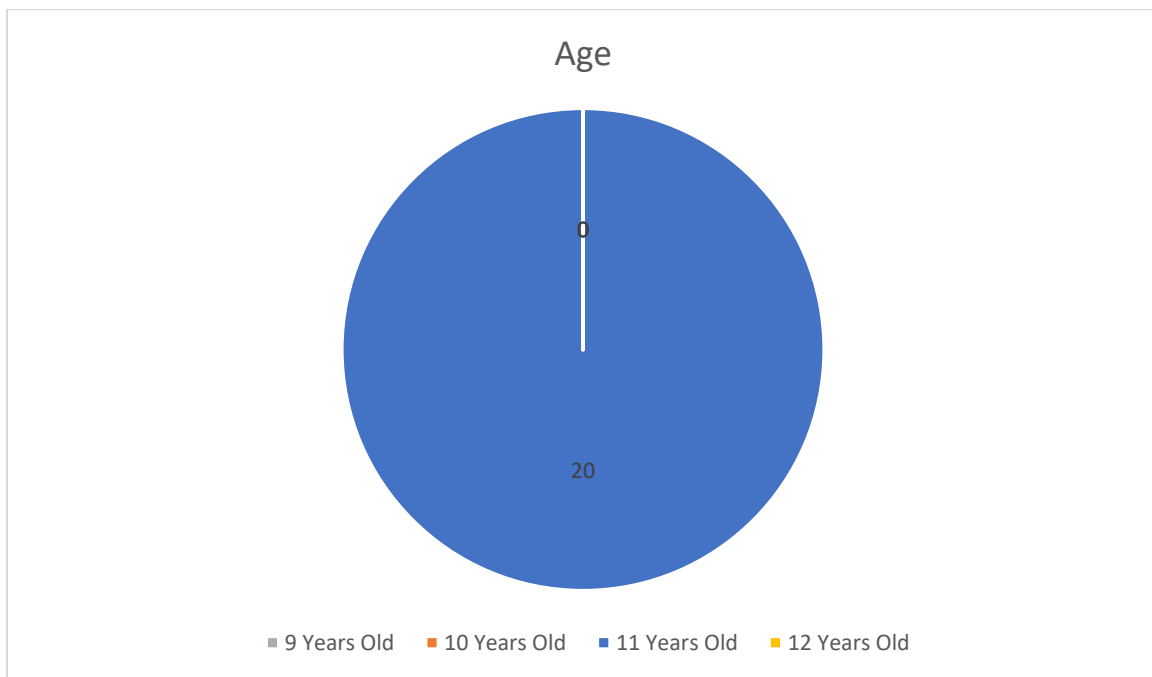


Figure 5. 1 Pie Chart of Students' Age Group for User Acceptance Testing

Based on Figure 5.1, all 20 participants (100%) are Year 5 primary students from Sekolah Kebangsaan Muara Tuang. There were no participants from any other age group. Hence, this consistency in the data reflects that the survey specifically targeted Year 5 students which ensures the responses are relevant and focused on this particular demographic.

Question 2: Are you a boy or girl?

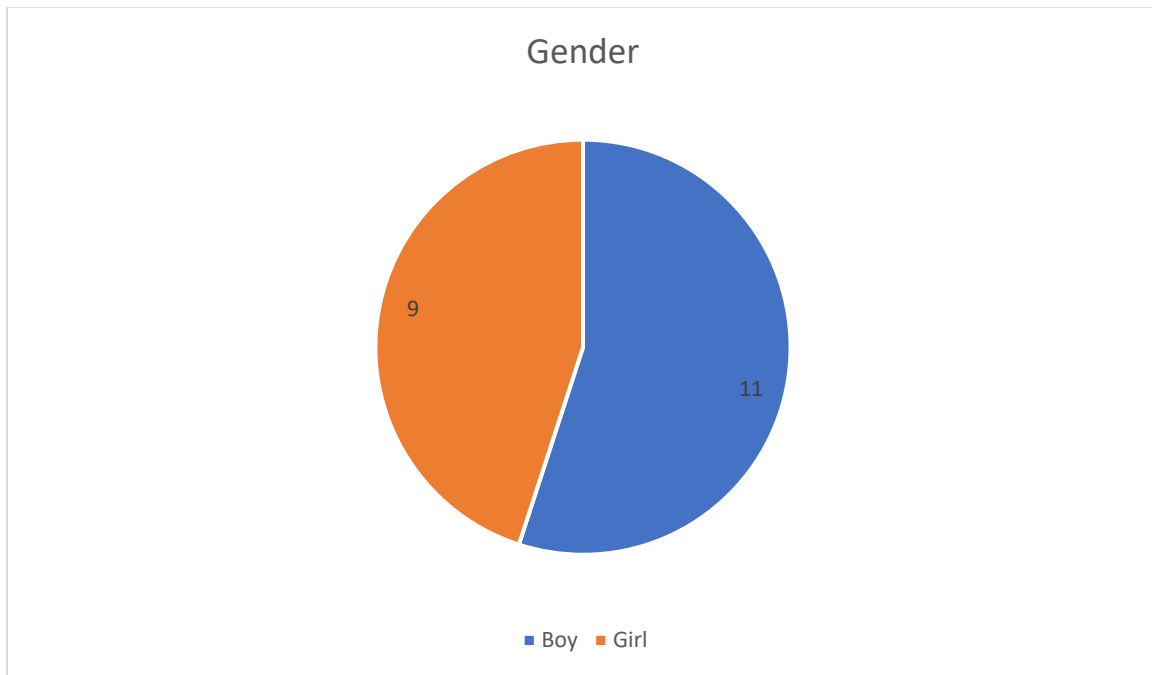


Figure 5. 2 Pie Chart of Students' Gender Distribution for User Acceptance Testing

Based on Figure 5.2, 11 participants are boys, and 9 participants are girls. The highest frequency is 11 (55%) which corresponds to the girls, while the boys have a slightly lower frequency which is 9 (45%). This nearly balanced gender distribution indicates a fairly even representation of boys and girls in the survey, providing a well-rounded perspective from both genders.

Question 3: Race

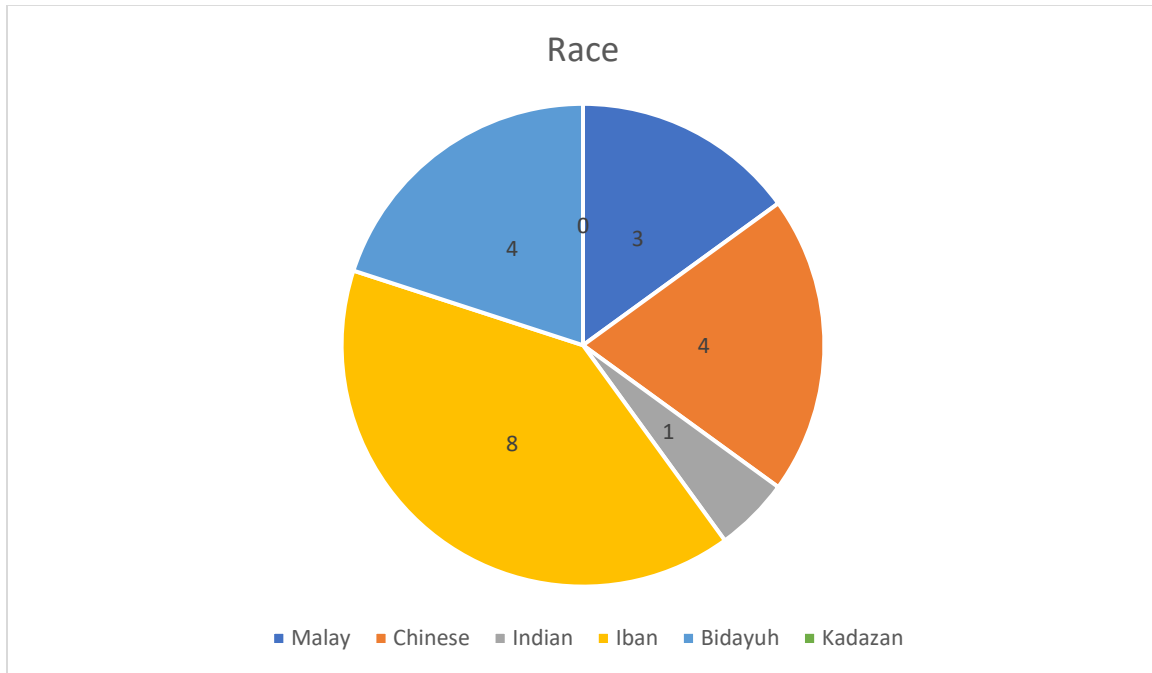


Figure 5. 3 Pie Chart of Students' Racial Composition for User Acceptance Testing

Based on Figure 5.3, the distribution of participants by race is as follows: 3 participants (15%) are Malay, 4 participants (20%) are Chinese, 1 participant (5%) is Indian, 8 participants (40%) are Iban, 4 participants (20%) are Bidayuh, and 0 participants (0%) are Kadazan. The highest frequency (40%) is among Iban students, followed by Chinese and Bidayuh students (20% each). The lowest representation is from Indian (5%) and Kadazan (0%) participants. This data highlights a diverse representation of ethnic backgrounds, with a predominance of Iban students.

Part 2: Usability Testing

Question 4: The app was easy to use

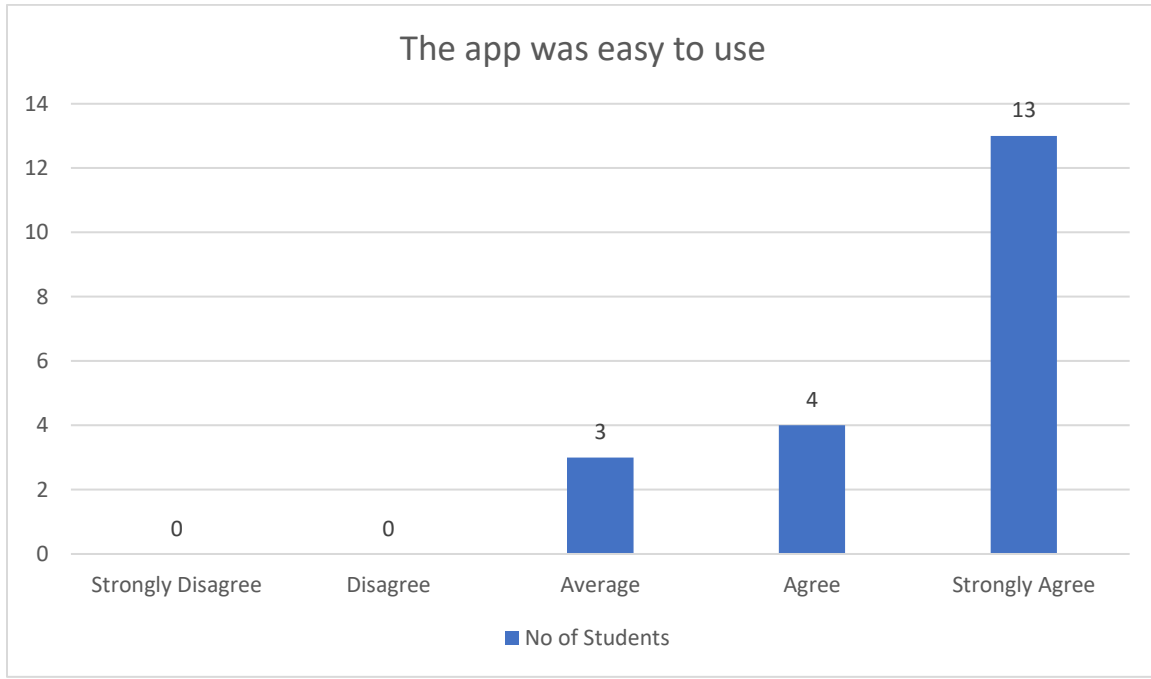


Figure 5. 4 Bar Graph of Students' Response to "The App Was Easy to Use"

Out of 20 students, 13 (65%) selected strongly agree, 4 (20%) selected agree, and 3 (15%) chose average, while none (0%) selected disagree or strongly disagree (Figure 5.4). The highest frequency was 13 students (65%) who strongly agreed, and the lowest was 0 students (0%) for both disagree and strongly disagree. This shows that the app is considered highly user-friendly among the students, with no signs of confusion or frustration. The absence of negative feedback suggests that the interface and overall user experience are well-designed for Year 5 users.

Question 5: I could find what I was looking for quickly

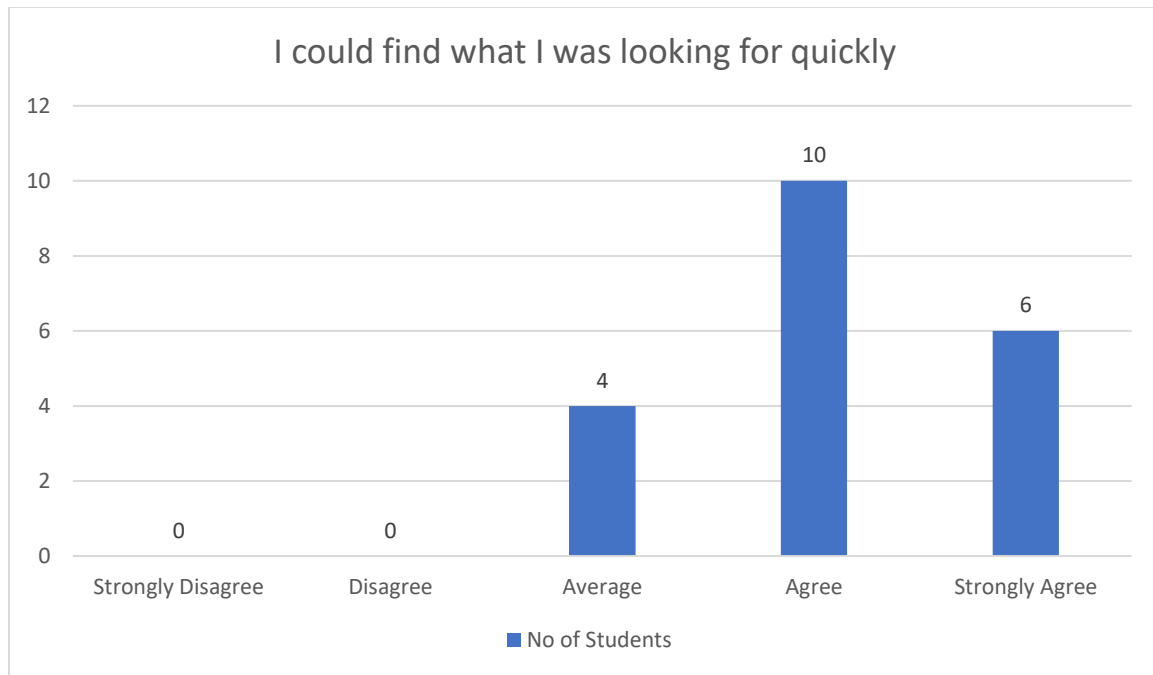


Figure 5. 5 Bar Graph of Students' Response to "I Could Find What I Was Looking for Quickly"

In Figure 5.5, 10 (50%) students selected agree, 6 (30%) chose strongly agree, and 4 (20%) responded with average, while none (0%) chose disagree or strongly disagree. The highest frequency was 10 students (50%) who agreed, and the lowest was 0 students (0%) for both disagree and strongly disagree. The majority of students found the content or features they were searching for without difficulty, indicating that the navigation system and layout of the app are effective. The lack of any negative responses reinforces the app's ease of use and clarity in structure.

Question 6: The buttons and menus were easy to understand

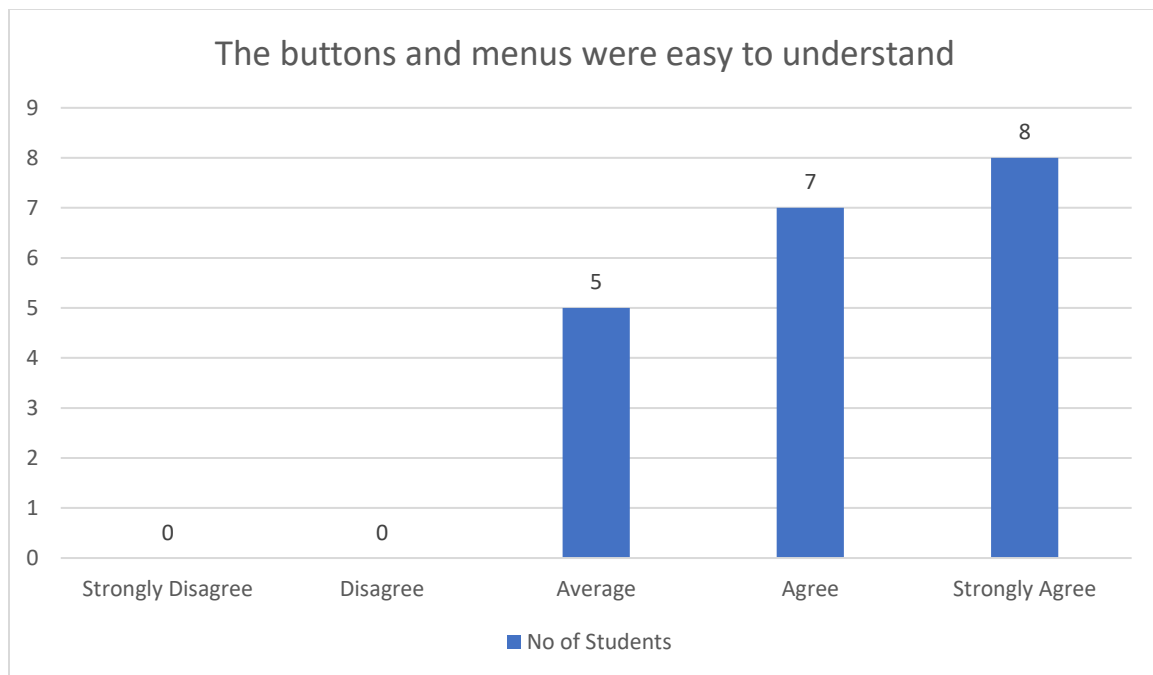


Figure 5. 6 Bar Graph of Students' Response to "The Buttons and Menus Were Easy to Understand"

Responses included 8 (40%) students who strongly agreed, 7 (35%) who agreed, and 5 (25%) who selected average, with no students (0%) selecting disagree or strongly disagree (Figure 5.6). The highest frequency was 8 students (40%) who strongly agreed, and the lowest was 0 students (0%) for both disagree and strongly disagree. While most students found the buttons and menus easy to understand, the presence of 25% rating it as average may suggest that a few users experienced slight uncertainty, possibly due to unfamiliar icons or labeling. A minor adjustment in design clarity could enhance the overall user experience.

Question 7: I learned how to use the app quickly

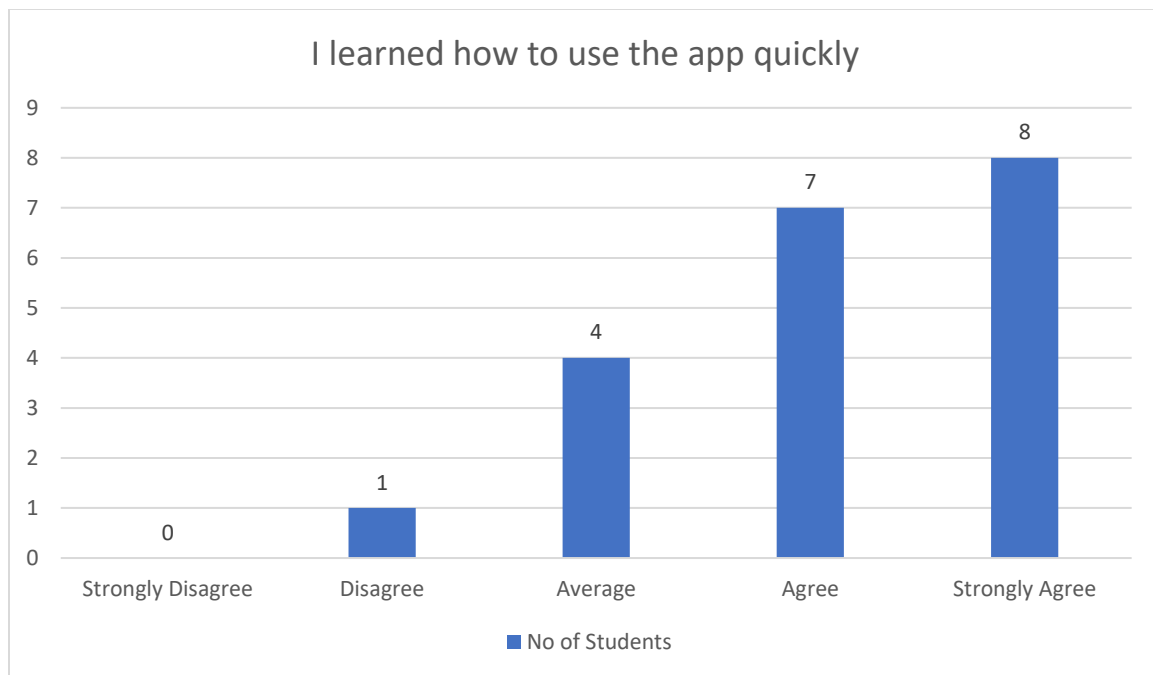


Figure 5. 7 Bar Graph of Students' Response to "I Learned How to Use the App Quickly"

The responses showed 8 (40%) students who strongly agreed, 7 (35%) who agreed, 4 (20%) who chose average, and 1 (5%) student who disagreed (Figure 5.7). The highest frequency was 8 students (40%) who strongly agreed, and the lowest was 1 student (5%) who disagreed. The data indicates that most users adapted to the app quickly, but the presence of one disagreement suggests that not all students found it immediately easy to learn. This could be due to differences in digital familiarity, and it may be helpful to include a simple onboarding or tutorial for first-time users to bridge this gap.

Question 8: The words and instructions were easy to read

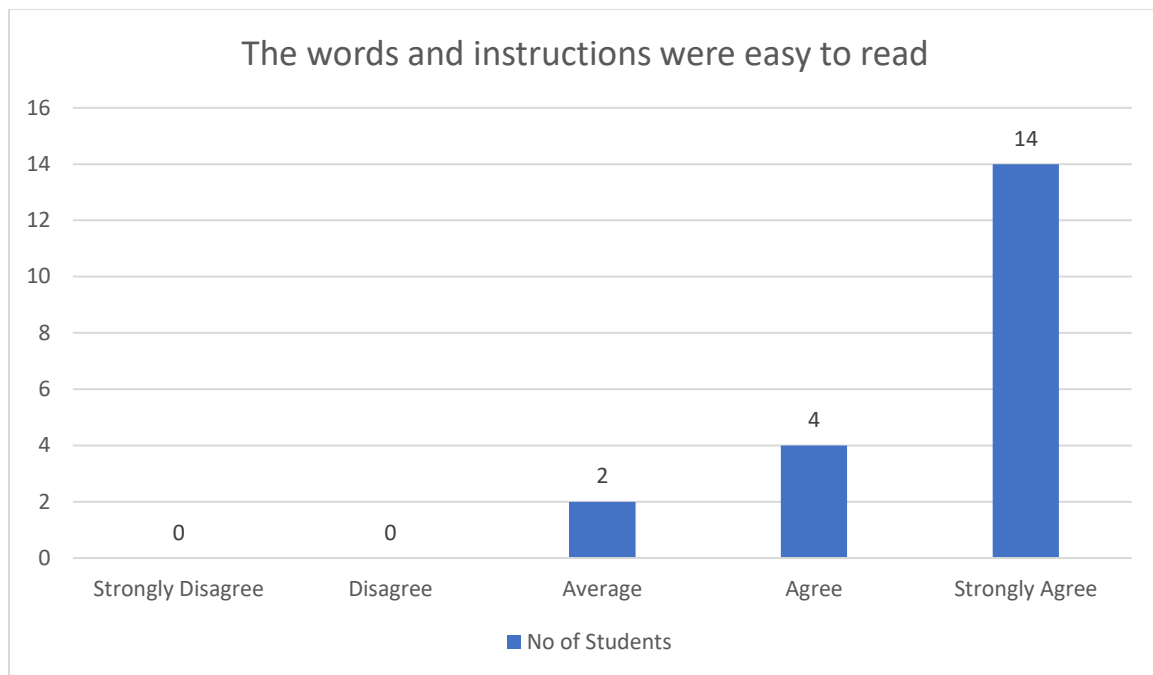


Figure 5. 8 Bar Graph of Students' Response to "The Words and Instructions Were Easy to Read"

A large majority of students, 14 (70%), selected strongly agree, 4 (20%) chose agree, and only 2 (10%) selected average, with no one (0%) selecting disagree or strongly disagree (Figure 5.8). The highest frequency was 14 students (70%) who strongly agreed, and the lowest was 0 students (0%) for both disagree and strongly disagree. This reflects very positively on the app's readability, indicating that the language, font, and instructions are well-suited for Year 5 students. The strong positive response confirms that users were able to clearly understand the app's instructions and information without difficulty.

Question 9: I could easily go back to previous pages

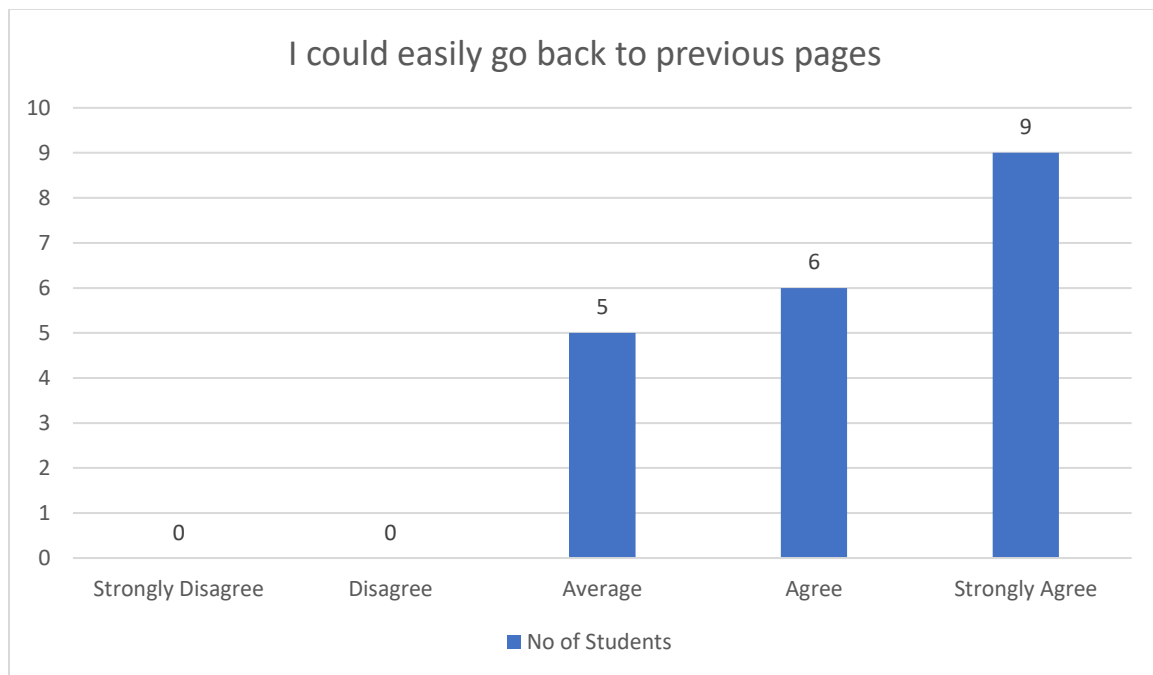


Figure 5.9 Bar Graph of Students' Response to "I Could Easily Go Back to Previous Pages"

In figure 5.9, 9 (45%) students strongly agreed, 6 (30%) agreed, and 5 (25%) selected average, while no one (0%) selected disagree or strongly disagree. The highest frequency was 9 students (45%) who strongly agreed, and the lowest was 0 students (0%) for both disagree and strongly disagree. Most students were able to navigate backward through the app without issue, although the 25% who chose average suggest that the back-navigation function may not have been immediately obvious to everyone. Enhancing the visibility or labeling of this function could help improve navigation clarity for all users.

Part 3: Reliability Testing

Question 10: The app worked properly every time I used it

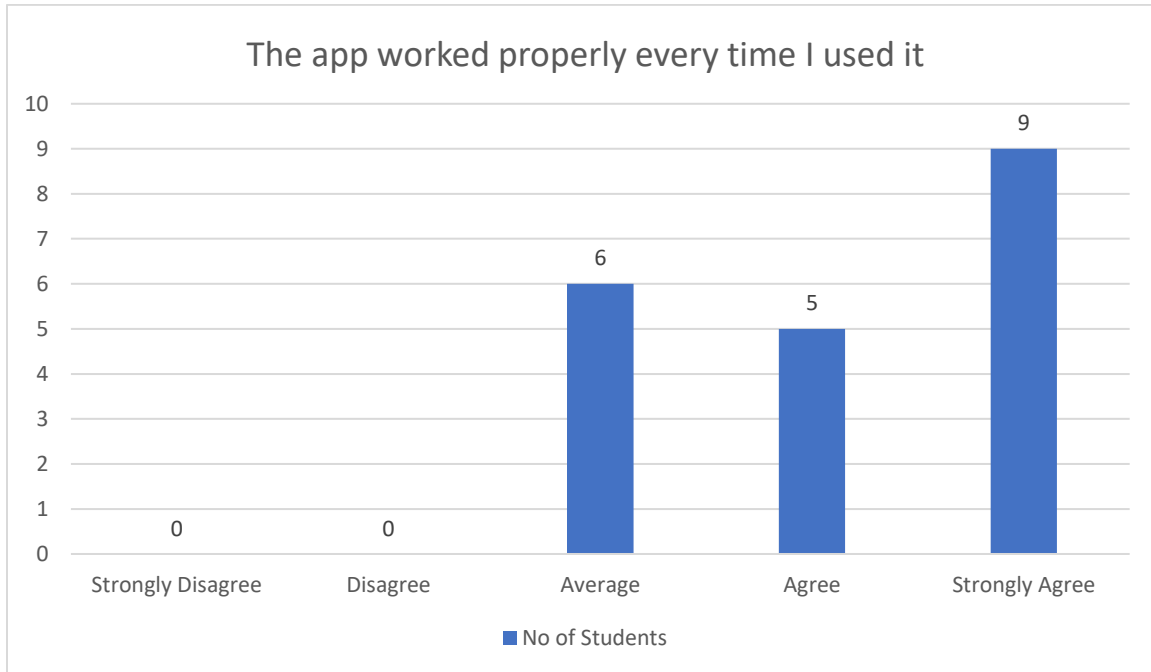


Figure 5. 10 Bar Graph of Students' Response to "The App Worked Properly Every Time I Used It"

When students were asked whether the app functioned properly during each use, 9 (45%) selected strongly agree, 5 (25%) selected agree, and 6 (30%) chose average, while 0 (0%) chose disagree or strongly disagree (Figure 5.10). The highest frequency was 9 students (45%) who strongly agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. While nearly half of the students strongly agreed with the app's reliability, the significant portion of average responses suggests that some users may have experienced occasional inconsistencies or delays. Although no one reported clear dissatisfaction, these average ratings may warrant checking for minor performance issues or loading times.

Question 11: I didn't have problems or errors while using the app

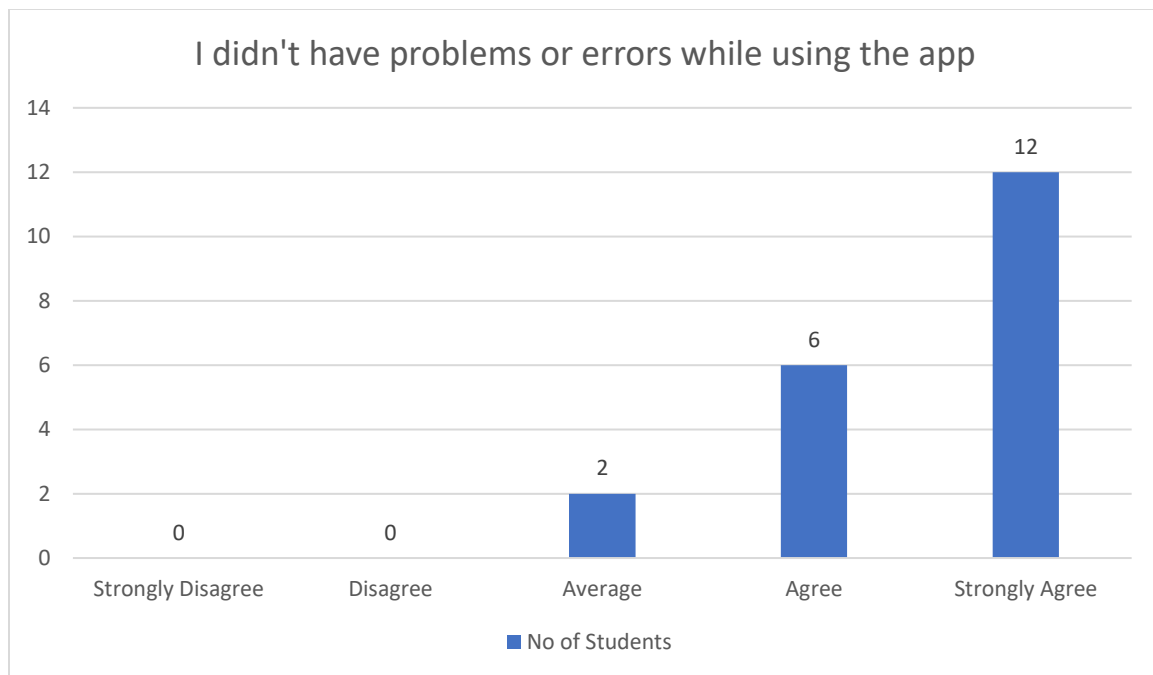


Figure 5. 11 Bar Graph of Students' Response to "I Didn't Have Problems or Errors While Using the App"

Regarding error-free performance, 12 (60%) of the students selected strongly agree, 6 (30%) chose agree, and 2 (10%) selected average, with 0 (0%) choosing disagree or strongly disagree (Figure 5.11). The highest frequency was 12 students (60%) who strongly agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. The majority of students reported a smooth and error-free experience, which reflects positively on the app's technical stability. The small number of average responses may suggest isolated glitches or slower performance for a few users, but the absence of disagreement indicates these issues were not significant.

Question 12: My answers were saved correctly

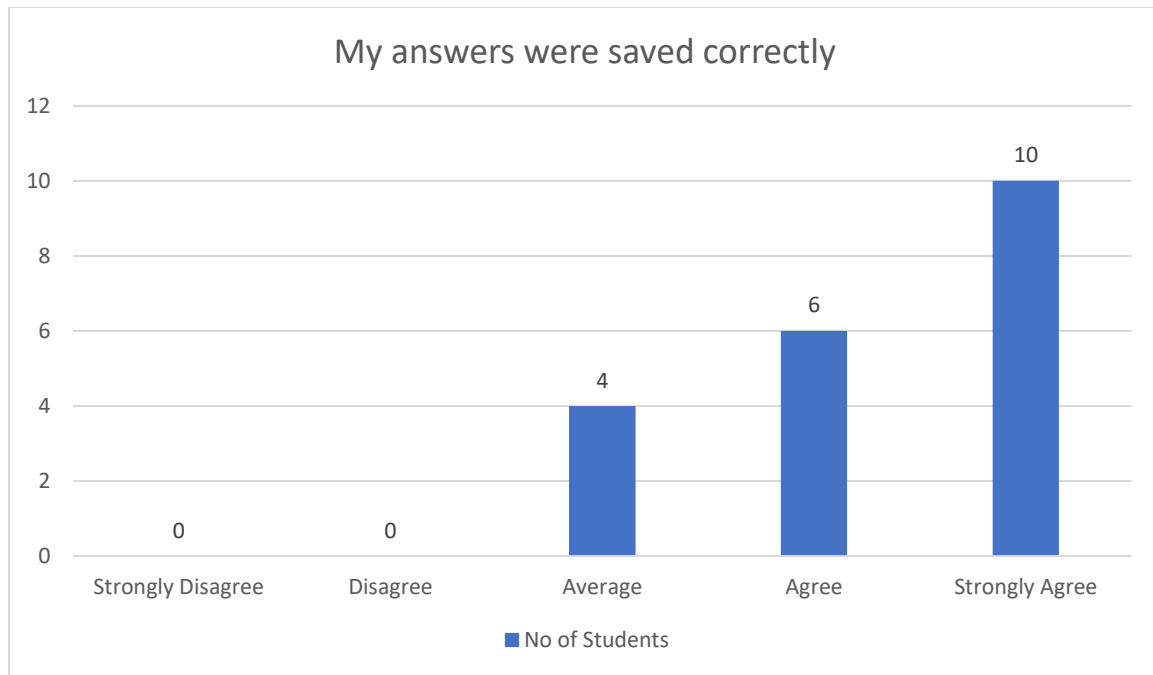


Figure 5. 12 Bar Graph of Students' Response to "My Answers Were Saved Correctly"

Based on Figure 5.12, student responses to this item showed that 10 (50%) chose strongly agree, 6 (30%) selected agree, and 4 (20%) responded with average. No students selected disagree or strongly disagree (0 (0%)). The highest frequency was 10 students (50%) who strongly agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. Half the participants were fully confident in the app's ability to save their responses correctly, while the remaining feedback was still positive but less enthusiastic. The presence of average responses might suggest that a few students were uncertain about whether their answers were saved, which could be resolved with clearer visual confirmation or feedback during submission.

Question 13: I could log in and out without problems

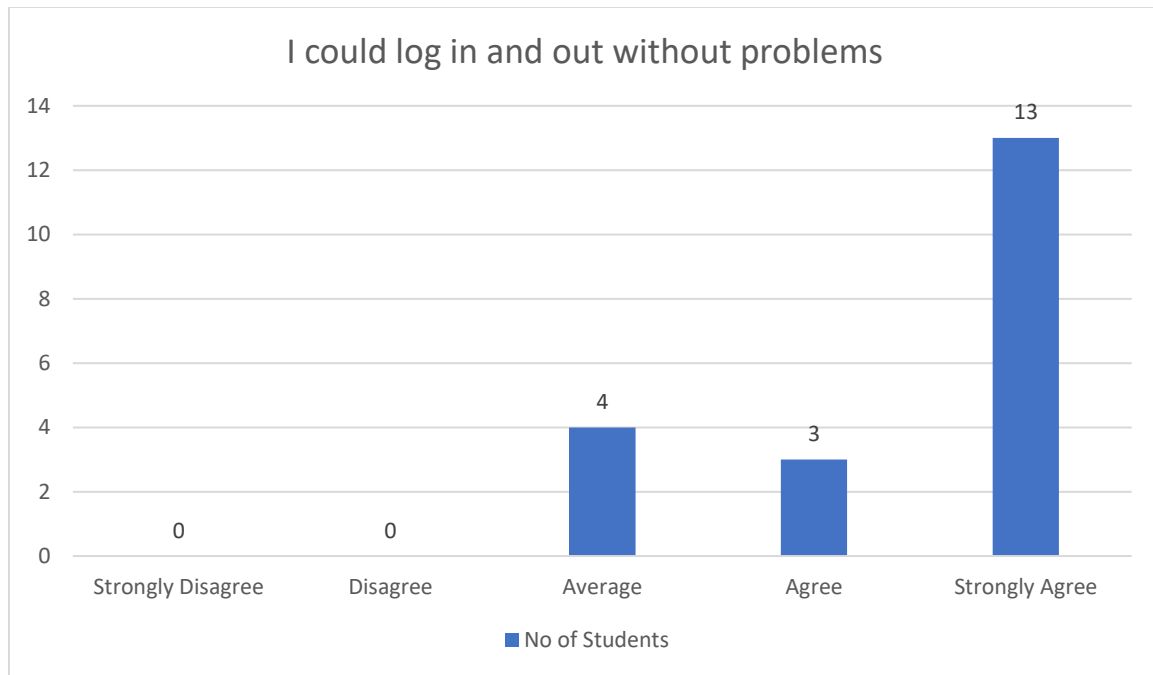


Figure 5.13 Bar Graph of Students' Response to "I Could Log In and Out Without Problems"

In terms of login functionality, 13 (65%) of the students selected strongly agree, 3 (15%) selected agree, 4 (20%) chose average, and 1 (5%) selected disagree, while 0 (0%) chose strongly disagree (Figure 5.13). The highest frequency was 13 students (65%) who strongly agreed, and the lowest was 1 student (5%) who disagreed. The majority had a very smooth experience with logging in and out of the app. However, the presence of one disagreement indicates that at least one student may have faced difficulty with access which is possibly due to network issues, incorrect credentials, or confusion with the login process. Enhancing login instructions or providing clearer feedback for failed attempts could help address this issue.

Part 4: Performance Testing

Question 14: The app loaded quickly when I opened it

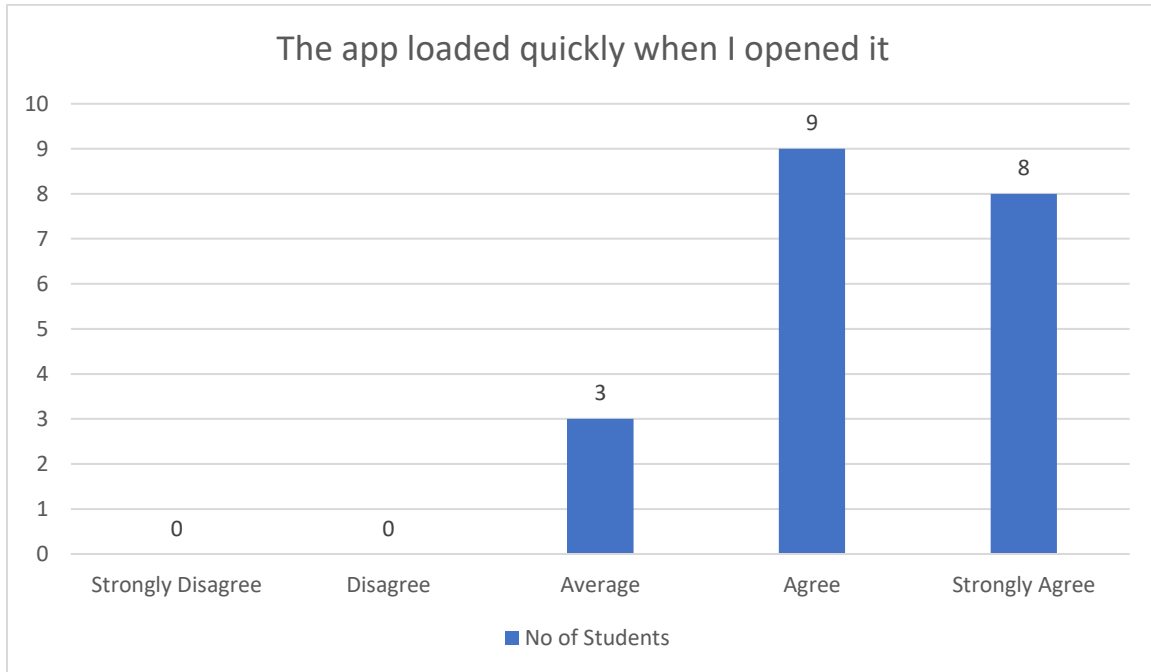


Figure 5. 14 Bar Graph of Students' Response to "The App Loaded Quickly When I Opened It"

In terms of loading speed at launch, 8 (40%) students selected strongly agree, 9 (45%) selected agree, and 3 (15%) chose average, while none (0%) selected disagree or strongly disagree (Figure 5.14). The highest frequency was 9 students (45%) who agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. These results suggest that most students experienced quick loading when opening the app. Although a few gave neutral feedback, the lack of negative responses reflects generally good performance and responsiveness during app startup.

Question 15: Pages opened fast when I clicked on them

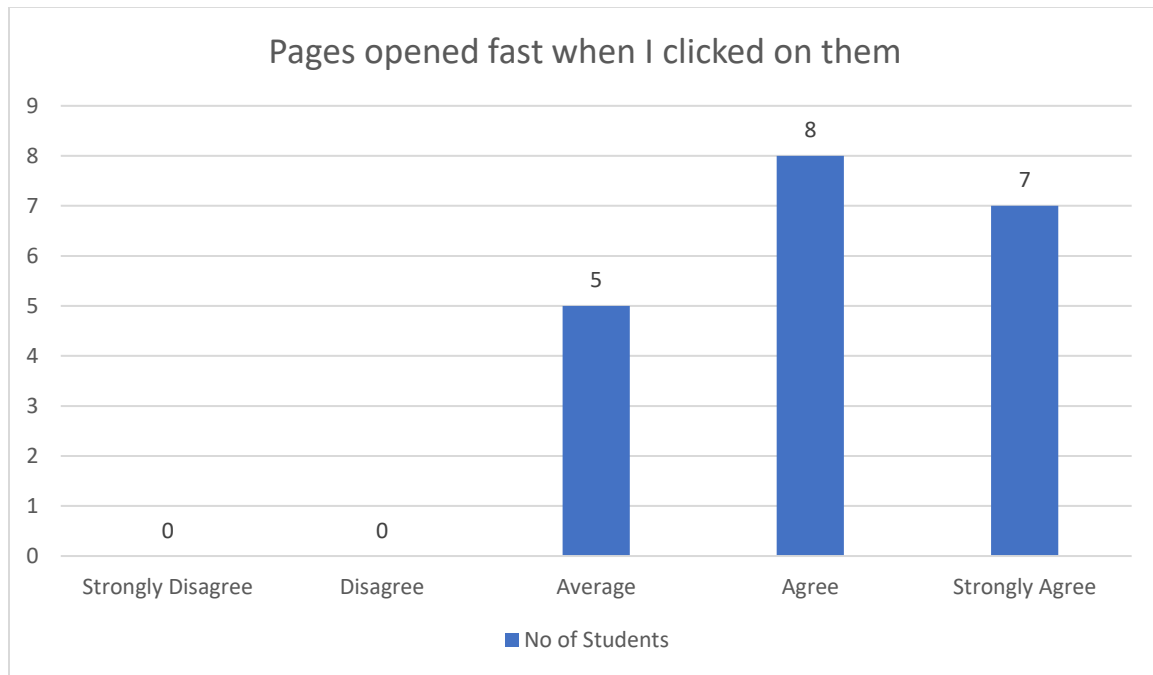


Figure 5. 15 Bar Graph of Students' Response to "Pages Opened Fast When I Clicked on Them"

When asked about the responsiveness of page transitions, 7 (35%) students chose strongly agree, 8 (40%) selected agree, and 5 (25%) rated it as average (Figure 5.15). No students chose disagree or strongly disagree (0 (0%)). The highest frequency was 8 students (40%) who agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. While most users found the app pages to load quickly, the quarter of students who responded neutrally may have experienced brief delays. Still, the overall responses indicate a reliable and fast experience navigating between screens.

Question 16: Videos and pictures loaded quickly

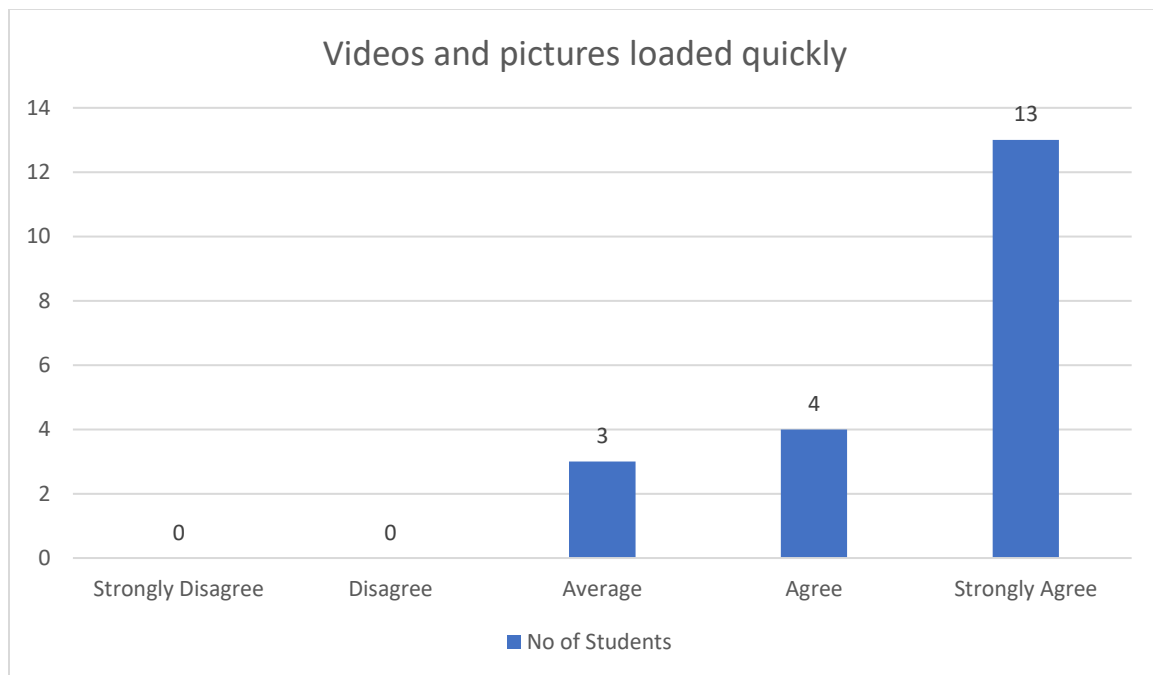


Figure 5. 16 Bar Graph of Students' Response to "Videos and Pictures Loaded Quickly"

For media performance, 13 (65%) students selected strongly agree, 4 (20%) chose agree, and 3 (15%) selected average, with 0 (0%) responses for disagree or strongly disagree as shown in Figure 5.16. The highest frequency was 13 students (65%) who strongly agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. A majority of students found that videos and pictures loaded quickly, showing strong media handling by the app. The few average ratings could be attributed to slower individual internet connections rather than app performance itself.

Question 17: The app worked smoothly without freezing

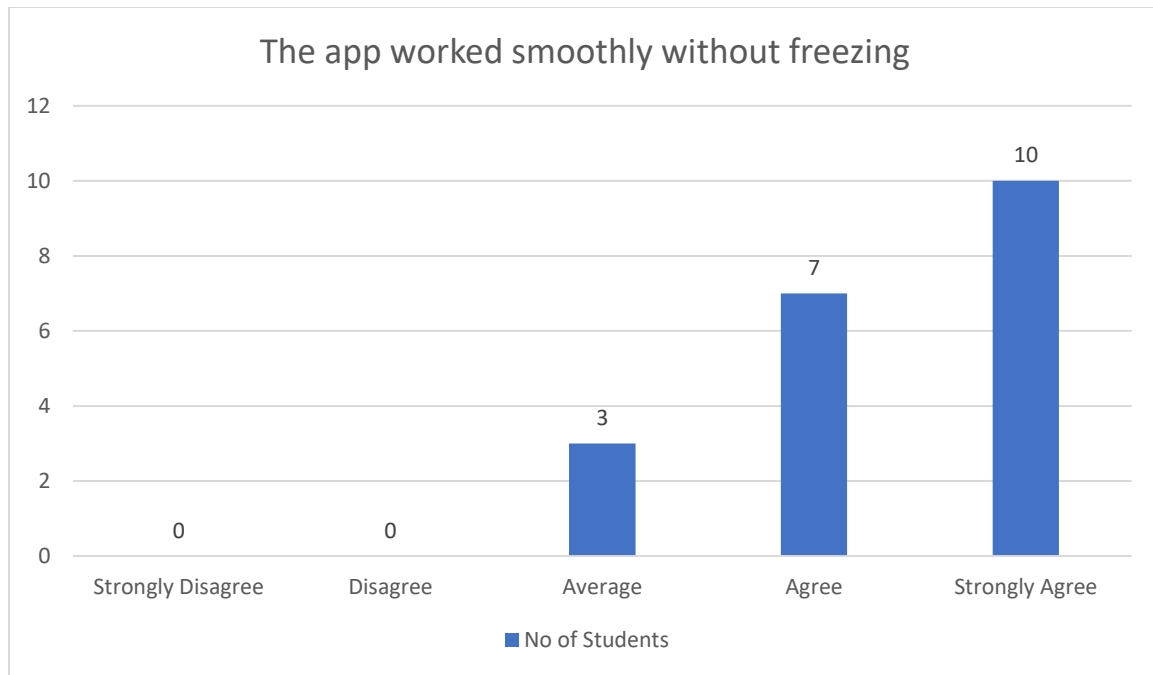


Figure 5. 17 Bar Graph of Students' Response to "The App Worked Smoothly Without Freezing"

Feedback on smooth functionality revealed 10 (50%) students selected strongly agree, 7 (35%) chose agree, and 3 (15%) selected average, with none (0%) choosing disagree or strongly disagree (Figure 5.17). The highest frequency was 10 students (50%) who strongly agreed, and the lowest was 0 students (0%) for both strongly disagree and disagree. These responses show that the app performed without noticeable freezing or lag for most users. The small number of average responses may indicate minor interruptions for a few, but overall, the app's performance appears stable and smooth.

Part 4: User Satisfaction

Question 18: I enjoyed using this learning app

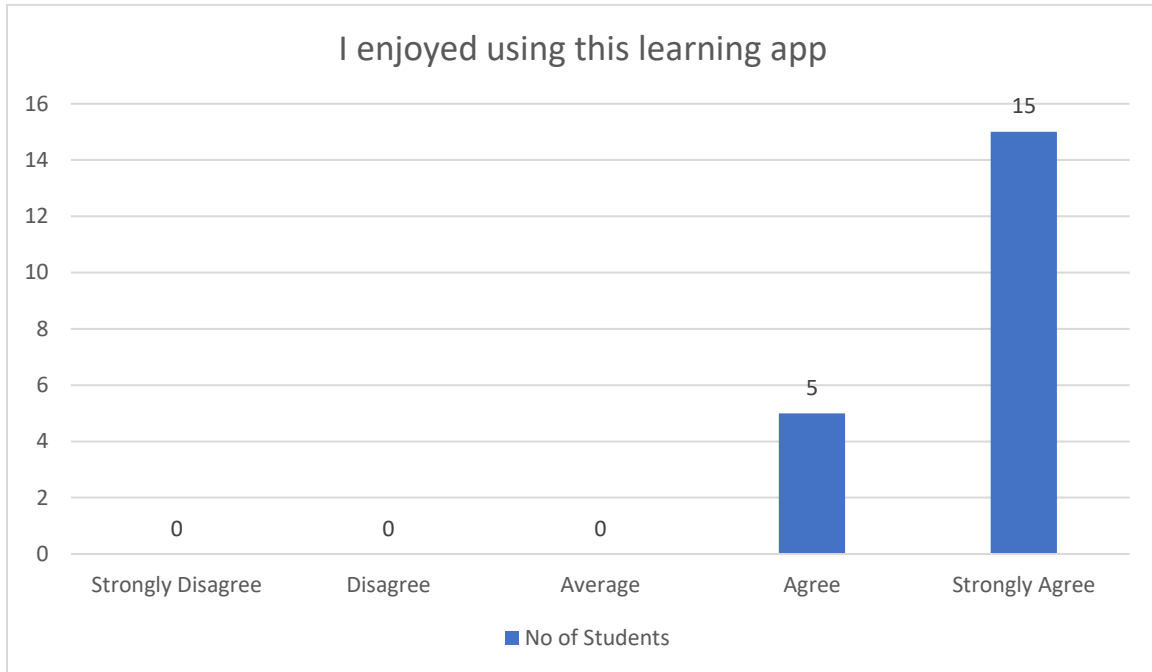


Figure 5. 18 Bar Graph of Students' Response to "I Enjoyed Using This Learning App"

Feedback for this item showed 15 (75%) students selected strongly agree and 5 (25%) selected agree, with none (0%) choosing average, disagree, or strongly disagree as shown in Figure 5.18. The highest frequency was 15 students (75%) who strongly agreed, and the lowest was 0 students (0%) for strongly disagree, disagree, and average. These results reflect very high enjoyment levels among the students. The unanimous agreement with no neutral or negative responses suggests that the app's design, content, and interactivity were highly engaging for Year 5 learners.

Question 19: The app helped me learn new things

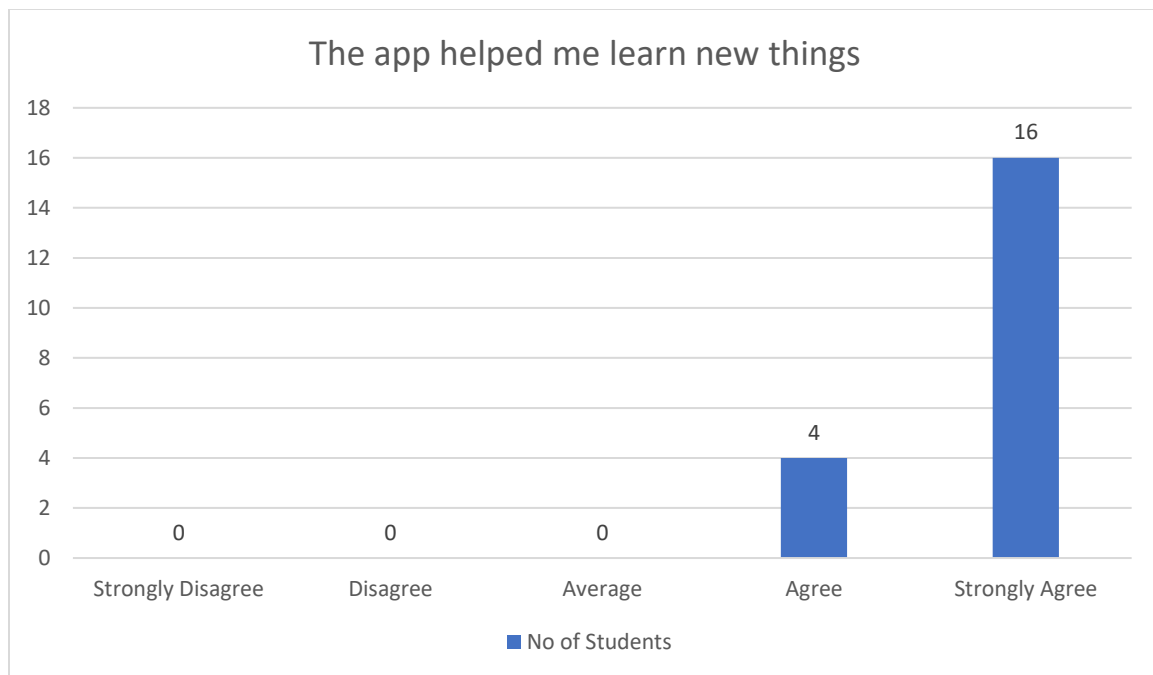


Figure 5. 19 Bar Graph of Students' Response to "The App Helped Me Learn New Things"

When asked about educational value, 16 (80%) students selected strongly agree and 4 (20%) chose agree, while none (0%) chose average, disagree, or strongly disagree as shown in Figure 5.19. The highest frequency was 16 students (80%) who strongly agreed, and the lowest was 0 students (0%) for strongly disagree, disagree, and average. This indicates that the app successfully supports learning and introduces new concepts effectively. The 100% agreement reinforces its usefulness as a learning tool and suggests strong alignment with the students' level and interests.

Question 20: I would tell my friends about this app

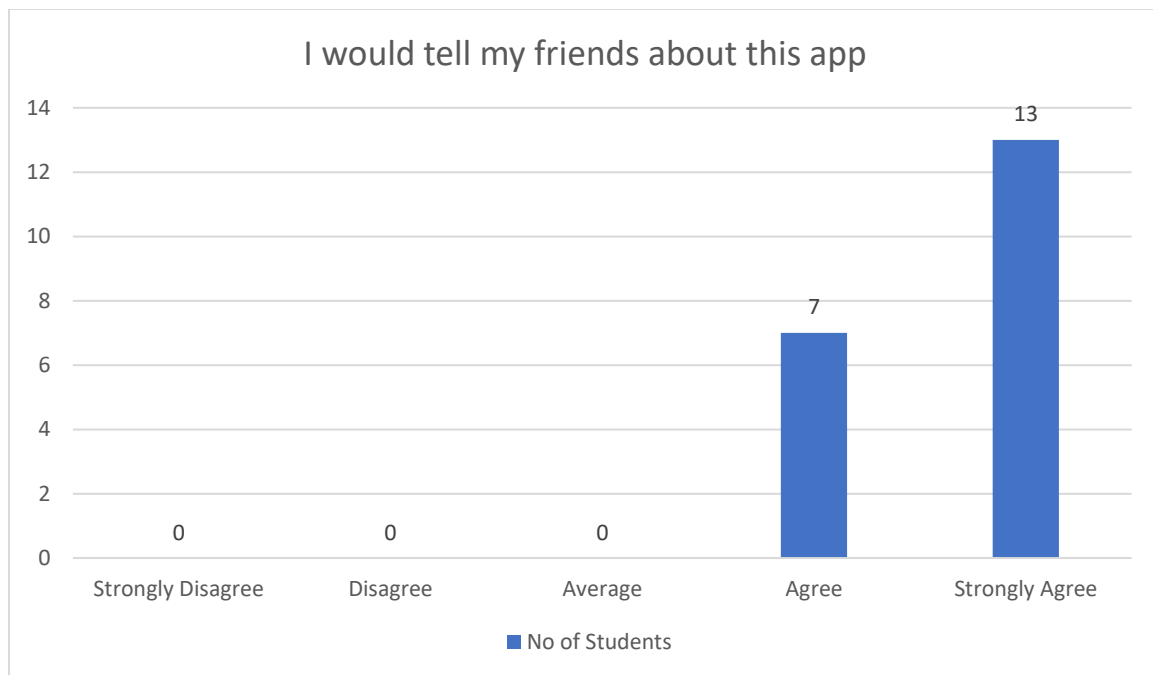


Figure 5. 20 Bar Graph of Students' Response to "I Would Tell My Friends About This App"

Based on Figure 5.20, student responses showed that 13 (65%) selected strongly agree and 7 (35%) selected agree, with none (0%) choosing average, disagree, or strongly disagree. The highest frequency was 13 students (65%) who strongly agreed, and the lowest was 0 students (0%) for strongly disagree, disagree, and average. This suggests a strong likelihood of peer recommendation, which is a positive indicator of satisfaction and perceived value. The lack of any negative or neutral responses highlights the app's potential for word-of-mouth growth among its target audience.

Question 21: This app is better than other learning apps I've used

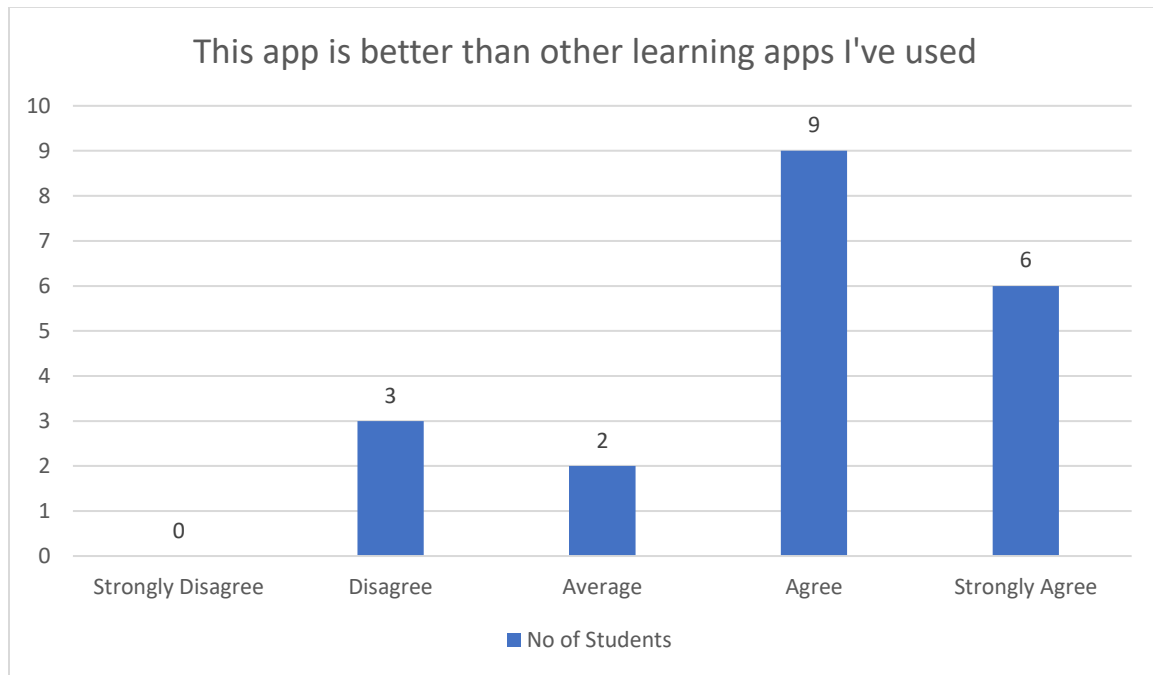


Figure 5. 21 Bar Graph of Students' Response to "This App Is Better Than Other Learning Apps I've Used"

In Figure 5.21, 6 (30%) students selected strongly agree, 9 (45%) chose agree, 2 (10%) selected average, and 3 (15%) chose disagree, while none (0%) selected strongly disagree. The highest frequency was 9 students (45%) who agreed, and the lowest was 0 students (0%) for strongly disagree. While most students rated the app as better than others they've used, a few disagreed or remained neutral. This could be due to varying personal preferences or experiences with other apps. Addressing the feedback through improvements in feature depth or uniqueness may increase competitive perception.

Question 22: Overall, I think this is a good learning app

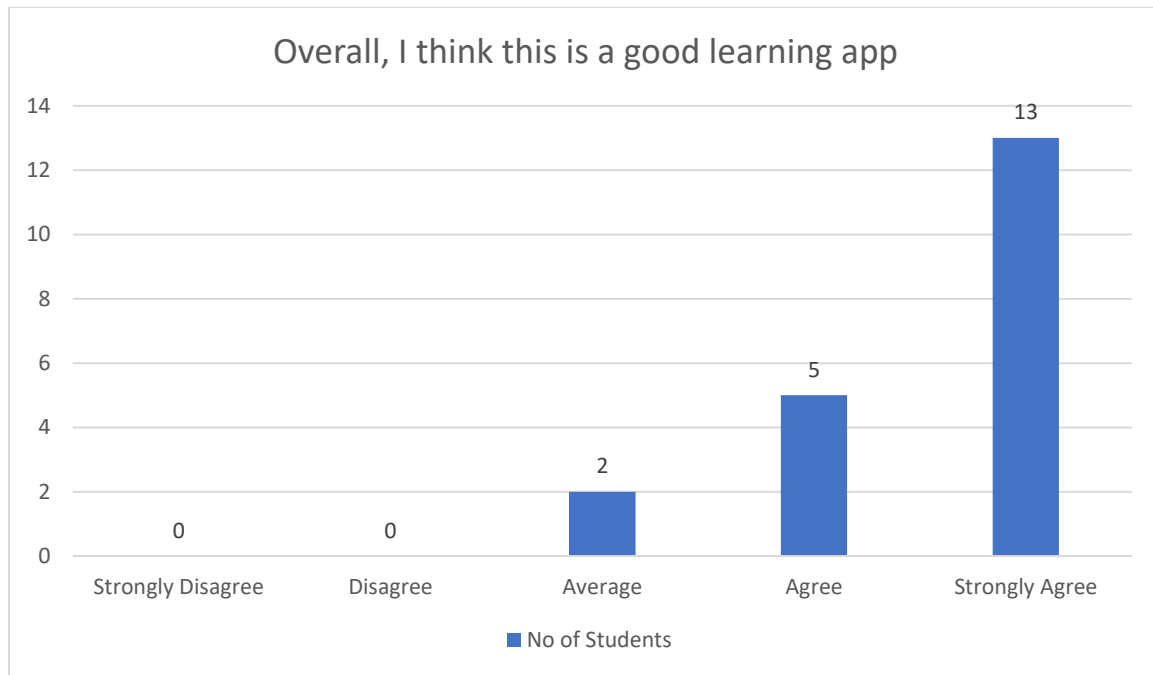


Figure 5. 22 Bar Graph of Students' Response to "Overall, I Think This Is a Good Learning App"

Based on Figure 5.22, student ratings included 13 (65%) who selected strongly agree, 5 (25%) who chose agree, and 2 (10%) who selected average, with none (0%) choosing disagree or strongly disagree. The highest frequency was 13 students (65%) who strongly agreed, and the lowest was 0 students (0%) for strongly disagree and disagree. Overall, the results reflect a very positive impression of the app. The small number of neutral responses may suggest room for minor enhancements, but the overwhelming agreement highlights that the app effectively meets educational needs and expectations.

5.3.2.1.2 User Acceptance Testing by School Counselor

The User Acceptance Testing was conducted with a counseling teacher from SK Muara Tuang. The respondent is a 50-year-old Chinese female, currently serving as a school counselor. Her feedback provides valuable insight into the app's usability, reliability, and educational impact from an educator's perspective, particularly one who is directly involved with student well-being and emotional development.

In terms of usability, the counselor rated all six criteria with the highest score of 5 (strongly agree). This includes statements such as "The app was easy to use," "I could find what I was looking for quickly," "The buttons and menus were easy to understand," and "The words and instructions were easy to read." She also strongly agreed that she learned how to use the app quickly and could easily go back to previous pages. These consistent high scores suggest that the app's user interface is highly intuitive, clear, and accessible for adult administrative users, reaffirming its ease of use for both students and educators.

All four reliability items also received a perfect score of 5 (strongly agree). The counselor strongly agreed that the app worked properly each time it was used, with no problems or errors encountered. She confirmed that her answers were saved correctly and that she could log in and out without issues. This flawless reliability feedback reinforces that the app is technically stable and dependable from an admin's point of view, ensuring seamless functionality during both casual and formal use.

Performance-wise, the counselor gave 5 (strongly agree) for page-loading speed and 4 (agree) for three criteria: app loading time, media loading (videos and pictures), and overall smoothness without freezing. While all responses remain positive, the slightly lower scores for

media and initial loading suggest there may be room for optimization in these areas, particularly under varying network conditions. Nonetheless, the app is still considered fast and responsive in general.

Regarding user satisfaction, the counselor expressed a very favorable opinion. She rated 5 (strongly agree) for enjoying the app, learning new things from it, being willing to recommend it to others, and agreeing that it is overall a good learning app. The only slightly lower rating was a 4 (agree) for the statement comparing it to other learning apps. This suggests she found it highly effective and engaging, though she may have encountered similar tools before. Still, the consistently strong feedback confirms the app's educational value and positive impression.

In conclusion, the counselor's responses indicate that the app meets high standards across usability, reliability, performance, and user satisfaction. Notably, she highlighted her appreciation for the quiz sections focused on understanding emotions, stress management, and bully prevention where it is one of the features she had previously requested during the requirement phase. This specific feedback demonstrates that the app successfully aligns with educator needs and provides meaningful, relevant content that supports students' emotional literacy and well-being. Based on the overall UAT test results, the counselor formally accepts the app and finds it suitable for use in an educational setting.

5.4 Summary

In conclusion, functionality testing and user acceptance testing are the two forms of testing that are employed in this chapter. These two tests can help developers find system defects during the testing stage of the development process. To ensure a top-notch customer experience, any problems or mistakes should be fixed as soon as possible. Consequently, this system fulfilled all objective of the project.

CHAPTER 6: CONCLUSION AND FUTURE WORK

6.1 Introduction

This chapter concludes the project's work in terms of project completion. The chapter summarizes the accomplishments achieved throughout its development. In addition, it also outlines the limitations encountered during the process for this project and provides recommendations for future enhancements, offering potential directions for continued improvement and expansion of the project.

6.2 Project Achievement

The objectives of this project are to develop an engaging and age-appropriate web-based platform that introduces at least three key mental health topics through fun content tailored for Year 5 primary students. It aims to reinforce learning and promote self-reflection through knowledgeable educational modules and quizzes. Additionally, the project includes the design of an assessment feature which is the DASS-Y to help identify students who may require further support, enabling early intervention by counselors.

Table 6. 1 Project Achievements based on Objectives

Objective	Achievement	Status
To develop an age-appropriate web-based platform that introduces at least three mental health topics through	The platform incorporates three core mental health topics such as Understanding Emotions, Stress Management, and Bullying	Achieved

fun content tailored to Year 5 primary student.	Prevention where each designed with practical techniques such as emotion recognition, coping strategies, and peer support. It features an age-appropriate, colorful, and engaging interface tailored to Year 5 students, using emojis, animations, simple language, and responsive design for accessibility across devices. Fun elements include animated topic cards with flip effects, embedded educational videos, integrated external games, and a content delivery system to enhance learning and maintain student engagement.	
To implement an educational modules and quizzes to reinforce learning and encourage self-reflection.	The platform's educational modules provide comprehensive, structured content for each mental health	Achieved

	topic, enriched with multimedia elements such as images and descriptive text, and guided by a learning path that leads to quizzes and entertaining games. Each module includes a topic-specific quiz featuring five questions with instant feedback, visual progress tracking, and automated scoring to enhance engagement. Additionally, a self-reflection system allows students to complete weekly emotional check-ins, guiding them through a multi-step process that explores feelings, coping strategies, and support needs. A personalized dashboard displays historical check-in data, helping identify	
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	emotional patterns and track overall progress.	
To design an assessment feature called DASS-Y that can help identify students needing further support, enabling counselors to intervene early.	The platform integrates the DASS-Y (Depression, Anxiety, Stress Scale for Youth), a clinically validated 21-question assessment tailored for children, using a 4-point Likert scale to automatically score and classify severity levels across three domains. To support early intervention, the system identifies risk levels ranging from Normal to Extremely Severe, presents results in a child-friendly and reassuring format, and ensures data is stored for ongoing tracking. A dedicated counselor dashboard offers a comprehensive view of student mental health,	Achieved

	including individual progress, risk level visualization, class-wide statistical insights, and tools for searching and filtering students by class or mental health status.	
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6.3 Project Limitation

Even though MyMindaHub successfully achieved its core objectives, the system does have some limitations which was identified and would benefit from future attention:

- The current implementation requires an internet connection at all times and does not support offline usage.
- The application currently lacks integration of an AI-powered chatbot to provide interactive or personalized assistance to users.
- Currently available only in English without multilingual support.

6.4 Future Work

Based on the project achievements and identified limitations, the following future enhancements are recommended to expand MyMindaHub's capabilities and impact:

- Offline features can be added so users can still use the app even without internet access.
- Implement AI-powered chatbot for 24/7 student support and guidance.

- Translate platform into multiple languages for diverse student populations.

6.5 Summary

The proposed system objectives and their achievements has been discussed in this chapter in detail. In simple terms, the system developed has met the requirements of the project's objectives. However, there are some limitations that MyMindaHub System possess where it cannot perform and that can be addressed in future improvements.

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APPENDICES

APPENDIX A: Interview Form for System Requirements (Clinical Psychologist)

Mental Health Educational Web App Interview Questions

Research Topic:

MyMindHub: A Web App for Mental Health Education and Early Intervention for Year 5 Primary Students

Name: Hazel Saw

Occupation: Clinical Psychologist

1. How has the perception and acceptance of mental health issues evolved in Malaysia over the past decade, particularly regarding children's mental health?

The perception and acceptance of mental health issues in Malaysia have undergone significant changes over the past decade. Historically, mental health was often stigmatized and given little priority in the healthcare sector. However, there has been a growing recognition of the importance of mental health, with increasing acceptance and attention given to the issue in both public discourse and healthcare policy. Stigma on children's mental health in particular, has diminished significantly. Increased awareness in campaigns led by the government, NGOs and the media which often emphasized the importance of early intervention and the need to support children's emotional well-being have brought about positive effects. Parents or caregivers are increasingly more aware of the signs of mental health issues in children and are increasingly open to seeking professional consultations and interventions. Schools in Malaysia have also begun to recognize the importance of supporting mental health at an early age, with many organizations incorporating counselling services, mental health education and so forth. Despite these progress, some challenges remain, such as ongoing stigma and limited availability of mental health professionals in some areas.

2. What impact do you think Malaysia's education system and academic pressure have on students' mental well-being, and how does this compare to other countries in the region?

The impact of Malaysia's education system and academic pressure on students' well-being is a complex issue that depends on several factors, including the specific school environment and the individual child's coping mechanisms. Academic pressure in Malaysia often stems from a system that emphasizes exam results as the primary measure of success. This can lead to high levels of stress, anxiety and feelings of inadequacy

among students, particularly those who struggle to meet expectations. Comparing to other Asian countries like South Korea and Singapore where there is significant academic pressure but also increasing awareness around mental health and support systems in schools, Malaysia is still in the process of integrating mental health support into the education system.

Academic pressure is also dependent on school as well as the individual child. Schools which prioritize academic performance, as well as schools who treat all students equal instead of fostering children's education based on their individual capacities and abilities are likely to give more pressure, resulting in more mental health issues among students who are not compatible to this style. Some children flourish under pressure and work well in academic settings, and continue to do well in life. Some may flourish in the academic setting, but face a lot of mental health struggles when out of school later on in life. Schools that cater to the specific and individualized needs of the students, consider mental health factors in their curriculum as well as policies, consider students' mental well-being and schools who prepare children for the practical life outside four walls of school are likely to assist their students in fair better in life.

There is a growing recognition in Malaysia that academic pressure should not come at the expense of emotional and mental health. However, the challenge remains in ensuring that all schools recognize the importance of mental health.

3. Do you think that early child education on mental health is necessary and important? Why?

Yes. Early education on mental health is essential. Teaching children to recognize the importance of mental health, to take seriously and to know how and where to seek support, equips them with valuable life skills. By normalizing mental health conversations from a young age, we can reduce stigma and promote a healthier, more supportive environment for all. Early mental health education lays the foundation for lifelong well-being and resilience.

4. At what age do you believe that it is the most appropriate time for introduction to mental health? Why?

Mental health education can begin as early as infancy. At this stage, children primarily learn about emotions through their caregivers' responses and emotions are modeled at home and in early childhood settings. By teaching young children to recognize, accept, and regulate their emotions, we can normalize mental health and reduce stigma from the start. These foundational skills should be integrated into daily life, not just as isolated lessons, to promote healthy emotional development and well-being.

5. What are the most appropriate topics to introduce for Year 5 students? (3 topics)

*a) Understanding Emotions
b) Resilience Building: Coping with Stress and Difficult Emotions (including recognizing signs and symptoms)
c) The Importance of Friendships and Peer Relationships (what makes a good friend, how to resolve disagreements, how to support others who are down - friendships are important at this age)*

6. In your experience, what are the most common mental health challenges faced by primary school children, particularly around age 11 (Year 5)?

*1) Academic pressures: Children at this age may experience stress related to academic performances, tests, and preparing to transition to a secondary school.
2) Identity crises: Children become more self-aware at this age, and this often couple with experiences of confusion about their identity, which can lead to self-esteem and body image concerns.
3) Low self-esteem and Confidence Issues: Children this age may struggle with feelings of inadequacy or compare themselves unfavorably to their peers.
4) Social struggles: Children at this age are navigating friendships, peer pressure and their desire to fit in can cause anxiety and feelings of exclusion.
5) Anxiety: Increasingly worry about school, social situations and the future is common among children this age.
6) Emotional Regulation: Children at this age may find it difficult to regulate strong emotions like anger, frustration, or sadness which may lead to behavioral challenges.*

7. What early warning signs should children, parents, and educators be taught to recognize?

Recognizing early signs are important for timely interventions and supports. Some early signs include: Changes in behavior, changes in mood, difficulties in concentrating, physical complaints that are unexplainable, changes in social interactions, changes in

sleep or appetite. If these signs significantly impact the child's day-to-day functioning, then seeking professional help is strongly recommended.

8. What metrics would you recommend for measuring the effectiveness of a mental health education app?

While I am not fully familiar with all the specific metrics for measuring the effectiveness of a mental health education app, there are several key principles commonly used to evaluate mental health interventions: i.e. Usage frequency, completion rate, pre-post test to measure knowledge attained, tracking changes in users' coping strategies and symptoms, behavioral changes over time, retention rates.

9. What role does stigma play in child mental health, and how can digital tools help address this?

Stigma can significantly hinder early intervention and prevent children from seeking support or attaining support which in turn would impact their overall mental health and development. Digital tools can help reduce stigma and promote healthy understanding of mental health among children. Digital tools can provide education, create safe spaces for communication, as well as offer resources of support.

10. What role do you think technology should play in mental health education and support?

Technology should complement available traditional mental health services by offering convenience, support and education in a way that is accessible and engaging for users.

Technology can help increase accessibility for individuals who may not have access to traditional face-to-face services due to geographical concerns, or social barriers. It can also play a role by offering education to destigmatize mental health and normalizing discussions about emotional well-being. Technology allow people to get support immediately through apps or online counseling, including equipping self with self-regulation strategies, coping skills and whatnot. Technology can also enhance preventive care by supporting early detection through screening tools, self assessments as well as educational materials about preventive care.

APPENDIX B: Interview Form for System Requirements (School Counselor)

Mental Health Educational Web App Interview Questions

Research Topic:

MyMindalHub: A Web App for Mental Health Education and Early Intervention for Year 5 Primary Students

Name: *Teacher Lai*

Occupation: *School Counselor*

1. How do you currently deliver mental health education to students and What mental health topics do you currently cover with Year 5 students?
 - Through programs like *Ujan Minda Sihat*
 - Have speakers give talks like polls and set up banners as well as posters
 - Its stress on topics like stress, verbal and physical bully, family problem, friendship problem and sexual disturbance in school which are sensitive
2. Do you year 5 students understand what is stress or mental health?
 - Not really
 - They do not realise they are going through stress but they do feel it and are undergoing it and this is because they don't fully understand the meaning of stress
 - For mental health, the term is very big and it is hard for them to really understand what is the real meaning and its effects
3. How comfortable are students in discussing mental health issues with counselors?
 - Moderate
 - 50/50
 - This is because of the stigma and the perspective that going to the counselling teacher's office, means you are a problematic student
 - It does not motivate students to meet counselor because they feel ashamed
 - However, some of the students are aware that there is a counselling teacher in school and that is ready to help the student

4. What signs or indicators do you look for when assessing a student's mental well-being?
 - Consultation and referred by their class teachers and subject teachers
 - Can be identified through their expression, actions and sometimes even attire
 - This could be due to a few factors like not enough affection from family as well as academic stress
5. What assessment methods do you currently use to evaluate students' mental well-being?
 - No proper system
 - However, depending on the seriousness of the students, the counselling teacher will intervene
 - So if it is a serious case, then the student visit the counselling teacher everyday and even meets the senior assistant of student affairs or also known as "Pendang Kanan Hal Fikwal Murid" (PK HFM)
6. What specific mental health topics do you think are most crucial for Year 5 students?
 - Stress
 - Sexual Disturbance in a school setting
 - Bully
 - Family Problem and relationship
7. What types of interactive activities do you think would be most engaging for this age group?
 - Mini games
 - Quizzes
 - Drawing
8. What features would make the app most useful for you as a counselor?
 - Admin features and dashboard
9. What challenges do you anticipate in implementing a digital mental health education tool?
 - Lack of internet connection
 - Poor understanding and literacy on language
 - Time constraint as one subject in class is about 30 mins to an hour
 - Lack of electronic device since some students don't have their own device and use their parent's phone
10. In your opinion, how long should a student spend on the web app?
 - 30 to 40 mins

APPENDIX C: Questionnaire Form for System Requirements

Mental Health Educational Web App Survey

Instruction: Kindly read through the questions from the survey form and put a tick in the box (✓) provided according to the answer that is relevant to you.

i Demographic

1. How old are you?
Answer: 11

2. Gender:
Boy ☐ Girl ☒

3. Race:
Malay ☒ Chinese ☐ Indian ☐ Iban ☐ Bidayuh ☐ Kadazan ☐
Others: _____

i Technology Usage and Accessibility

4. Which electronic device do you use the most?
Mobile phone ☒ Computer ☐ Tablet ☐

5. How often do you use the device?
Every day ☒ A few times a week ☐ Once a week ☐ Rarely ☐ Never ☐

6. Where do you usually access the internet? (You can choose more than one):
Home ☒ School ☐ Others: _____

i Mental Health Understanding

7. Have you studied about Mental Health in school?
Yes ☒ No ☐

8. Has there been any Mental Health Programs done in your school?
Yes ☒ No ☐

9. Do you fully understand what is Mental Health?
Don't understand ☒ Neutral ☐ Understand ☐

10. How do you feel about talking about your feelings with others?
Comfortable ☐ Neutral ☒ Very uncomfortable ☐

11. When you feel sad or worried, who do you usually talk to? (You can choose more than one):
Parents ☒ Teachers ☐ Friends ☐ School ☐ Counselor ☐ Nobody ☐
Others: _____

i App Features and Preferences

12. What type of activities do you enjoy most on apps? (You can choose more than one)
Games ☐ Quizzes ☐ Videos ☒ Stories ☐ Others: _____

13. What would make learning about feelings and mental health more fun? (You can choose more than one)
Earning rewards or achievements ☐ Playing with friends ☒
Engaging and interactive content ☐ Mini-games ☐ Others: _____

i Visual Preferences

14. What type of visual elements do you find most appealing in an app? (You can choose more than one)
Simple icons and clean design ☐ Detailed illustrations or graphics ☐
Animations and dynamic visuals ☐ Photographs and real-life images ☒
Others: _____

i User Experience

15. How long would you like to spend on the app at one time?
10-20 minutes ☐ 20-30 minutes ☒ 30-40 minutes ☐ 1 hour ☐
More than 1 hour ☐ Others: _____

APPENDIX D: Pictures from School Visit for System Requirements



APPENDIX E: User Acceptance Testing for Students

User Acceptance Testing (UAT)

User Acceptance Testing (UAT) Survey
MyMindahub Web Application for Year 5 Primary Students

Dear Student,

We would like to know what you think about this educational mental health app called MyMindahub you just used. Your thoughts are very important to us!

How to answer:

- Read each question carefully.
- Choose ONE answer and tick in the box (B) provided that best describes how you feel about the web app.

Answer choices:

- ☆☆☆☆ Strongly Agree – I really, really think this is true
- ☆☆☆☆ Agree – I think this is true
- ☆☆ Average – I'm not sure / It's okay
- ☆☆ Disagree – I don't think this is true
- ☆☆ Strongly Disagree – I really, really don't think this is true

Section A: Demographic

1. How old are you?

☐ 9 years old

☐ 10 years old

☒ 11 years old

☐ 12 years old

Other: _____

User Acceptance Testing (UAT)

2. Are you a boy or girl?

☐ Boy

☒ Girl

3. Race:

☒ Malay

☐ Chinese

☐ Indian

☐ Iban

☐ Dayak

☐ Kadamm

Other: _____

Question	Rate				
	Strongly disagree (1)	Disagree (2)	Average (3)	Agree (4)	Strongly Agree (5)
4. The app was easy to use				✓	
5. I could find what I was looking for quickly					✓
6. The buttons and menus were easy to understand				✓	
7. I learned how to use the app quickly					✓
8. The words and instructions					✓

User Acceptance Testing (UAT)

9. I could easily go back to previous pages					✓
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Section C: Reliability Testing (How Well the App Works)

10. The app worked properly every time I used it					✓
11. I didn't have problems or errors while using the app					✓
12. My answers were saved correctly					✓
13. I could log in and out without problems					✓

Section D: Performance Testing (How Fast the App Works)

14. The app loaded quickly when I opened it					✓
15. Pages opened fast when I clicked on them					✓
16. Videos and pictures loaded quickly					✓
17. The app worked smoothly without freezing					✓

Section E: User Satisfaction Testing (How Much You Liked the App)

18. I enjoyed using this learning app					✓
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User Acceptance Testing (UAT)

19. The app helped me learn new things					✓
20. I would tell my friends about this app					✓
21. This app is better than other learning apps I've used				✓	
22. Overall, I think this is a good learning app				✓	

OPTIONAL: Tell us more!

What did you like MOST about the app?

Any comments or feedback to make the app better?

Tester Signature	Date	Overall UAT Result (Accept/Reject)
Mig	20.6.2025	Accept

⚡ Thank you for helping to make the app better!

APPENDIX F: User Acceptance Testing for Counsellor

User Acceptance Testing (UAT)

User Acceptance Testing (UAT) Survey
MyMindHub Web Application for Year 5 Primary Students

Dear Counselor,

We would like to know what you think about this educational mental health app called MyMindHub you just used. Your thoughts are very important to us!

How to answer:

- Read each question carefully.
- Choose ONE answer and tick in the box (B) provided that best describes how you feel about the web app.

Answer choices:

- ★★★★★ Strongly Agree = I really, really think this is true
- ★★★★ Agree = I think this is true
- ★★★ Average = I'm not sure / It's okay
- ★★ Disagree = I don't think this is true
- ★ Strongly Disagree = I really, really don't think this is true

Section A: Demographic

1. How old are you?

☐ 9 years old

☐ 10 years old

☐ 11 years old

☐ 12 years old

Other: SD

User Acceptance Testing (UAT)

the app quickly					✓
8. The words and instructions were easy to read					✓
9. I could easily go back to previous pages					✓
Section C: Reliability Testing (How Well the App Works)					
10. The app worked properly every time I used it					✓
11. I didn't have problems or errors while using the app					✓
12. My answers were saved correctly					✓
13. I could log in and out without problems					✓
Section D: Performance Testing (How Fast the App Works)					
14. The app loaded quickly when I opened it					✓
15. Pages opened fast when I clicked on them					✓
16. Videos and pictures					

User Acceptance Testing (UAT)

loaded quickly					✓
17. The app worked smoothly without freezing					✓
Section E: User Satisfaction Testing (How Much You Liked the App)					
18. I enjoyed using this learning app					✓
19. The app helped me learn new things					✓
20. I would tell my friends about this app					✓
21. This app is better than other learning apps I've used					✓
22. Overall, I think this is a good app					✓

OPTIONAL: Tell us more!

What did you like MOST about the app?
Using the emojis, stories & hints

Any comments or feedback to make the app better?

User Acceptance Testing (UAT)

Tester Signature	Date	Overall UAT Result (Accept/Reject)
<u>SA</u>	<u>20/6/2025</u>	<u>Accept</u>

⚡ Thank you for helping us make the app better!

APPENDIX G: Pictures from School Visit for User Acceptance Testing

