UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECP1513-02 TECHNOLOGY AND INFORMATION SYSTEM

Design Thinking Project Report

Project Title: Student Engagement and Wellness Analytics

Group 10: TechNexus

Lecturer: Dr. Aryati binti Bakri

 **Name:** Nur Nazirah Hanis binti Nazri **Matric No. :** A25CS0319	 **Name:** Humayra' binti Zulqarnain **Matric No. :** A25CS0068
 **Name:** Ng Xuan Yee **Matric No. :** A25CS0291	 **Name:** Nur Hanani Sazwani binti Muhammad Helmi Wan **Matric No. :** A25CS0313

CONTENTS

1.0 INTRODUCTION

1.1 Background Statement

Student engagement is defined as the intensity of involvement a student maintains in their studies and the level of connectivity established with their respective classes and peers [1]. Measurement of this engagement is traditionally conducted through four (4) quantitative metrics: truancy, test scores, attendance, and homework completion [2]. Furthermore, the correlation between digital engagement and psychological well-being in technical universities has been identified as a significant factor in modern higher education [3].

Complementary to engagement, student wellness is defined as the mental and emotional strength that allows students to handle university stress effectively [4]. Research shows that wellness is more than just "not being stressed", it is the presence of two (2) key traits: the ability to bounce back from challenges and confidence in one's own abilities. It has been found that a healthy state of mind is a requirement for staying active in studies. In contrast, when mental health declines, it becomes the main reason why students stop attending classes or withdraw from their courses [5].

Poor academic performance is frequently linked to high levels of perceived stress and psychological distress, which negatively impact a student's cognitive functions and cumulative grade point average (CGPA) [6]. This decline is often exacerbated by the absence of effective monitoring systems, resulting in two (2) primary consequences: diminished social interaction and increased difficulty in managing academic workloads. While institutions utilize Learning Management Systems (LMS) to track activities, these systems are often utilized as passive repositories rather than active tools for early intervention, leaving a gap in real-time support for students at risk [7]. To address these limitations, this project proposes a comprehensive weekly analysis report that integrates two (2) distinct data streams—student engagement and wellness information—synthesized through automated visual analytics.

1.2 Purpose

The primary objective of this report is to propose a well-defined prototype for a student engagement and wellness analytics system. This system is designed to utilize digital footprint data extracted from external applications, such as one (1) primary Learning Management System (eLearning), to demonstrate the integration of activity logs and survey data within a weekly reporting framework. Within this prototype, the concepts of engagement scores and social scores are quantified using three (3) distinct methods: specific numerical values, comparative figures, and analytical charts. These metrics are utilized to facilitate targeted interventions and provide necessary support for the student cohort.

The development of this prototype is structured around the Design Thinking methodology, which provides a strategic framework for defining system requirements. This approach offers significant advantages, ranging from the individual level to large-scale organizations, by fostering innovation and mitigating development risks [8]. A user-driven approach is ensured through the prioritization of the empathy phase, which allows for the identification of specific student needs. Consequently, the application of this methodology results in accelerated student satisfaction and more effective problem-solving within the project scope [8].

1.3 Analysis of Key Factors

To further define the scope of the engagement and wellness analytics system, four (4) critical factors and their respective impacts on the student population were analyzed. These factors provide the foundation for the metrics utilized in the prototype. The relationship between academic variables and student outcomes is summarized in Table 1.0.

Factor	Description	Impact on Students
Academic Workload	Number of assignments and deadlines	Increased stress and burnout
Participation	Involvement in class activities	Reduced engagement
Motivation	Willingness to complete tasks	Delayed submissions
Social Interaction	Group work and peer support	Feelings of isolation

Table 1.0: Key Factors Affecting Metrics Such as Student Engagement and Wellness

1.4 Methodology

The development of the student engagement and wellness analytics system is governed by the five (5) phases of the Design Thinking methodology. This framework is utilized to ensure that the final prototype is strictly aligned with the actual needs of the students through a user-centric approach. The sequential progression of these phases is illustrated in Figure 1.0.

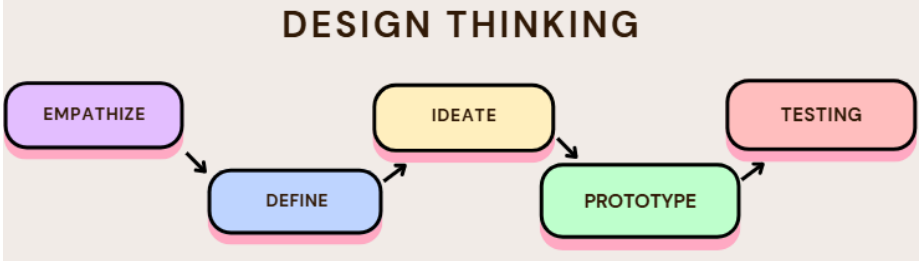

Figure 1.0: The Five Phases of the Design Thinking Framework

2.0 DETAILED STEPS

In November 2025, a Design Thinking project was assigned with the objective of developing a prototype based on the selected theme of Student Engagement and Wellness Analytics. Through a series of four (4) formal meetings and structured discussions, solutions relevant to the theme were identified. It was observed that students frequently experience fluctuations in motivation, participation, and mental wellness. Consequently, a system was proposed to monitor these trends through data-driven insights.

2.1 Empathize Phase

As the initial step, an online discussion via WhatsApp was conducted to determine and create relevant questions for data collection and to identify the appropriate methods for gathering the required

information. After the discussion, a Google Form survey was created, with thirteen (13) questions, as a medium to efficiently gather quantitative data from a larger student population regarding student wellness and engagement. The survey was distributed across six (6) localized UTM student groups on WhatsApp platforms. Data was collected over a duration of one (1) week with the total of seventy (70) respondents. Simultaneously, interview sessions were conducted with four (4) students within the Universiti Teknologi Malaysia (UTM) campus to gather qualitative data. These sessions aimed to identify specific challenges regarding academic involvement and emotional well-being. Photographic evidence and the profiles of the interviewees are presented in Appendix A, while the survey results are detailed in Figures 4.0 to 4.10.

2.2 Define Phase

During the Define phase, the data collected from the seventy (70) respondents and four (4) interviewees was analyzed through group discussions to determine the main issue. The challenges faced by students were synthesized into a singular problem statement:

"Although students actively utilize digital platforms, digital footprint data is not analyzed to identify patterns of low motivation or early signs of stress. Without a centralized system to track these trends, students may fail to recognize declines in mental well-being until academic performance is negatively impacted."

2.3 Ideate Phase

Following the establishment of the problem statement, brainstorming sessions were conducted to generate potential solutions. A total of nine (9) core features were identified for integration into a singular digital application. These features include overall engagement metrics, mood surveys and calendars, and attendance tracking. Additionally, physiological and psychological monitoring tools were incorporated, specifically pulse rate monitoring, stress level assessment, and social engagement tracking. To ensure proactive support, the system was designed to include automated warning alerts, assignment reminders, and a comprehensive weekly analysis report. These nine (9) ideas were prioritized based on their technical feasibility and their direct impact on the four (4) key factors of student wellness.

2.4 Prototype Phase

In this phase, the proposed solution was translated into a visual format. A low-fidelity prototype was initially developed through hand-drawn sketches to map the layout and screen sequence. Subsequently, a high-fidelity interactive prototype was developed using the Canva platform to incorporate clickable elements and navigation menus. This digital prototype was designed to visualize the student journey across the nine (9) identified features. The evolution from initial sketches to the final digital interface is demonstrated through the comparison of ten (10) visual representations found in Figures 6.0 to 6.9.

2.5 Test Phase

The final phase involved the evaluation of the prototype's functionality and the overall experience of the participating students. Internal testing was first executed by the project team to identify navigation

errors. This was followed by a student testing session conducted with three (3) students from the Faculty of Computing. During this session, the three (3) students were invited to interact with the digital Canva prototype, and the feedback provided by these students was recorded via a structured evaluation form. This process allowed for the refinement of the interface to ensure it effectively addressed the needs identified during the Empathy phase. Detailed evidence of this testing session, including the feedback logs obtained from the three (3) students, is documented in Section 5.5.1.

3.0 DETAILED DESCRIPTION

3.1 Problem

In recent years, people have been surrounded by stressful events, most of which cannot be easily avoided. Pressure in studies is faced by students at all grade levels, and this pressure is often found to be greater for university students. Tasks related to handling heavy academic loads and complicated relationships must be managed constantly.

Assignments and projects are expected to be completed before deadlines, and high performance in different courses is required. Meanwhile, active participation in extracurricular activities, talks, and programs is also expected from the students. As a result, stress and anxiety are frequently felt, and distractions during classes are more commonly experienced. The severity of this issue is evidenced by the survey results in Figure 4.3, where it is indicated that thirty-seven point one percent (37.1%) of the seventy (70) respondents from UTM students experience extreme stress levels.

Even though digital platforms such as e-learning, WhatsApp, and other study applications are actively used by students, the data generated from these platforms is rarely analyzed to identify signs of low motivation, less participation, or early signs of stress. Since no centralized system is provided to monitor these trends, mental health issues are often not identified until academic performance is negatively impacted.

3.2 Solution

To solve this problem, a solution was developed to track student engagement and well-being. After three (3) distinct ideas were generated during the ideate phase, it was concluded that the implementation of a mobile application, named UniWell, was most necessary. Idea 3 was selected based on three (3) criteria: its strong alignment with project objectives, high accessibility for the student demographic, and the ability to provide accurate real-time data tracking. The application is considered highly beneficial as four (4) support types are provided, including personal feedback, improvement advice, wellness activities, and progress tracking. By centralizing these features within one (1) platform, student motivation and stress levels can be monitored more effectively, allowing for a better balance between academic and personal life to be achieved.

3.3 Team Working

To address the requirements of the project, a total of four (4) formal meetings were held by the team to brainstorm and share ideas. After the project title was finalized, tasks were distributed among the

four (4) members based on individual strengths. The five (5) phases of Design Thinking: Empathy, Define, Ideate, Prototype, and Test were strictly applied to complete the project.

It was agreed by all team members that teamwork and work efficiency were promoted by consistent communication. Discussions were actively contributed to by all members, and progress was constantly updated through three (3) primary channels: formal meetings, WhatsApp group, and GitHub backlog. This collaborative structure allowed all project requirements to be completed within the allocated time frame. Detailed evidence regarding the progress of the team and the specific distribution of tasks among the four (4) members is documented in Section 8.0 and the Log Journal found in Appendix B.

4.0 DESIGN THINKING ASSESSMENT POINTS

To ensure the assessment effectively evaluates the essential components of design thinking, careful planning and structured development were required throughout the process. The main objective in assessing the UniWell application was to evaluate the effectiveness of the proposed solution in addressing issues related to student stress, motivation, and engagement.

4.1 Empathize Phaze

During this phase, Meeting 1 was conducted via WhatsApp to finalize the project direction. To gain a deeper understanding of student needs, surveys were conducted via Google Forms to collect data from seventy (70) respondents. Furthermore, interview sessions were conducted with four (4) students to ensure their academic challenges were thoroughly understood.

4.2 Define Phase

Meeting 2 was held physically at N28A, Faculty of Computing, where the data collected from the surveys and interviews was analyzed. Based on the 37.1% stress rate identified as shown in Figure 4.3, the core problem was defined. It was concluded that the primary issue was the absence of one (1) centralized system that allowed students to monitor stress and motivation levels effectively.

4.3 Ideate Phase

A total of three (3) potential solutions were generated, with each suggestion being evaluated for relevance and feasibility. Solutions deemed overly complicated were discarded. At the conclusion of this phase, the decision was reached to develop UniWell. The application was designed to assist students through daily check-ins and progress tracking features.

4.4 Prototype Phase

The selected ideas were transformed into a tangible design. A prototype was developed utilizing both hand-sketched layouts and digital designs in Canva. The prototype was designed with nine (9) core features, allowing students to record daily stress levels and view progress through one (1) simplified dashboard. This solution was intended to be simple and interactive, with the potential for further customization to suit diverse academic lifestyles. Furthermore, the prototype was presented to Dr. Aryati

via WhatsApp on 24 December 2025 to ensure the design met the technical requirements before the testing phase commenced.

4.5 Test Phase

The completed prototype was tested by three (3) UTM students from the Faculty of Computing to determine if user requirements were successfully met. At the conclusion of this phase, feedback was obtained, and specific areas for improvement were identified to ensure the final design remained user-centered; these findings are recorded in Section 5.5.1. This phase served as the final assessment point to verify the prototype's feasibility before the report and video were finalized on 30 December 2025.

5.0 DESIGN THINKING EVIDENCE

5.1 Empathy Phase

An interview session was conducted with four (4) students from Universiti Teknologi Malaysia (UTM) to obtain qualitative data regarding learning engagement, weekly class participation, and stress levels. The participant group was composed of four (4) students aged 19. The participants consisted of one (1) student from the Faculty of Computing, while the remaining three (3) students represented the Faculty of Chemical & Energy Engineering. Detailed student profiles and corresponding photographic evidence are documented in Appendix A.

To ensure consistency across the research sessions, a structured set of questions was developed. The established list of interview questions is displayed in Figure 2.0.

-INTERVIEW-

1. How often do you attend classes, participate in activities or engage with eLearning each week?
2. What factors usually influence your motivation to study or attend classes?
3. Do you often feel stressed or overwhelmed during the semester?
4. What methods or habits do you currently use to manage your stress, motivation or study routine?
5. Would you find it helpful to have a system that tracks your motivation, stress level and engagement to help you improve your student life? Why or why not?

Figure 2.0: List of questions during interview

Other than interviews, a Google Form survey was distributed to six (6) UTM student groups via WhatsApp and Telegram platforms to collect quantitative data related to student engagement and motivation. The survey was utilized to obtain responses from seventy (70) Universiti Teknologi Malaysia (UTM) students within a one (1) week duration. The structure of the survey is illustrated in Figures 3.0 to 3.3, which comprise three (3) general demographic questions and ten (10) multiple-selection questions specifically designed to capture patterns in student learning behaviors.

Figure 3.0 shows that age, gender and faculty were collected to examine differences in motivation, wellness, participation, and engagement across student groups.

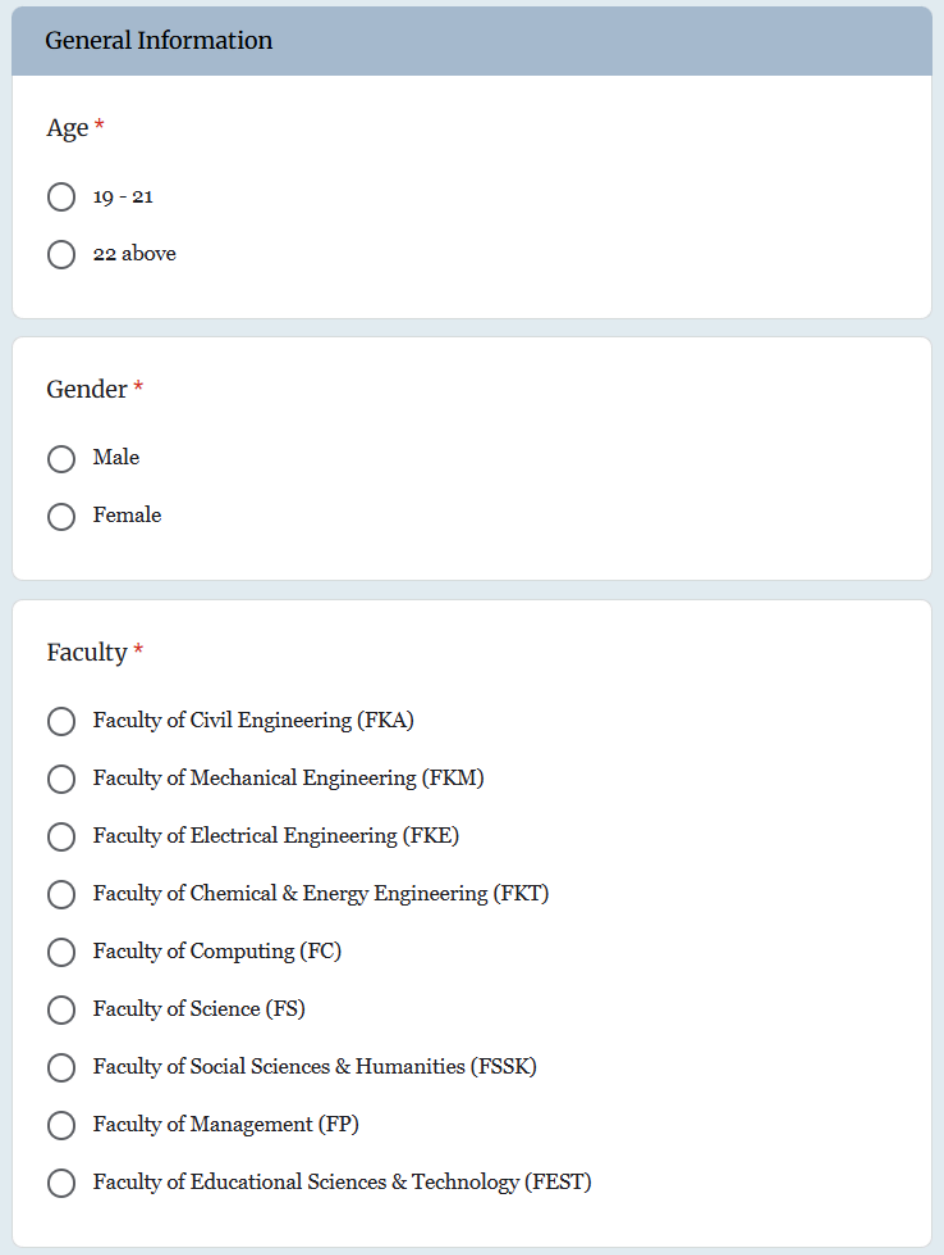

Figure 3.0

Figure 3.1 presents the two (2) survey questions on students' enthusiasm for participating in class activities and their motivation to complete assignments, homework, or projects on time. These questions were included to assess students' engagement and academic motivation, which are key factors influencing participation, learning outcomes and overall wellbeing.

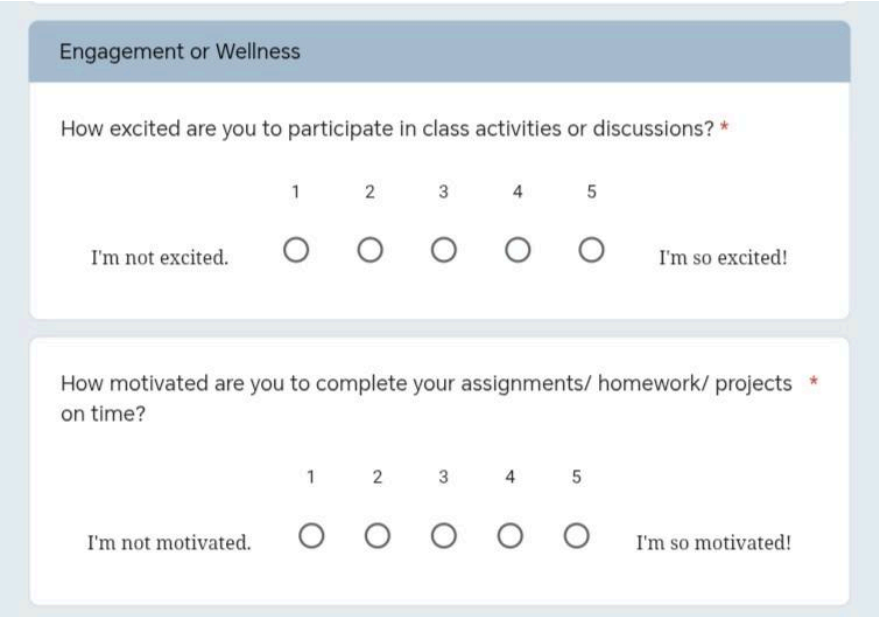

Figure 3.1

Figure 3.2 presents the two (2) survey questions to examine students' peer relationships and comfort in group work, which are important factors affecting engagement, participation and collaborative learning outcomes.

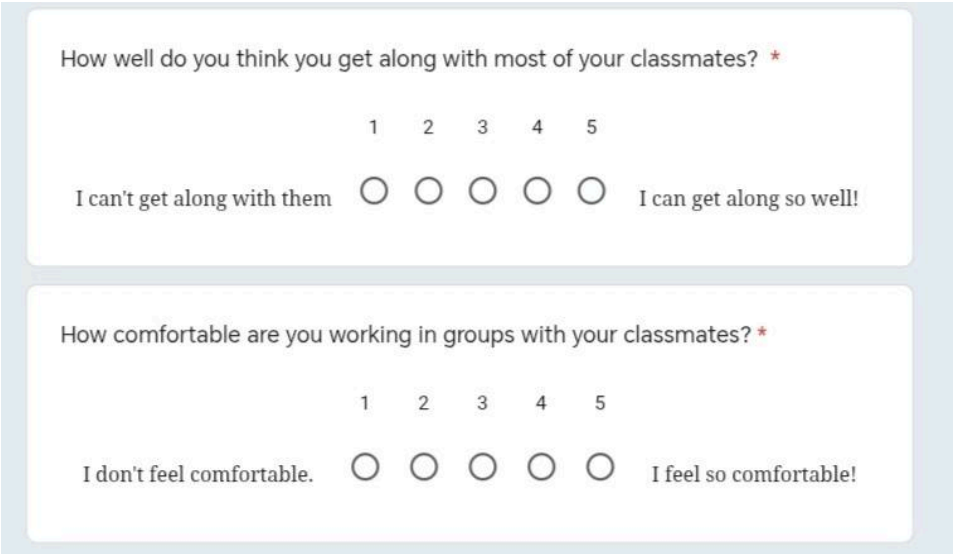

Figure 3.2

Figure 3.3 presents two (2) survey questions to assess students' stress levels and identify common sources of stress, which are important for understanding their impact on motivation, participation, and overall wellbeing.

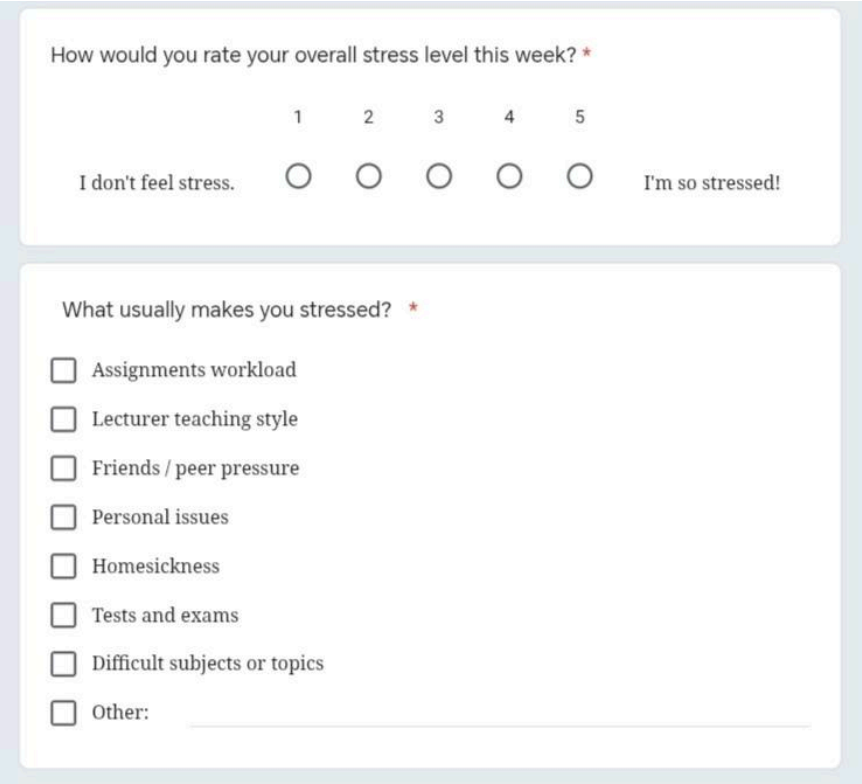

Figure 3.3

Figure 3.4 presents a survey question to examine students' stress management and how students cope with stress.

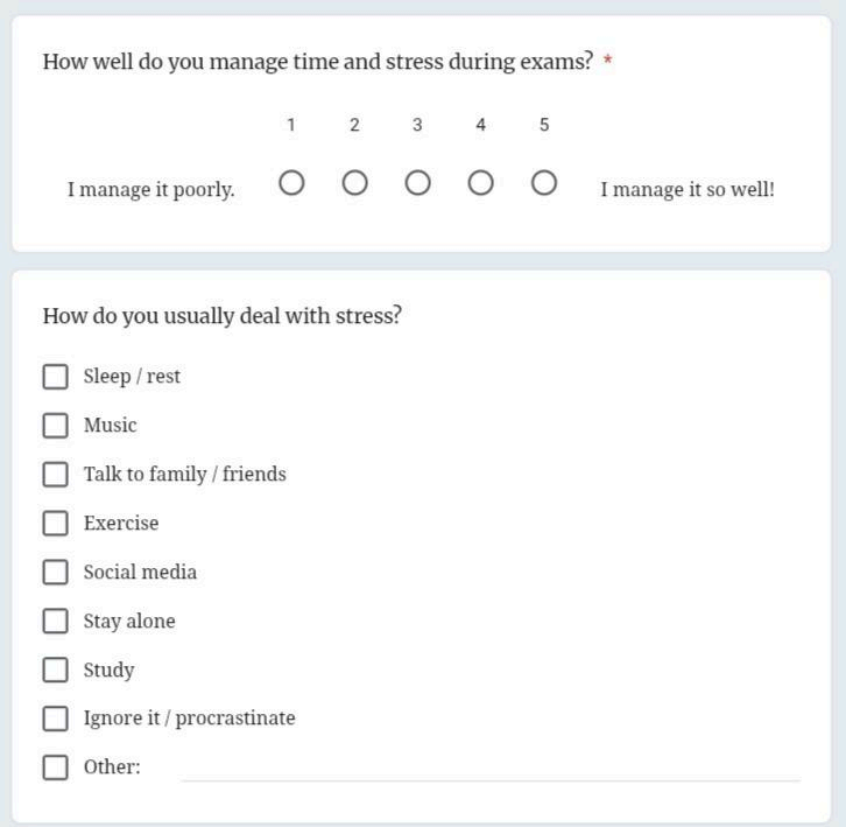

Figure 3.4

Figure 3.5 presents a survey question to examine students' study rest patterns during long study sessions, providing insight into their management and overall wellbeing.

Figure 3.5

Figure 3.6 presents a survey question to assess students' perceptions of using an app to monitor engagement and wellness, providing insight into the potential usefulness and acceptance of digital tools for supporting academic performance and wellbeing.

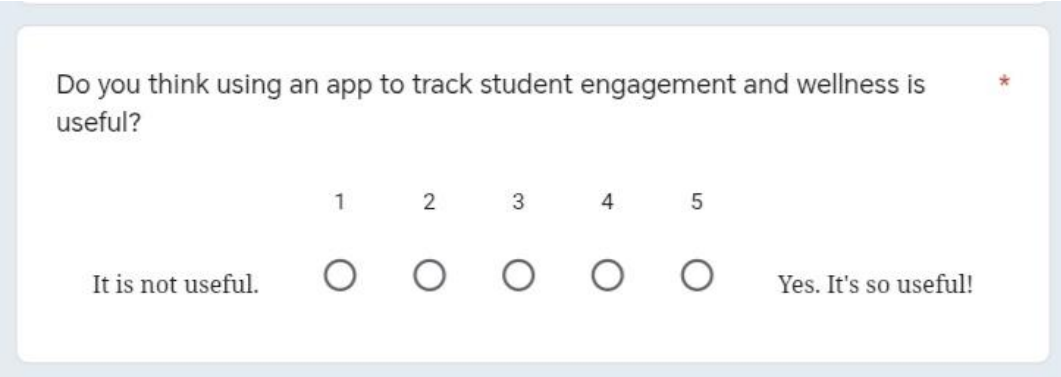

Figure 3.6

Figure 3.0 - Figure 3.6:
List of Questions in the Google Form Survey

5.2 Define Phase

In this phase, data were collected from the interview sessions and a Google Form survey. The qualitative data were obtained through interviews with four (4) students, while quantitative data were gathered from 70 survey respondents, which met the targeted sample size. Based on the analysis of the collected data, the main challenges faced by students were identified.

Figure 4.0 shows the respondent's profile based on age, gender and faculty based on data obtained from Google Form Survey. The majority of students (97.1%) were aged between 19 and 21 years. Female respondents constituted 74.3%, while male respondents accounted for 25.7%. Almost half of the respondents were from the Faculty of Computing (44.3%), followed by the Faculty of Management (14.3%) and the Faculty of Chemical & Energy Engineering (12.9%).

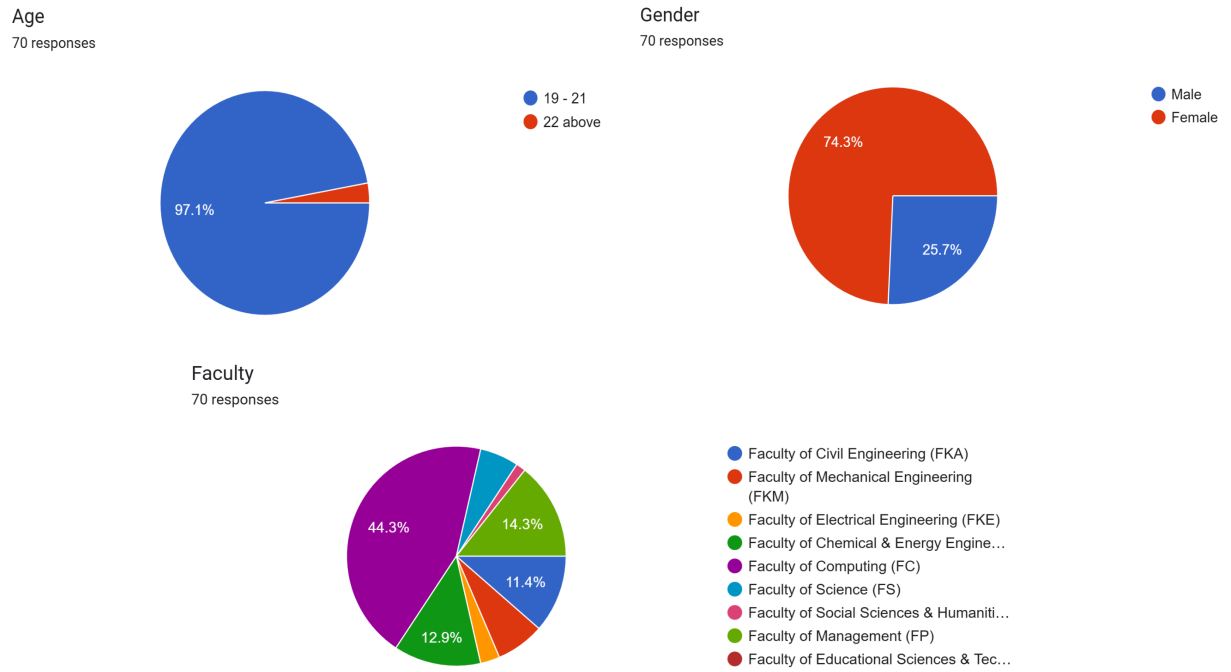

Figure 4.0: Respondent's Profiles

Figure 4.1 shows the responses to students' level of excitement in participating in class activities. The majority of respondents (42.9%) reported being "Somewhat excited", followed by "Neutral" (25.7%).

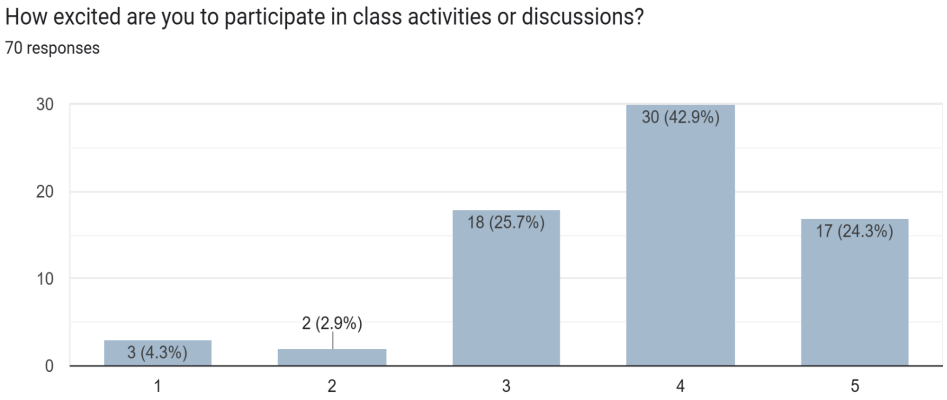

Figure 4.1: Responses to Question 1

Figure 4.2 shows the responses regarding students' motivation to complete assignments on time. Based on the results, most of the students (34.3%) are moderately motivated to meet deadlines.

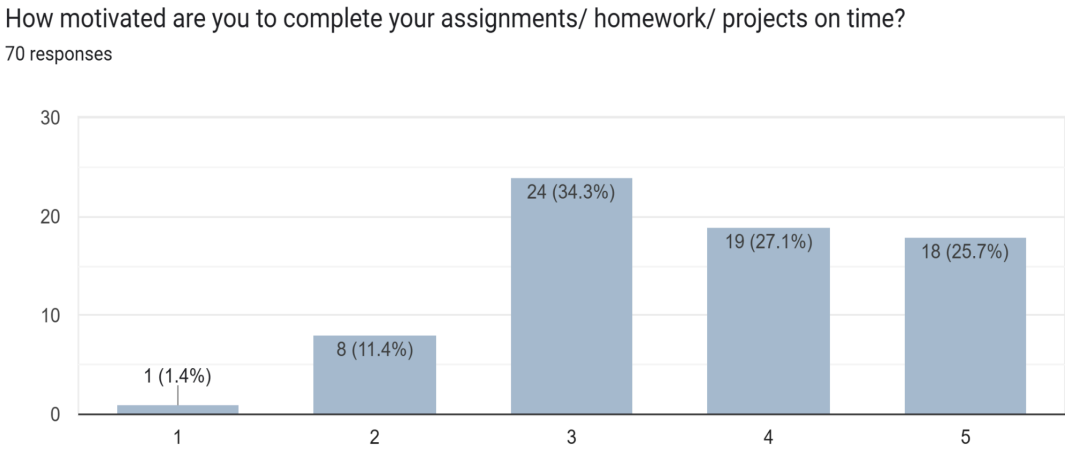

Figure 4.2: Responses to Question 2

Figure 4.3 shows the students' stress levels for the week (Week 10). Most of the students (37.1%) experience a high level of stress the entire week.

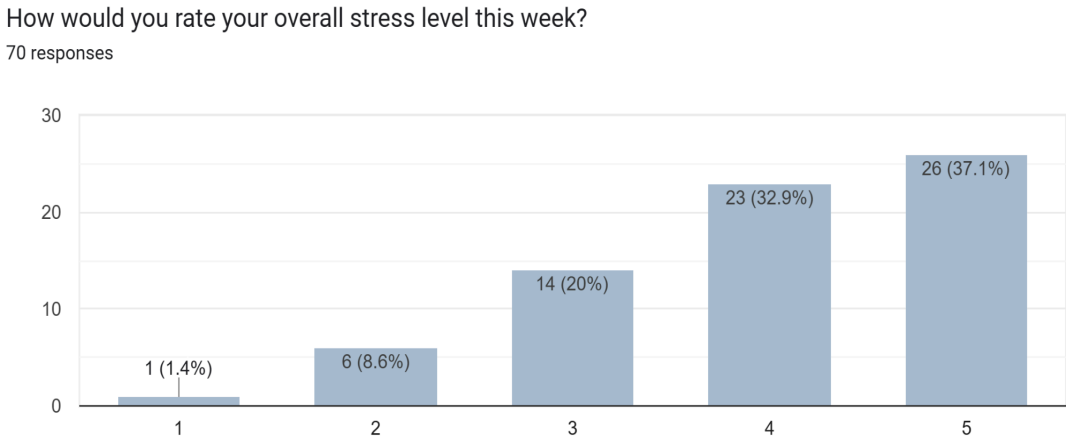

Figure 4.3: Responses to Question 3

Figure 4.4 shows the main causes of stress among students. The majority (74.3%) indicated assignments workload as their main contributor, followed by tests and exams (72.9%) and difficult subjects (58.6%).

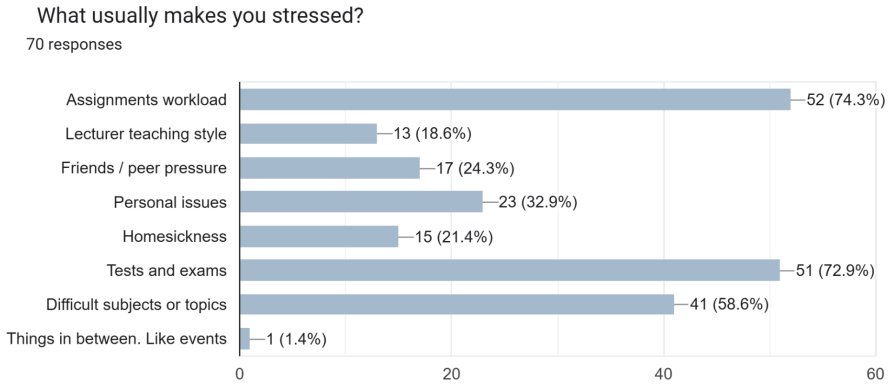

Figure 4.4: Responses to Question 4

Figure 4.5 shows the responses regarding students' interpersonal relationships with classmates. The largest proportion of respondents (51.4%) reported "Well", followed by "Very well" (21.4%). This reflects that most students maintain positive relationships with their peers.

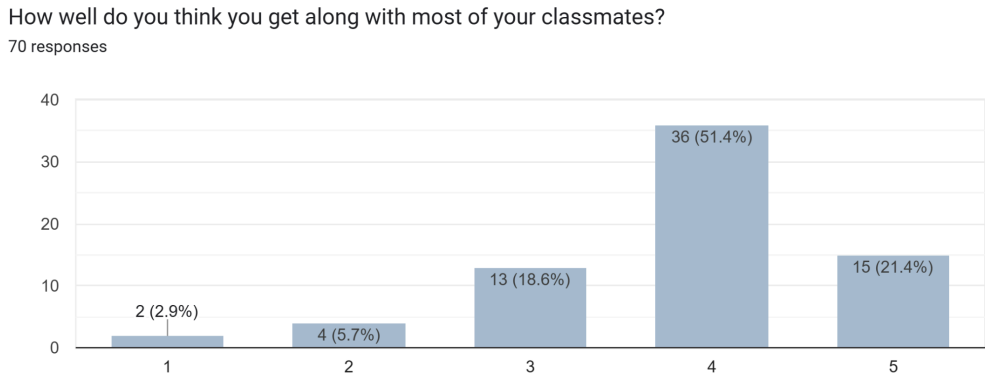

Figure 4.5: Responses to Question 5

Figure 4.6 shows students' comfort level when working in groups. Most of the students (40%) feeling "Somewhat comfortable" working with their classmates, this indicates that students generally feel confident collaborating in group settings.

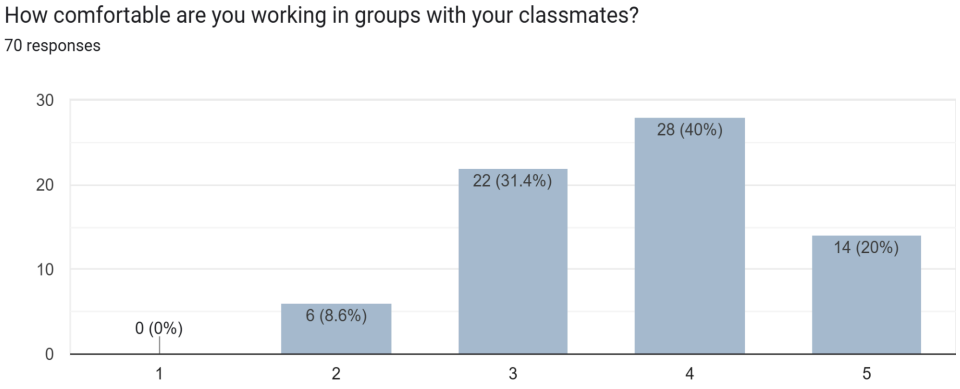

Figure 4.6: Responses to Question 6

Figure 4.7 shows responses regarding students' time and stress management during exams. Most respondents (40%) reported "Somehow well", this means they still need support.

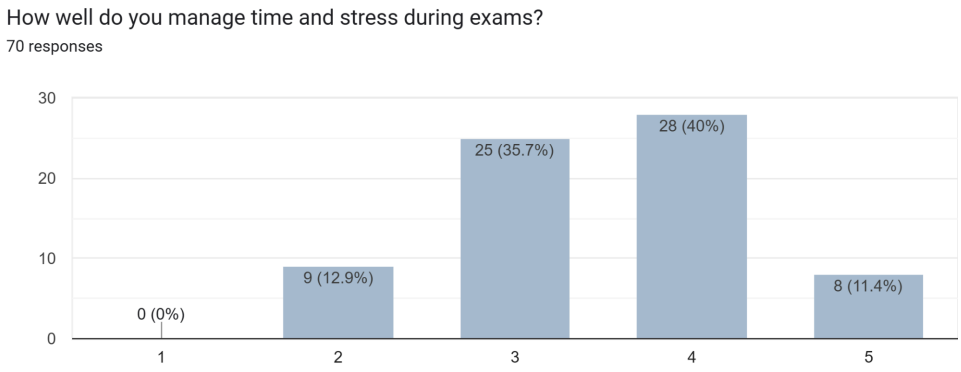

Figure 4.7: Responses to Question 7

Figure 4.8 shows students' strategies for dealing with stress. The highest proportion (77.1%) reported resting, followed by listening to music (52.9%) and using social media (50%).

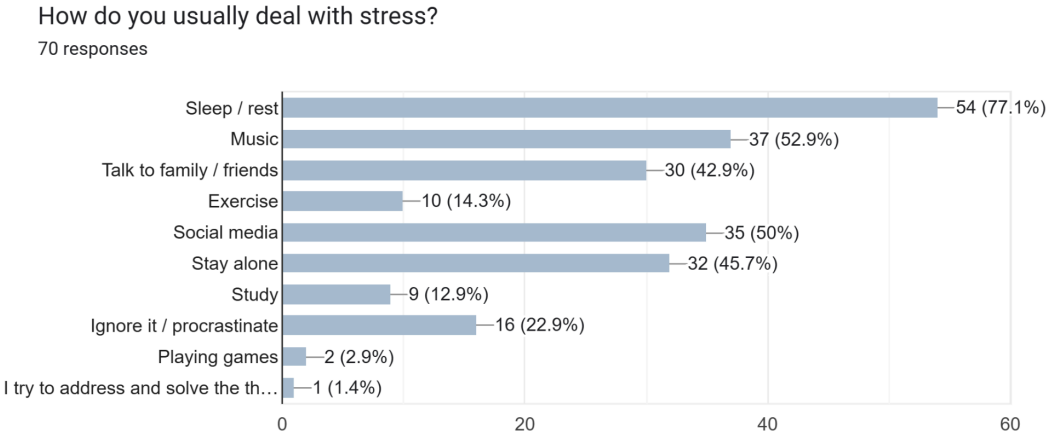

Figure 4.8: Responses to Question 8

Figure 4.9 shows the duration of rest taken by students during long study sessions. Most respondents (35.7%) reported taking 20-40 minutes, followed by 10-20 minutes (27.1%). Figure 4.8 shows that students commonly take short breaks during extended study periods.

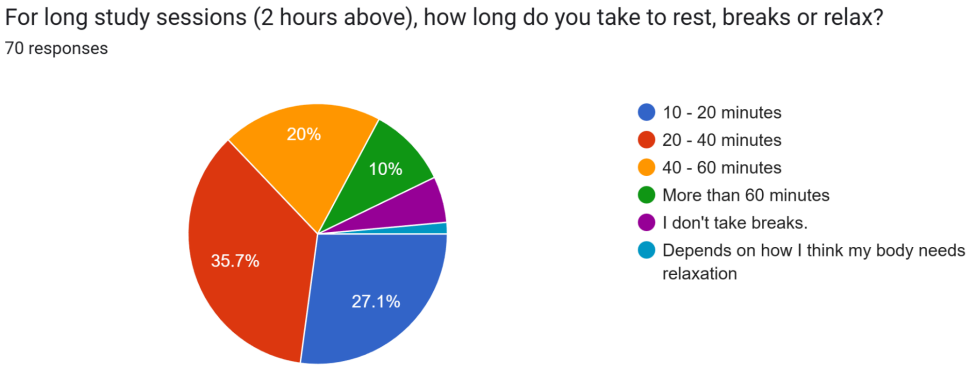

Figure 4.9: Responses to Question 9

Figure 4.10 shows students' perceptions regarding the usefulness of an app to monitor engagement. Almost half of the respondents (45.7%) agreed that having an app is very useful to track student stress level and wellness.

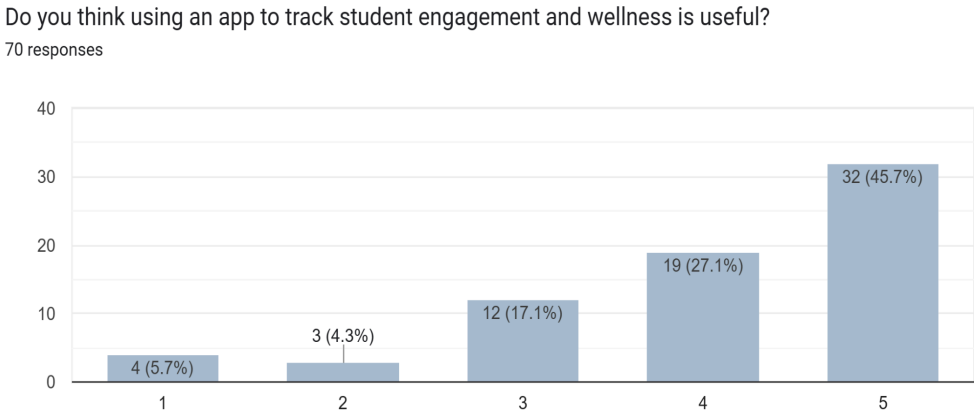

Figure 4.10: Responses to Question 10

Figure 4.0 - Figure 4.10:
Results gathered from Google Form

5.3 Ideate Phase

During this phase, a series of four (4) formal meetings was conducted to evaluate potential solutions based on the requirements identified in the previous stage. Figure 5.0 illustrates one (1) of these brainstorming sessions in progress, where various ideas for the mobile application's features and overall solution design are being discussed.

Figure 5.0: Brainstorming session

The following summarizes the selection process:

1. Evaluation of Proposed Ideas

A total of three (3) distinct concepts were developed and analyzed during the brainstorming session:

- Idea 1: A web-based peer support forum
- Idea 2: Automated academic warning system
- Idea 3 (Final Selection): A dedicated mobile application for tracking student metrics

2. Final Solution

The decision was reached to proceed with the development of a mobile application designed to monitor student motivation, stress levels, and engagement. Idea 3 was selected as the final solution based on the following criteria:

- Alignment with Objectives: It was determined to be the most effective method for addressing the core challenges identified in the initial research phase.
- User Accessibility: The mobile platform was prioritized due to its ease of use and high accessibility for the target student demographic.
- Data Accuracy: A digital interface allows for real-time tracking, ensuring more accurate data collection regarding student well-being compared to manual methods.

5.4 Prototype Phase

During the prototyping phase, the ideas from the brainstorming sessions were turned into a working model through two main steps. Throughout this process, every feature was carefully checked to make sure it met the students' needs, ensuring the final design remained simple, user-friendly, and effective for tracking wellness. First, hand-drawn sketches were created to quickly map out the basic layout and flow of the app. Figures 6.0 to 6.4 show the early hand-drawn layouts of the app.

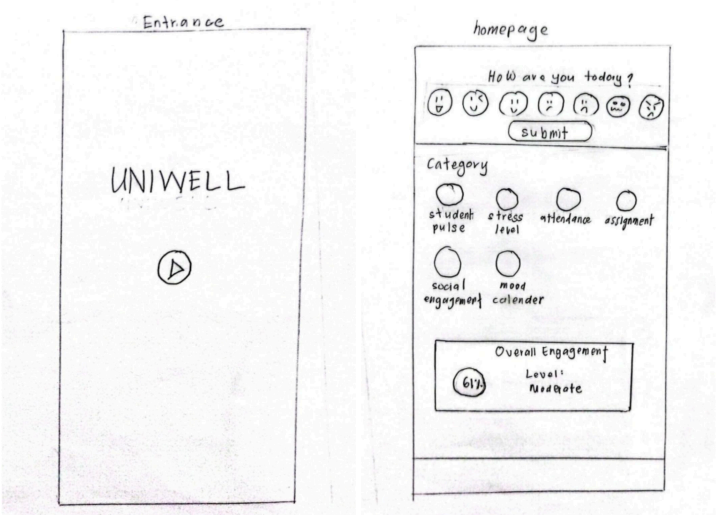

Figure 6.0: Main page & Homepage

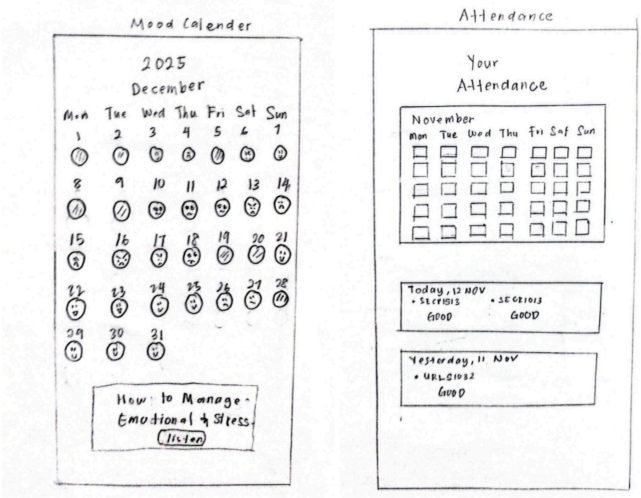

Figure 6.1: Mood Calendar & Attendance

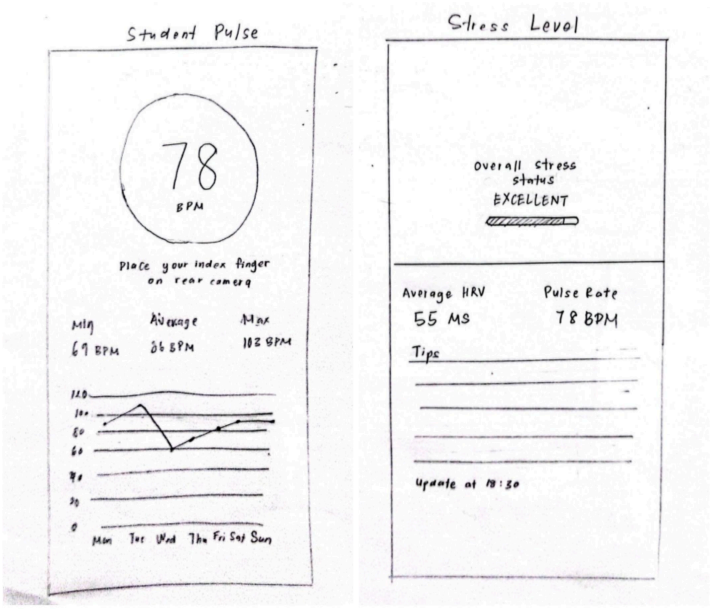

Figure 6.2: Student Pulse & Stress Level

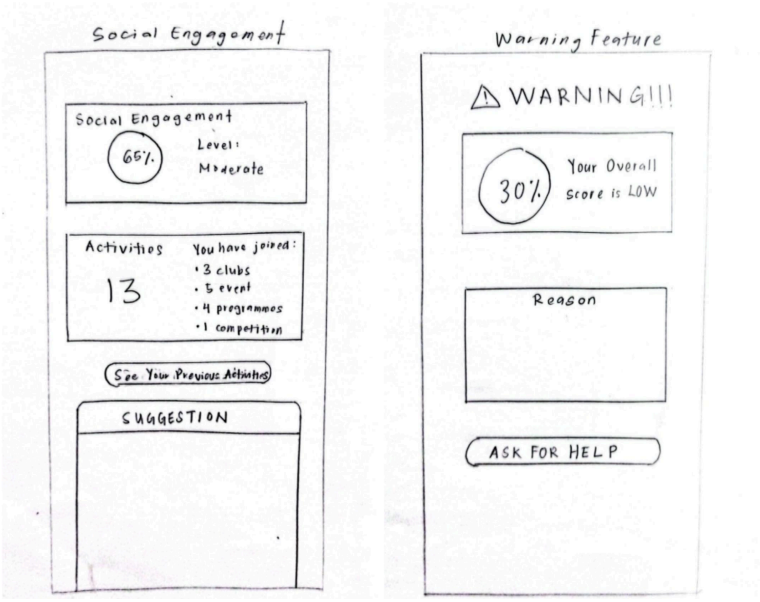

Figure 6.3: Social Engagement & Warning Feature

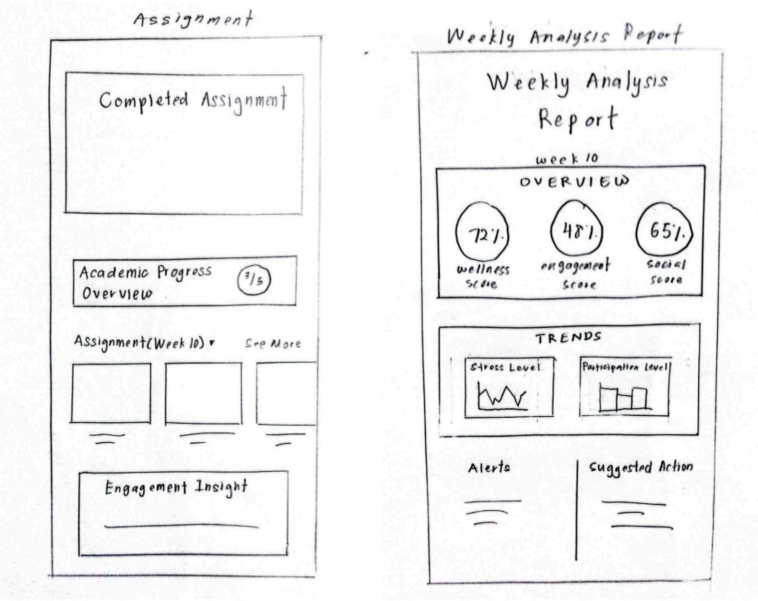

Figure 6.4: Assignments & Weekly Analysis Report

These sketches were then used to develop a more professional digital prototype using Canva, which provided a realistic look at the app's interface. Figures 6.5 to 6.9 present the high-fidelity digital model of the app. Figure 6.5 illustrates the main landing page and the homepage of the UniWell application. As shown in the homepage interface, the Overall Engagement feature synthesizes wellness, engagement, and social data into a composite weekly percentage, providing a high-level overview of the student's status.

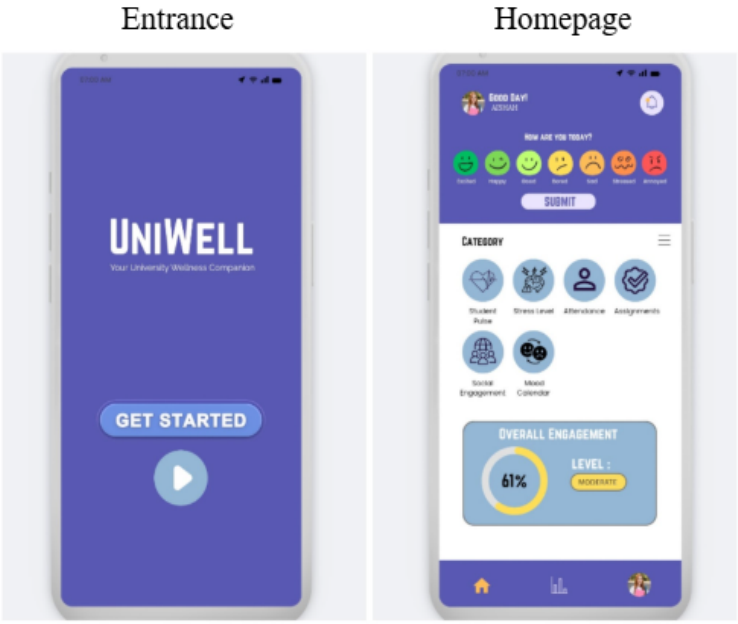

Figure 6.5: Main page & Homepage

Figure 6.6 displays the Mood Calendar report and the Attendance tracking module. The Mood Calendar is utilized to record emotional states over time, contributing to the assessment of the student's stress levels. Simultaneously, the Attendance module tracks academic and behavioral consistency by providing a visual record of class participation and absences.

Figure 6.6: Mood Calendar & Attendance

To monitor physiological and psychological health, the system includes a Pulse Rate monitor and a Stress Level indicator, both of which are integrated into the interface shown in Figure 6.7. The pulse monitor utilizes the device's rear camera to calculate heart rate metrics, including daily minimum, maximum, and average values. These results, combined with heart rate variability (HRV) and user feedback, allow the system to determine and display the student's current stress levels.

Figure 6.7: Student Pulse & Stress Level

Figure 6.8 shows the Social Engagement that records student participation and provides activity suggestions, while the Warning Alert mechanism is triggered automatically when overall engagement levels fall below a critical threshold. This alert identifies potential reasons for the decline and provides an 'Ask for Help' utility to facilitate direct contact with counselors.

Figure 6.8: Social Engagement & Warning Alert

Analytical overviews are provided through the Assignment and Weekly Analysis Report modules shown in Figure 6.9. The assignment feature manages ongoing tasks and provides automated reminders, while the analysis report utilizes histograms and weekly surveys to facilitate early detection of negative trends and encourage self-improvement through longitudinal data tracking.

Figure 6.9: Assignments & Weekly Analysis Report

5.5 Test Phase

The prototype was evaluated by three (3) students from the Faculty of Computing at Universiti Teknologi Malaysia (UTM). A high-fidelity interactive prototype, developed using the Canva platform, was utilized to assess the functionality of the proposed features. The students were provided with a digital link to the prototype, allowing for real-time interaction with the clickable elements and navigation menus. Each of the three (3) students was asked to test the application by completing four (4) specific tasks:

1. Interface Exploration: Navigating from the landing page to the main dashboard to assess visual clarity.
2. Task Input Simulation: Interacting with the digital academic planner to organize semester deadlines.
3. Stress Assessment Interaction: Utilizing the clickable stress-monitoring tool to record emotional states.
4. Resource Retrieval: Accessing the motivation and mental health support modules within the digital interface.

Before the students interacted with the digital interface, a technical briefing was conducted to outline the primary features of the application. Figure 6.0 documents the session where the features were explained to the students to ensure they understood the operational objectives of the test.

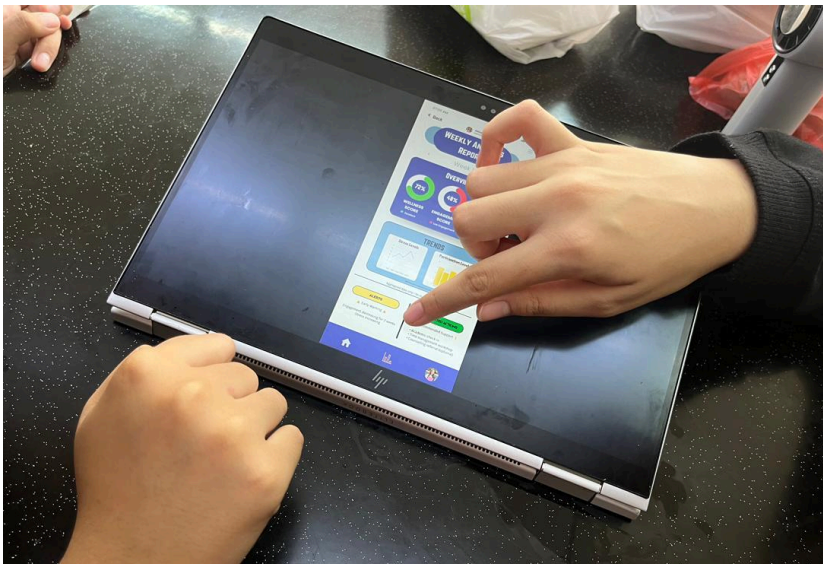

Figure 6.0: Technical briefing and explanation of application features

Figure 6.1 illustrates the students engaging with the digital interface during the evaluation session.

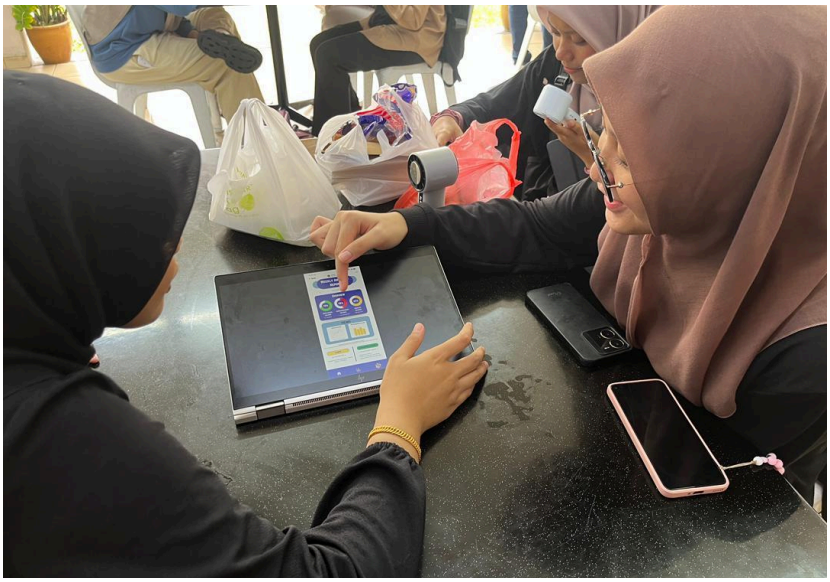

Figure 6.1: Students from the Faculty of Computing interacting with the digital prototype

5.5.1 Student Background and Feedback

The cohort consisted of three (3) students, all aged 19, from the Faculty of Computing. Following the interaction with the Canva prototype, the qualitative feedback was recorded as follows:

- Functionality: All three (3) students reported that the interface was navigable without external assistance.
- User Interface Design: Three (3) out of three (3) students indicated that the Canva-based interactive design was visually professional and facilitated easy recognition of features.
- Stress Management: Two (2) out of three (3) students stated that the automated reminder feature reduced anxiety regarding missed deadlines.
- Motivation: Three (3) students confirmed that the visual progress indicators increased their engagement with the application.

6.0 REFLECTION

1. Nur Nazirah Hanis binti Nazri (A25CS0319)

a. What is your goal/dream with regard to your course/program?

Nowadays, the industry does not only require knowledge but also strong technical and soft skills. Therefore, the goal of this course is to provide exposure to real working environments and to equip students with useful skills that will benefit their future careers. Through this course, knowledge in Computer Science is expected to be enhanced and social skills, particularly in communication and problem-solving.

b. How does this design thinking impact on your goal/dream with regard to your program?

Design thinking provides early exposure to the process of building a project. Step-by-step guidance on

how to develop a project is provided, and real experience in conducting a project is gained. Each phase in Design Thinking guides the project planning process effectively. Communication skills are enhanced through interviews, and teamwork skills are improved through collaboration with group members.

c. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To improve potential, continuous development of skills and knowledge is required. Activities can be joined and personal projects can be developed to enhance growth. Skills in conducting projects or programmes must also be strengthened, particularly in proper planning, execution, documentation, and presentation. In addition, improving teamwork skills is essential, as real working environments require collaboration within a team.

2. **Humayra' binti Zulqarnain (A25CS0068)**

a. What is your goal/dream with regard to your course/program?

The goal associated with the Bachelor of Computer Science (Data Engineering) program is the development of strong computational thinking skills, communication, data-oriented problem solving, creativity, and leadership. The emphasis on multidisciplinary topics is highlighted to support informed decision-making and the holistic growth of an individual to become a competent computer science graduate. In the long term, the program is offered as a pathway towards the contribution of innovative solutions to address complex challenges in modern industries in the future.

b. How does this design thinking impact on your goal/dream with regard to your program?

The application of Design Thinking provides a structured framework to approach problems from a human-centered perspective by collecting feedback and iterative processes such as ideation, prototyping, and evaluation. Analytical thinking and reasoning skills are strengthened using this methodology, all while reinforcing teamwork and communication between group members. Consequently, the ability to align technical practice with practical needs are met through the process of Design Thinking.

c. What is the action/improvement/plan necessary for you to improve your potential in the industry?

Potential within the industry can be improved by taking a balanced approach towards integrating continuous skill development, technical skills, and practical exposure. Focus is placed on system design, idea presentation, data handling and analysis, and communication within team members. Furthermore, active participation in activities, clubs, and discussions is essential to cultivate long-term growth and professional self-development through more peer connections and gained experience. Technical skills such as knowledge of database management and programming such as C++, Python, and Java are also important for relevance in industries.

3. Ng Xuan Yee (A25CS0291)

a. What is your goal/dream with regard to your course/program?

The primary objective regarding the Bachelor of Computer Science program is the development of communication proficiency to ensure confidence in public speaking. Furthermore, a concentrated interest is maintained in the domains of data analysis and web design. The long-term career goal

involves the mastery of modern technological tools to manage extensive datasets, facilitating a successful transition into the computer science industry.

b. How does this design thinking impact on your goal/dream with regard to your program?

The Design Thinking project served as a catalyst for improving problem-solving capabilities through the engagement with real-world challenges. During the data collection phase, one (1) digital tool (Google Forms) was utilized, which allowed for the practical application of data analysis techniques. Additionally, interpersonal competencies were enhanced through team-based collaboration. The exchange of ideas and the evaluation of diverse perspectives within the group directly supported the objective of becoming a professional data engineer.

c. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To enhance potential within the competitive technology industry, a strategic plan has been established to consistently improve both soft skills and technical competencies. Priority is placed on communication skills, which are to be refined through active participation in academic presentations and the maintenance of professional engagement during verbal interactions. Simultaneously, technical proficiency is to be strengthened in four (4) core areas, specifically C++, Java, HTML, and Microsoft 365, complemented by future participation in technical workshops to ensure skills remain aligned with the evolving industry landscape.

4. Nur Hanani Sazwani binti Muhammad Helmi Wan (A25CS0313)

a. What is your goal/dream with regard to your course/program?

Through the Bachelor of Computer Science programme skills in programming and professional communication are developed to prepare a competent computing professional. Emphasis is placed on acquiring theoretical knowledge and practical experience in designing and implementing technological solutions particularly within educational contexts. In the long term graduates are prepared to contribute meaningfully within advanced digital industries while continuous professional growth is encouraged.

b. How does this design thinking impact on your goal/dream with regard to your program?

The design thinking project was conducted to strengthen programming and communication skills by addressing challenges in student engagement and wellness. During the prototype development phase, a digital tool (Canva) was used to create and test application interfaces, allowing practical application of coding and system design concepts. Collaborative teamwork promoted effective communication and the exchange of ideas among group members. The iterative testing and refinement process emphasized user-centered design and practical problem-solving, thereby supporting the preparation of graduates for professional roles in the digital technology sector.

c. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To enhance potential within the technology industry, a structured plan has been adopted to continuously strengthen both technical and professional competencies. Priority is given to programming skills, to be developed through the creation of small-scale applications and refinement of system design techniques using tools such as Figma and GitHub. Communication and teamwork abilities are targeted for

improvement through active participation in group projects and presentations. In addition, ongoing engagement with emerging technologies and participation in workshops are planned to ensure skills remain relevant and aligned with industry demands.

7.0 TASK DISTRIBUTION

The project responsibilities were systematically distributed among the four (4) team members to ensure the efficient completion of the five (5) Design Thinking phases. As illustrated in Table 2.0, each member was assigned specific roles based on their technical expertise and individual strengths.

No.	Team Members	Task
1.	Nur Nazirah Hanis binti Nazri A25CS0319	● Prototype design ● Create survey form ● Report Writing (Detail Steps) ● Video editing
2.	Humayra' binti Zulqarnain A25CS0068	● Prototype design ● Conduct interviews ● Report Writing (Introduction, Conclusion)
3.	Ng Xuan Yee A25CS0291	● Prototype design ● Report Writing (Detailed Description, Design Thinking Evidence, Language Refinement) ● Create interview questions
4.	Nur Hanani Sazwani binti Muhammad Helmi Wan A25CS0313	● Prototype design ● Video editing ● Report Writing (Design Thinking Assessment Points) ● Videographer

Table 2.0: Task Distribution

8.0 CONCLUSION

Student engagement and well-being are considered crucial for maintaining academic success and overall growth. However, challenges such as stress and social engagement are often faced by students, which frequently go unaddressed due to the lack of an effective monitoring system.

Through the design thinking process, a low-fidelity prototype was developed across the phases of empathizing, defining, ideating, prototyping, and testing. Data was collected via Google Forms and interviews with students from various faculties, leading to the creation of both paper sketches and a Canva-based digital prototype to demonstrate the application's usage.

Key learning outcomes including an improved understanding of user-centered design and the

ability to translate qualitative feedback into system features were achieved. Additionally, creative and problem-solving skills, as well as teamwork and communication were enhanced, and the importance of iterative testing was highlighted to ensure the development of impactful, user-focused solutions.

9.0 REFERENCE

[1] Axelson, R. D., & Flick, A. (2010). Defining student engagement. *Change: The Magazine of Higher Learning*, *43*(1), 38–43. https://doi.org/10.1080/00091383.2011.533096

[2] Taylor, L. & Parsons, J. (2011). Improving Student Engagement. Current Issues in Education, 14(1). Retrieved from http://cie.asu.edu/

[3] Neagu, S. N., & Vieriu, A. M. (2025). Digital and Psychological Well-Being Among Technical University Students: Exploring the Impact of Digital Engagement in Higher Education. *Education Sciences*, *15*(9), 1192. https://doi.org/10.3390/educsci15091192

[4] World Health Organization. (2022, June 17). *Mental health*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

[5] Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, *45*(4), 249–257. https://doi.org/10.1080/00050067.2010.482109

[6] Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2019). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, *25*(1), 104–112. https://doi.org/10.1080/02673843.2019.1596823

[7] Conijn, R., Snijders, C., Kleingeld, A., & Matzat, U. (2017). Predicting Student Performance from LMS Data: A Comparison of 17 Blended Courses Using Moodle LMS. *IEEE Transactions on Learning Technologies*, *10*(1), 17–29. https://doi.org/10.1109/tlt.2016.2616312

[8] *What is Design Thinking?* (2016, May 25). The Interaction Design Foundation; IxDF - Interaction Design Foundation. https://www.interaction-design.org/literature/topics/design-thinking?srsltid=AfmBOork2Hn8XbmPqUzkO9t93PmU3vsMo3VyI4t8I4h6IRj0yG-JBq2R

VIDEO LINK

https://youtu.be/GthMQMXqYpA?si=kPf8D7esfwgwEOgm

APPENDIX A

Student Interviewee Profiles

The following profiles represent the four (4) students interviewed during the Empathy Phase.

Student 1

- Name: Muhammad Hafiz bin Suhaili
- Age: 19
- Faculty: Faculty of Computing

Student 2

- Name: Emir Hakim bin Suhaimi
- Age: 19
- Faculty: Faculty of Chemical & Energy Engineering

Student 3

- Name: Muhammad Rosham bin Samsulhadi
- Age: 19
- Faculty: Faculty of Chemical & Energy Engineering

Student 4

- Name: Liew Ying Xin
- Age: 19
- Faculty: Faculty of Chemical & Energy Engineering

APPENDIX B

Log Journal

The chronological progress of the project is documented in the table below, covering the period from 05 December 2025 to 16 January 2026. A total of four (4) formal meetings were conducted to facilitate the completion of the five (5) Design Thinking phases.

Date	Phase / Milestone	Activity Description	Outcome
05 Dec	Empathy	Meeting 1 was conducted via WhatsApp. The project direction was finalized and qualitative interview questions were generated.	Research objectives were established.
06 – 07 Dec	Empathy	Tasks were distributed among the four (4) members. Google Form survey questions were generated and distributed to six (6) UTM student groups.	Data collection commenced via WhatsApp / Telegram.
14 – 16 Dec	Define	Data collection was concluded. Analysis of the seventy (70) survey responses was performed, and interviews with four (4) UTM students were conducted.	The main problem was identified.
17 Dec	Define	Meeting 2 was held physically at N28A, Faculty of Computing. The problem statement was defined and report writing was initiated.	Project scope was formalized.
18 – 22 Dec	Ideate & Prototype	Meeting 3 was held via online. Development of prototype sketches and digital designs was started. Video editing was initiated upon prototype completion.	The UniWell prototype was finalized.
23 – 24 Dec	Review	Meeting 4 was held at the Student Lounge, Level 2 of N28. The prototype was presented to Dr. Aryati via WhatsApp for expert feedback.	Refinement suggestions were obtained.
29 Dec – 05 Jan	Test & Finalize	The Test Phase was conducted with three (3) UTM students. Final video editing and report writing were completed.	All project deliverables were finalized.
12 – 16 Jan	Presentation	Presentation slides were designed using Canva, and the final presentation was delivered on 16 January.	Final report corrections were completed.