

“MindMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being”

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ABSTRACT: MindMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being is an Android-based mobile application developed to support students in monitoring and managing their emotional health. The application enables users to log daily moods, engage in interactive mini-games, perform breathing exercises, and receive personalized mental health feedback. A key feature of the system is the integration of the standardized Depression, Anxiety, and Stress Scale (DASS-21), which allows structured emotional assessment and supports early detection of potential emotional risks. When elevated risk levels are identified, the system automatically generates notifications to inform the assigned guidance counselor, enabling timely awareness and intervention. MindMaze also incorporates gamification elements to enhance user engagement and encourage consistent participation in emotional self-monitoring. The application provides visual representations of mood trends and emotional progress, allowing users to reflect on their well-being over time. The system was developed using Android Studio as the development environment, with Firebase used for data storage and management. The application was evaluated using the ISO/IEC 25010 software quality standard in terms of functionality, reliability, usability, efficiency, portability, compatibility, maintainability, and security. The evaluation results yielded an overall grand mean of 4.28, interpreted as Excellent, indicating high system quality and effectiveness. These results confirm that MindMaze is a reliable, user-friendly, and secure tool for supporting emotional well-being among students. Formal implementation of the application is recommended to promote emotional awareness, early risk detection, and mental health support within academic institutions.

KEYWORDS: Mood Tracking, Gamified Mobile Application, Emotional Well-being, DASS-21, Mental Health Support

I. INTRODUCTION

Mental health issues are a problem for students these days. Students have to deal with a lot of pressure to do well in school. They also have to handle complicated situations and personal issues. This can cause students to feel really stressed, anxious, and sad. The World Health Organization said in 2022 that when students have problems like these, it can affect their schoolwork, motivation, and overall mental health. Mental health difficulties are a concern because they affect students' mental health and academic performances. Students with health difficulties, such as mental health issues, often struggle to keep up with their schoolwork and feel motivated. A critical barrier to timely support is the frequent hesitation of students to seek help or their difficulty in recognizing the early warning signs of emotional distress, which limits the effectiveness of proactive

intervention by guidance counselors. The demand for accessible and private self-monitoring tools has led to the emergence of mobile applications as convenient platforms for tracking emotional well-being (Torous et al., 2020). Mood-tracking applications specifically assist individuals in recording their daily emotions, identifying personal patterns, and developing emotional awareness. However, the core limitation of many existing mood trackers is their heavy reliance on self-reported feelings, which are inherently prone to being subjective, inconsistent, or inaccurate (de Korte et al., 2021). This lack of a standardized assessment mechanism severely compromises the reliability and consistency of the collected mood data, making it less dependable for formal emotional assessment and intervention planning. To establish a more consistent and accurate understanding of a student's emotional condition, integrating validated psychological instruments into the monitoring process is essential. The Depression, Anxiety, and Stress Scale (DASS-21), known for its strong reliability and evidence-based evaluation, is a widely used instrument in clinical and educational psychological screening. By integrating the DASS-21 with a daily mood-tracking system, the consistency and accuracy of the emotional data can be significantly improved, supporting a more objective assessment. Furthermore, user engagement is crucial for the sustained use of any self-monitoring application.

Research indicates that the appropriate use of gamification can significantly increase user interaction and encourage repeated use of mental health applications (Hamari et al., 2014; Sardi et al., 2023). Incorporating light game elements, such as relaxation mini-games, can make a mental health app more appealing, promote sustained user interest, and encourage regular emotional monitoring without detracting from its primary clinical purpose. This study addresses the aforementioned gaps by introducing MindMaze, a gamified mobile application designed to offer a comprehensive and reliable solution for student mental health monitoring. MindMaze integrates daily mood tracking with the standardized DASS-21 assessment to ensure data objectivity. Crucially, the system is designed to automatically notify guidance counselors when a student’s emotional well-being exceeds a predefined risk threshold. By strategically combining daily self-monitoring, a validated clinical assessment, and a direct channel for counselor intervention, MindMaze aims to improve emotional awareness among students, enhance the reliability of mental health monitoring, and facilitate early, evidence-based intervention within educational institutions.

Conceptual Framework

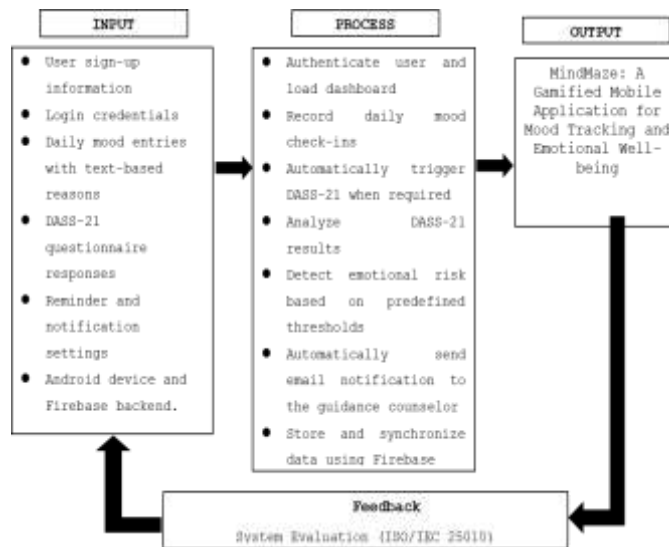


Figure 1: Conceptual Framework of MindMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being

Figure 1 illustrates the Input–Process–Output (IPO) conceptual framework that guides the design and development of the MindMaze mobile application. The input component includes user profile information, daily mood entries with text-based reasons, responses to the standardized Depression, Anxiety, and Stress Scale (DASS-21), and technical requirements such as an Android device, internet connectivity, and Firebase integration to support secure data storage and synchronization.

process component represents the core operations of the system. Upon login, the application authenticates the user and provides access to the dashboard. Users record daily moods, which may trigger scheduled or system-initiated DASS-21 assessments. The system analyzes mood entries and assessment results to determine emotional status and risk levels. When at-risk results are detected, an automated email notification is sent to the guidance counselor. All data are stored locally and synchronized with Firebase to ensure reliability. The output of the framework is a functional emotional monitoring application that generates structured mood records, standardized DASS-21 results, visualized mood trends, and automated counselor notifications. These outputs support emotional awareness and early detection of psychological distress. The feedback component is based on the ISO/IEC 25010 software quality standard. Evaluation results in terms of functionality, reliability, usability, efficiency, compatibility, portability, maintainability, and security serve as feedback for continuous system improvement.

Significance of the Study : This study is significant as it presents the design and development of MindMaze, a gamified mobile application that supports emotional well-being through structured mood tracking, standardized assessment using the Depression, Anxiety, and Stress Scale (DASS-21), and engagement-enhancing features

such as mini-games and reminders. The application provides students and young adults with an accessible and private tool for daily emotional self-monitoring, reflection, and awareness of emotional patterns. The generated mood logs and assessment results can serve as supplementary data for mental health professionals to support early detection of emotional risks and timely intervention. Moreover, the study supports educational institutions in strengthening their wellness programs by providing a digital platform that promotes emotional resilience and early identification of students who may need support. At a broader level, this research contributes to the field of digital mental health by demonstrating how gamification, validated psychological assessment, and user-centered mobile design can be effectively integrated into a single system to enhance user engagement, improve reliability of emotional monitoring, and support preventive mental health care.

II. METHODOLOGY

Research Design : This study employed a **developmental-descriptive research design** in the development and evaluation of *MindMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being*. The developmental aspect focused on the systematic design, implementation, and testing of the mobile application, while the descriptive component was utilized to evaluate the system's performance and effectiveness based on user feedback. The study aimed to develop a mobile-based emotional wellness monitoring system that integrates daily mood tracking, standardized emotional assessment using the DASS-21 instrument, mini-game engagement features, reminder notifications, and an automated counselor alert mechanism. The research design allowed the researchers to observe, describe, and analyze the system's functionality, usability, reliability, and overall performance without manipulating user behavior. The evaluation of the system was conducted using the ISO/IEC 25010 software quality model, assessing key quality characteristics such as functionality, usability, efficiency, reliability, compatibility, portability, maintainability, and security. This design ensured that the developed system was both technically sound and responsive to the emotional wellness needs of students.

Respondent and Sampling Technique : To ensure the reliability and relevance of the evaluation results, the study employed a purposive sampling technique in selecting participants who had direct involvement and interaction with the MindMaze application. A total of 36 respondents participated in the study, consisting of 30 students, 5 IT experts, and 1 guidance counselor. The students served as the primary users of the system and were chosen because they represent the target beneficiaries of the application. They actively tested the system's features, including mood logging, DASS-21 assessment, mini-games, reminder notifications, and statistics monitoring. The IT experts were included to evaluate the technical quality of the system, particularly in terms of functionality, performance efficiency, reliability, and maintainability. Meanwhile, the guidance counselor assessed the appropriateness of the emotional assessment integration, risk-level detection, and the automated notification mechanism. The use of purposive sampling ensured that all participants had adequate experience using the system prior to completing the evaluation questionnaire, thereby enhancing the validity and credibility of the collected data.

Research Instrument : The primary data gathering instrument used in this study was a structured evaluation questionnaire based on the ISO/IEC 25010 software quality model. The questionnaire was designed to assess the overall quality and performance of the MindMaze application. It was divided into two main parts. The first part gathered the demographic information of the respondents, including their user classification as students, IT experts, or guidance counselor. The second part evaluated the application according to the key software quality characteristics defined under ISO/IEC 25010, namely functionality, reliability, usability, efficiency, compatibility, portability, maintainability, and security. Each statement in the questionnaire was rated using a 5-point Likert Scale, where 5 indicated Excellent, 4 Very Good, 3 Good, 2 Fair, and 1 Poor. Prior to distribution, the instrument underwent expert validation to ensure clarity, relevance, and alignment with the objectives of the study. The collected responses were statistically analyzed using the weighted mean to determine the overall performance rating of the system.

Software Development Methodology : The researchers proposed the use of the Agile Software Development Life Cycle (SDLC) methodology in the development of the MindMaze application. Agile was selected due to its iterative and flexible approach, allowing continuous improvement, regular testing, and integration of user feedback throughout the development process. This methodology ensured that system features were developed systematically, refined efficiently, and aligned with the objectives of delivering a reliable and user-centered mobile application for emotional well-being.



Figure 2: Software Development Life Cycle

Requirements Gathering: Identification of system features such as mood tracking, DASS-21 assessment integration, mini-games, reminder scheduling, and automated counselor notification. **System Analysis and Design:** Development of UML diagrams including Use Case, Class, Sequence, and Deployment Diagrams. The database structure was designed using Firebase Firestore to manage user profiles, mood entries, assessments, reminders, and notification logs.

Development and Implementation: The system was developed using Android Studio with Java and XML. Firebase Authentication and Firestore were integrated for secure login and real-time data synchronization. Gmail SMTP was implemented to enable automated email notifications when at-risk DASS-21 results were detected. **Testing and Integration:** Functional testing, integration testing, and usability testing were conducted to ensure accurate score computation, stable system performance, proper offline data storage, and reliable synchronization. **Deployment and Maintenance:** The application was deployed on Android devices for pilot testing. Maintenance procedures include bug fixing, feature enhancement, and performance monitoring to ensure long-term system stability. This methodology ensured that MindMaze was developed systematically, tested thoroughly, and evaluated objectively according to established software quality standards.

III. VI.RESULT AND DISCUSSION

This chapter presents and discusses the results of the MindMaze mobile application and its evaluation. MindMaze was designed to function as a gamified emotional wellness system that allows users to track their moods, engage with supportive activities, and view their emotional progress over time. The system provides users with tools such as mood logging, journaling, breathing exercises, mini-games, and an AI-based chatbot, all of which aim to support emotional regulation and self-awareness. The application interface allows users to log their emotional state through mood icons and optional journal entries. The app also provides personalized recommendations based on the user’s mood, especially when negative emotions are detected. These recommended activities help users manage stress, practice mindfulness, or temporarily divert attention through interactive mini-games. The software is designed to be easy to use: users only need to open the app to record their mood, view progress charts, or access wellness tools.

Table 1. Overall System Performance of MindMaze

Criterion	Grand Mean	Description
Functionality	4.2	Very Good
Reliability	4.00	Very Good
Portability	4.35	Excellent
Usability	4.51	Excellent
Compatibility	4.49	Excellent
Efficiency	4.23	Excellent
Maintainability	3.93	Very Good
Security	4.51	Excellent
Overall Grand Mean	4.28	Excellent

Overall Result of the System Performance Using ISO 25010

As shown in Table 1, the overall evaluation of *MindaMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being* based on the ISO 25010 software quality standard indicates that the system performed very well to excellently across the evaluated quality characteristics. The respondents rated the system's Functionality with a mean of 4.20, Reliability at 4.00, and Maintainability at 3.93, all of which were interpreted as Very Good. Meanwhile, Portability obtained a mean of 4.35, Usability at 4.51, Compatibility at 4.49, Efficiency at 4.23, and Security at 4.51, all interpreted as Excellent. Overall, the system achieved an Overall Grand Mean of 4.28, which is interpreted as Excellent based on the adopted evaluation scale. These results demonstrate that *MindaMaze* effectively meets the ISO 25010 quality standards, particularly in terms of usability, security, compatibility, and efficiency. The consistently high ratings across the evaluated criteria confirm that the application is reliable, secure, user-friendly, and suitable for real-world deployment as a mental health support tool for students.

IV. CONCLUSIONS

Based on the results of the study, *MindaMaze: A Gamified Mobile Application for Mood Tracking and Emotional Well-being* successfully achieved its intended objectives. The system demonstrated high levels of functionality, reliability, and usability, and it provided accurate and timely mental health insights. Users found the app intuitive, responsive, and secure, which supports the conclusion that *MindaMaze* is a practical and effective tool for promoting emotional well-being among students. The system also reduces manual monitoring efforts, encourages consistent self-reflection, and offers a structured approach for students to engage with their mental health.

RECOMMENDATIONS

1. Based on feedback from IT experts, the user interface of *MindaMaze* may be further improved by refining visual alignment, enhancing layout consistency, and adopting a more modern design style to improve usability and aesthetic appeal. These refinements can enhance user engagement and provide a more polished user experience.
2. Based on recommendations from the guidance counselor, a separate dashboard for counselors may be developed to allow secure viewing of aggregated risk alerts and student status. Alternatively, the use of an official institutional email account for notifications may be implemented to ensure professionalism, data privacy, and proper case handling.
3. *MindaMaze* can be extended to other departments and campuses through institutional adoption or IT development initiatives. Its intuitive design, interactive features, and adaptability make it suitable for various student populations. Other academic units can benefit from the app's structured mood tracking, gamification, and insights, enhancing students' emotional awareness and overall well-being.

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