Corner - Mental Health Web Based Platform

¹Arya Pawar, ²Sidharth Salian, ³Saad Shaikh, ⁴Sarib Siddiqui, ⁵Prof.Deepa Agrawal

¹UG Scholar, ²UG Scholar, ³UG Scholar, ⁴UG Scholar, ⁵Assistant Professor ¹Artificial Intelligence and Data Science, ¹Rajiv Gandhi Institute of Technology, Mumbai, India

1aryapawarwork@gmail.com, 2sidharthsalian0801@gmail.com, 3saadshaikh1609@gmail.com_,
4saribnaeemsiddiqui@gmail.com, 5deepa.agrawal@mctrgit.ac.in

Abstract— Corner: Mental Health Platform is a web-based solution designed to support students' mental well-being through AI-driven tools. It features an AI chatbot powered by LLaMA 3.3-7TB-Versatile, offering empathetic conversations and guidance, along with a questionnaire-based stress tracker that categorizes stress levels and a clinically validated depression tracker to assess emotional health. By integrating AI-driven insights with psychological techniques, Corner enhances self-awareness, resilience, and accessibility to mental health support, helping students manage stress, anxiety, and personal challenges effectively.

Index Terms— Mental Health, Students, AI-Powered, Wellness Companion, Stress Tracker, Depression Tracker, AI Chatbot, LLaMA 3.3-7TB-Versatile

I. INTRODUCTION

Mental health is a crucial aspect of students' well-being, yet many struggle with stress, anxiety, and emotional challenges due to academic pressure, social expectations, and personal difficulties. Limited access to professional support often worsens these issues, leading to emotional distress and burnout. Traditional mental health resources, such as counseling services and self-help materials, provide some relief but lack real-time, personalized support. Advances in artificial intelligence (AI) are transforming mental health care by offering intelligent, accessible, and adaptive solutions. AI-driven platforms can analyze emotional patterns, provide real-time insights, and deliver tailored interventions, ensuring timely support without requiring constant professional involvement.

Recognizing the need for a comprehensive mental wellness solution, Corner is an AI-powered platform designed to support students' mental health. It integrates three core features: an AI chatbot, a stress tracker, and a depression tracker. The AI chatbot, powered by LLaMA 3.3-7TB-Versatile, offers empathetic and intelligent conversations for stress relief and personalized guidance. The stress tracker assesses stress levels through a questionnaire-based system, categorizing them as Mild, Medium, or Chronic, while the depression tracker utilizes clinically validated assessments to detect potential signs of depression. By combining AI-driven mental health insights with evidence-based psychological techniques, Corner fosters self-awareness, resilience, and proactive self-care. Its user-friendly interface not only helps individuals manage their mental health but also promotes broader mental health awareness and reduces stigma, making emotional support more accessible and sustainable.

II. Related Work

1. Application of AI in the Mental Health Domain

AI has transformed mental health care by improving assessment, monitoring, and treatment through machine learning, natural language processing (NLP), and predictive analytics. AI-powered chatbots like Woebot, Wysa, and Replika use NLP to provide cognitive behavioral therapy (CBT)-based support, while sentiment analysis detects early mental health concerns by analyzing language and tone. Additionally, stress and depression tracking systems leverage machine learning to interpret questionnaire responses and physiological signals, offering personalized insights.

Beyond chatbots, AI aids in early diagnosis and risk prediction by analyzing electronic health records (EHR) and behavioral data to detect conditions like depression and schizophrenia. Digital phenotyping, which monitors sleep patterns and smartphone usage, enables continuous mental health assessment. However, challenges such as ethical concerns, data privacy risks, and algorithmic biases must be addressed to ensure transparency, accuracy, and trust in AI-driven mental health solutions.

2. Existing Research on AI-Based Mental Health Platforms

Several studies have explored the effectiveness of AI-driven mental health applications, emphasizing their potential in providing scalable and accessible psychological support. The "Efficacy of AI Chatbots in Cognitive Behavioral Therapy (CBT)" study analyzed AI-powered CBT interventions, demonstrating a 78% reduction in self-reported anxiety levels after four weeks of chatbot-guided therapy. However, limitations in recognizing complex emotional states were identified, suggesting the need for improved sentiment analysis models. Similarly, "AI-Based Mood Tracking and Personalized Mental Health Insights" examined daily emotional logging systems, where AI-driven mood assessments led to a 65% increase in user engagement compared to traditional self-guided tools.

The "Impact of AI-Driven Meditation and Mindfulness on Stress Reduction" study evaluated the role of guided meditation apps in enhancing mental well-being, reporting a 40% improvement in stress management among regular users. Findings emphasized the importance of personalized meditation recommendations to optimize emotional regulation [3]. Another work, "Online Therapy and AI-Powered Therapist Matching: A Comparative Analysis", explored machine learning algorithms used for therapist selection in digital therapy platforms, achieving a 75% accuracy in matching users with appropriate mental health professionals based on their psychological needs .

Further, studies such as "AI-Enhanced Peer Support in Mental Health Apps: A Community-Based Approach" analyzed AI-driven community engagement, showing a 50% increase in user retention when interactive peer support was integrated with automated mental health guidance. The "Security and Privacy in AI-Based Therapy: Ensuring Confidentiality in Digital Mental Health Platforms" study examined encryption techniques and data security measures, underscoring the need for transparent privacy policies to improve user trust and adoption rates.

3. Advanced AI Techniques in Mental Health Platforms

Research into AI-driven mental health support systems has evolved to incorporate multiple advanced techniques:

- Natural Language Processing (NLP) for AI Chatbots: Studies have explored NLP-based chatbot systems using word embeddings and sentiment analysis to enhance therapeutic conversations and provide personalized CBT recommendations.
- Reinforcement Learning for Personalized Therapy: AI models using reinforcement learning enable adaptive mental health interventions, allowing users to refine chatbot interactions and coping strategies through feedback mechanisms.
- AI-Enhanced Emotion Classification: Various classifiers, including Naïve Bayes, Logistic Regression, and Random Forest, have been tested for mood detection, with Linear SVC achieving the highest accuracy (79%) in identifying user emotions.
- AI-Based Mood and Stress Prediction: Deep learning models like LSTMs and ResNet-50 have been used for real-time emotion recognition, extracting stress patterns from text, voice, and biometric inputs to improve therapy recommendations.
- Hierarchical AI for Structured Therapy Guidance: LSTM-based hierarchical neural networks structure mental health assessments, self-help exercises, and therapy recommendations in a coherent and personalized manner.
- Neural Network Language Models for Mental Health Insights: Encoder-decoder architectures and transformer-based models analyze user input to generate personalized therapy suggestions, with skip-gram models improving emotional sentiment tracking.
- GAN-Based Mental Health Simulations: Generative Adversarial Networks (GANs) have been explored for creating Aldriven mental health scenarios, simulating conversational responses that adapt based on user behavior and mood.

4. Comparative Analysis and Research Gaps

While previous studies have explored AI-driven mental health chatbots, emotion classification, and therapy recommendation models, most focus on isolated aspects of mental health support. A comprehensive approach integrates AI-powered chat therapy, stress and depression tracking, and personalized mental health insights into a single platform. Unlike solutions that rely solely on self-guided tools or static assessments, an adaptive system combines real-time emotional analysis, AI-driven responses, and evidence-based psychological techniques to deliver tailored support. This holistic approach bridges the gap between existing research and real-world mental health needs, making AI-driven mental health platforms more dynamic and accessible for users.

III. FINDINGS AND DISCUSSION

1. Analysis:

The findings indicate that the integration of AI into student mental health support through Corner is a promising solution to address accessibility gaps in psychological care. The platform demonstrated a strong ability to deliver personalized and empathetic support, offering mental wellness tools that are effective, relatable, and user-centric. Several key points emerge from the analysis of the findings:

1.Emotional Relevance: One of the platform's core strengths is its ability to respond to the emotional and psychological needs of students. By using supportive language and context-aware responses, Corner maintains a tone of understanding and care. The design respects the sensitivity of mental health issues, creating a safe and inclusive environment for users to express their feelings.

- 2.Personalization: Corner stands out with its personalized approach to mental wellness. Unlike traditional platforms, it adapts based on individual user input, providing tailored support through features like the AI chatbot, stress tracker, and depression tracker. This dynamic interaction enables users to receive guidance aligned with their emotional state, lifestyle, and mental health goals.
- 3.Scalability and Future Applications: Corner's flexible framework allows for expansion beyond student populations. Its core design—focused on personalized mental health insights and real-time emotional support—can be adapted to other demographics, such as working professionals or adolescents. The underlying model can be tailored to address group-specific mental health needs, making it a scalable and impactful solution in broader wellness contexts.

2 .Research Gaps

While the findings demonstrate the effectiveness of AI in supporting student mental health through Corner, several challenges and areas for future improvement were identified during the study:

- 1.Lack of Human Interaction: As an AI-driven platform, Corner lacks real-time human support, which may be a limitation for users needing deep emotional connection or professional counseling. While the chatbot provides empathetic responses, it may not fully replace the understanding and nuanced interaction offered by a trained therapist in more complex cases.
- 2.Limited Scope of Therapy: While Corner effectively addresses stress and emotional well-being through tools like the chatbot, stress tracker, and depression tracker, it does not currently provide live therapy or personal counseling. This may limit its usefulness for individuals with more severe mental health conditions who require intensive therapeutic support.
- 3.Reliance on Self-Guided Tools: Corner's model is primarily self-directed, which may not meet the needs of users who prefer structured guidance or regular check-ins with mental health professionals. While it is beneficial for building self-awareness, users facing serious issues might find the lack of direct expert involvement less effective.
- 4.Response Limitations: Although the chatbot offers timely support, the responses may sometimes lack depth or personalization in more complex emotional scenarios. This can be a concern for users expecting immediate and nuanced assistance, especially in high-stress situations where human judgment may be more effective.
- 5.Future Expansion Needs: Corner's current focus is on student populations. While its adaptable framework shows promise, future development is needed to cater to other groups such as working professionals, teenagers, or the elderly. Expanding user-specific content and refining emotional response mechanisms would enhance its reach and impact.

This evaluation highlights Corner's potential as a powerful mental wellness tool. However, further development and refinement—particularly in personalization, human integration, and demographic scaling—are necessary to ensure it evolves into a more comprehensive and inclusive mental health support system.

IV. PROPOSED SYSTEM

1. System Architecture

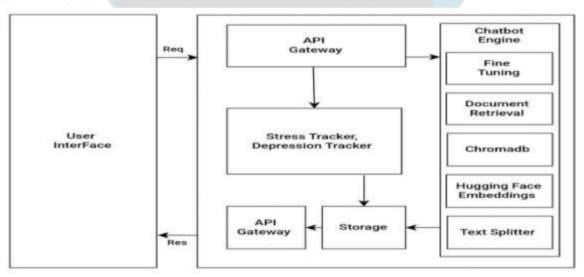


Fig. 1: System Architecture

Figure 1 shows the system architecture of Corner: A mental health web based platform consists of several layers and components working together to deliver a seamless user experience.

1.User Interface (UI) Layer

This layer serves as the front-end of the platform, enabling users to interact with the system seamlessly. It includes various functionalities:

- Home Page & Dashboard: Provides an overview of the user's mental health status, latest chatbot interactions, and insights from the stress and depression trackers.
- Chatbot Interface: Enables users to interact with an AI-driven chatbot for mental health support and guided conversations.
- Stress & Depression Tracker: A questionnaire-based tool that evaluates user stress and depression levels, offering insights based on responses.
- Personalized Recommendations: Suggests mental wellness resources, relaxation techniques, and self-care activities based on user interactions.

2. Backend Services

This layer contains the core business logic, handling requests from the front-end and processing user data.

- Gateway: Acts as the central entry point for user requests, routing them to appropriate services securely and efficiently.
- Stress & Depression Tracker Service: Processes user responses to mental health assessments and generates reports on stress and depression levels.
- Chatbot Engine: A conversational AI model designed to provide guided mental health support.
- Fine-Tuning Module: Improves chatbot performance through user feedback and data refinement.
- Document Retrieval: Fetches relevant mental health resources in response to user queries.
- ChromaDB: A vector database for storing and retrieving mental health-related embeddings for improved chatbot responses.
- Hugging Face Embeddings: Utilized to enhance the chatbot's understanding of user queries.
- Text Splitter: Breaks down large text inputs for efficient processing and retrieval.

3. Database & Storage Layer

This layer is responsible for securely storing and managing user data.

- Storage Service: Stores user responses, chatbot interactions, and historical tracker data for personalized insights.
- ChromaDB: Maintains structured embeddings to support fast and accurate retrieval of relevant mental health resources.

External & API Services

The system integrates with external tools to enhance its functionality.

- API Gateway: Manages API requests from the UI and backend services, ensuring smooth communication.
- External Mental Health Resources: The platform may integrate with third-party services for additional self-help content, relaxation techniques, or professional counseling options.

V. EXPERIMENTAL SETUP

1. Algorithm

A. Information Retrieval Algorithm

The chatbot utilizes ChromaDB as a high-dimensional vector database and an AI-driven Retriever Model to enhance response accuracy and personalization. This system ensures chatbot interactions are contextually relevant, scientifically validated, and personalized for user needs.

Efficient Similarity Search: Converts user queries and journal entries into vector representations, retrieving the most relevant mental health content.

Retrieval-Augmented Generation (RAG): Combines factual information from ChromaDB with LLM-generated responses to minimize misinfrmation.

Dynamic and Personalized Content Retrieval: Recommends therapy exercises, coping techniques, and self-care strategies based on user history and mood tracking. Multi-Pass Query Processing: Initially fetches broadly relevant content, then refines results for higher accuracy. Memory Optimization: Recalls past interactions to ensure long-term engagement and reinforce personalized therapy suggestions. Hallucination Prevention: Ensures responses are grounded in verified mental health resources rather than speculative AI-generated text.

B. Large Language Model (LLM)

Corner uses a Large Language Model (LLM) to power its mental health features and create meaningful, personalized interactions with users. The system processes various types of input—such as mood entries, stress levels, and journal responses—to generate supportive and empathetic feedback that promotes emotional well-being and self-awareness. The LLM enables Corner to understand user intent, emotional tone, and mental health patterns to deliver tailored support strategies and conversational guidance.

- Data Collection & Preprocessing Collect and clean user-generated data, including questionnaire answers, journal entries, and chatbot interactions. Normalize and tokenize the text for analysis.
- Model Fine-Tuning Use a pre-trained LLM and adapt it for mental health support using curated datasets on psychological conversations, coping strategies, and emotional expression.
- Emotion & Context Understanding Apply emotion recognition and context analysis to interpret user sentiment, stress markers, and psychological distress in conversations.
- Support Strategy Generation Generate context-aware coping strategies, self-care tips, and structured feedback using advanced NLP techniques.
- Mental Health Personalization Adapt responses based on user history, mood patterns, and individual goals to offer personalized mental wellness support.

- Verification & Refinement Validate emotional alignment, coherence, and therapeutic appropriateness of responses; improve via expert review and user testing.
- User Feedback Loop Incorporate user ratings, feedback, and interaction patterns to refine emotional responses and personalize future recommendations.

C. Machine Learning-Based Text Processing

The Recursive Character Text Splitter enhances AI-driven responses by breaking down large mental health documents into smaller, retrievable chunks, improving searchability, optimizing vector search, and enabling efficient multi-turn conversations. Transformer-Based Query Processing leverages deep learning to embed user queries into dense vector spaces, ensuring context-aware search optimization, enhanced query matching, and improved conversational memory. Together, these techniques ensure chatbot responses are precise, emotionally supportive, and tailored

2. Methodology

- Requirement Analysis: Identify user needs related to mental health support, including stress tracking, emotional journaling, and AI-based conversation. Understand key features such as mood monitoring, coping strategy suggestions, and personalized mental health insights to ensure user-centered development.
- System Design: Design the platform's architecture, database schema, and user interface with a focus on accessibility, privacy, and user engagement. Ensure the design supports scalability, responsive UI, and smooth interaction across all mental health tools.
- Algorithm Development: Create intelligent algorithms for mood detection, stress evaluation, and adaptive conversation flow. Optimize for emotional accuracy, response relevance, and personalization across different user profiles.
- Implementation: Develop the platform using defined technologies, integrating front-end (React), back-end (Express/Node.js), AI models (via Groq), and data storage systems. Ensure seamless interaction between chatbot, trackers, and journaling modules.
- Testing and Validation: Conduct rigorous testing to validate emotional response accuracy, mental state assessments, and overall user experience. Refine functionalities iteratively based on usability testing and expert feedback.
- Deployment: Deploy the platform to a secure and scalable cloud environment, ensuring high availability, data protection, and user confidentiality.
- Maintenance and Updates: Continuously improve the system with new features, updated mental health techniques, and enhanced AI models. Integrate user feedback to keep the platform responsive to evolving user needs.

This methodology supports the creation of a reliable and empathetic mental health platform. Starting from user-focused planning through intelligent design and adaptive implementation, Corner aims to deliver personalized and effective mental wellness support.

3. Implementation

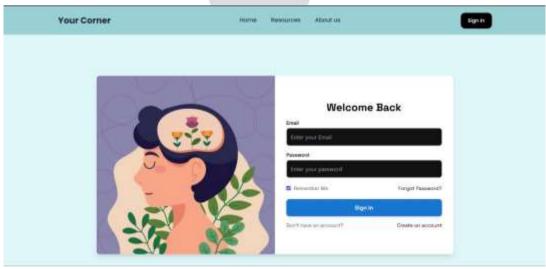


Fig. 2: Login Page

Figure 2 showcases the Login Page of the Corner platform, designed to offer a welcoming and calming experience for users seeking mental health support. The interface combines a soft colour palette with a thoughtful illustration of a person with flourishing plants inside their mind, symbolizing growth and emotional well-being. On the right, users can securely enter their email and password to access their personalized space, with features such as a "Remember Me" option and links for password recovery and new account creation. The clean and intuitive layout enhances usability, while the imagery reflects Corner's core mission—nurturing mental health through empathy, simplicity, and user-centered design.

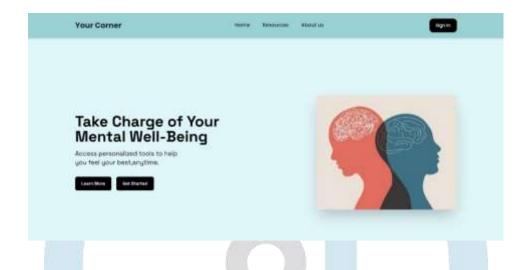


Fig. 3: Home Page

Figure 3 depicts the Home Page of the Corner platform, serving as the user's gateway to personalized mental health support. The design features a balanced layout with a bold call-to-action message—"Take Charge of Your Mental Well-Being"—positioned alongside a compelling visual of two heads symbolizing dual aspects of the mind: clarity and confusion. The clean, minimal interface invites users to explore resources and begin their journey toward improved mental wellness with accessible buttons for "Learn More" and "Get Started." This landing page embodies Corner's mission to empower individuals through intuitive access to mental health tools and a visually soothing experience.

Our Key Features!

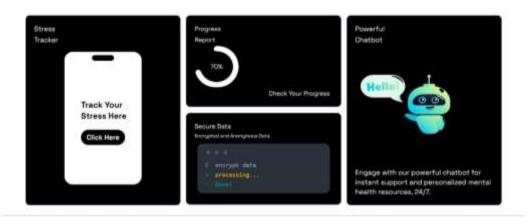


Fig. 4: Key Features

Figure 4 showcases the Key Features section of the Corner platform's homepage, highlighting user-centric tools for personalized mental health support. The section features a clean, grid-based layout with dark-themed cards that stand out. Among the standout tools is a Stress Tracker, a questionnaire-based utility that helps users assess and monitor stress levels easily. Another core feature is the Powerful Chatbot, built using LLaMA 3.3 Versatile, offering round-the-clock, AI-driven emotional support and tailored mental health guidance. The platform also emphasizes Secure Data, with encryption ensuring all user information remains anonymous and protected. These features embody Corner's mission of delivering accessible, private, and intelligent wellness support.

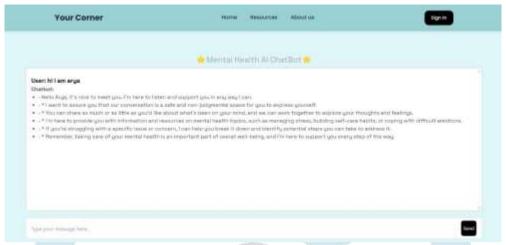


Fig. 5: Chatbot

Figure 5 illustrates the Chatbot section of Corner, a mental health support platform. This interactive space allows users to engage with a Mental Health AI ChatBot powered by LLaMA 3.3 Versatile, designed to offer empathetic, non-judgmental support. Upon greeting the chatbot, the user is met with a warm, reassuring response, emphasizing safety, confidentiality, and personalized assistance. The minimalist interface includes a clear dialogue display, a message input field, and a "Send" button, reinforcing ease of use. This section exemplifies Corner's commitment to making mental health support accessible and compassionate through cutting-edge AI technology.

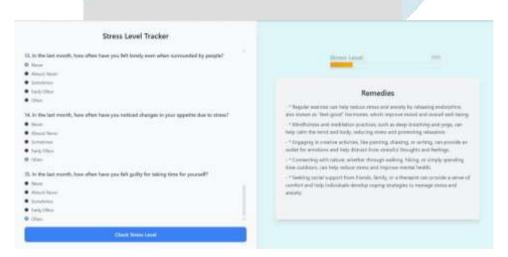


Fig 6: Stress tracker

Figure 6 illustrates the Stress Level Tracker within the Corner platform, a questionnaire-based system built using LLaMA 3.3 Versatile to help users assess and manage their mental well-being. The tracker presents a set of questions related to emotional experiences such as loneliness, appetite changes, and feelings of guilt, with users selecting how frequently they've encountered these issues. Based on the responses, the system calculates a stress level score and visually represents it through a progress bar. Accompanying the score, the platform provides tailored remedies that include activities like regular exercise, mindfulness practices, creative expression, nature engagement, and seeking social support. These suggestions are grounded in psychological best practices, aiming to empower users with practical strategies for stress relief and emotional resilience.

VI. RESULTS

To evaluate the effectiveness of Corner's mental wellness content generation system, a survey was conducted focusing on content authenticity, relevance, clarity, therapeutic alignment, and overall usability. The questions assessed how culturally sensitive and appropriate the generated wellness prompts were, their alignment with mental health goals, and whether the instructions were clear and accessible to beginners.

- How authentic does this wellness prompt feel to you?
- Do you think this prompt aligns with its intended wellness theme?
- Are the techniques and strategies recommended accurate for this theme?
- How easy is it to understand and follow the instructions provided?
- Is the suggested method suitable for addressing the emotional or psychological concern?
- Can someone with no prior experience in mental wellness practices effectively use this content?

The results were as follows:

1. How authentic does this wellness prompt feel to you?

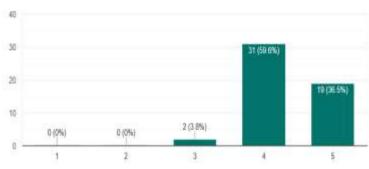


Fig. 6

The prompt was widely perceived as authentic, with 96.1% of users awarding it a 4 or 5-star rating. There was negligible perception of inauthenticity, indicating that the content resonated well with user expectations. Only minimal refinements were suggested, pointing to an overall strong cultural and emotional alignment.

2. Do you think this prompt aligns with its intended wellness theme?

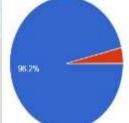


Fig. 7

With an average rating of 4.33 and 96.1% of responses in the 4 or 5-star range, the majority of users confirmed that the content appropriately represented its intended theme—be it mindfulness, emotional support, or stress management. The results reinforce the accuracy and therapeutic validity of Corner's AI-driven content generation using LLaMA 3.3 Versatile.

3. Are the techniques and strategies recommended accurate for this theme?

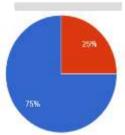


Fig. 8

75% of users found the strategies well-matched to the intended mental health theme, while 25% saw scope for slight enhancements. There were no negative ratings, indicating general satisfaction with the mental health tools suggested. The findings affirm that Corner's therapeutic content is mostly sound, accurate, and contextually appropriate.

- 4. How easy is it to understand and follow the instructions?
 Users gave an average score of 4.23, with 92.3% rating the clarity as excellent or very good. Only 7.7% mentioned minor confusion in understanding specific instructions. This feedback supports that Corner's content is structured and easy to follow, with minimal need for simplification or clarification
- 5. Is the suggested method suitable for addressing the emotional or psychological concerns?

 88.5% of respondents agreed that the suggested coping methods e.g., breathing exercises, thought reframing were appropriate.

 However, 11.5% felt some approaches could be optimized further. This points to a generally effective methodology with opportunities to improve personalization and depth in certain cases.
- 6. Can someone with no prior experience in mental wellness practices effectively use this content

80.8% felt the content was beginner-friendly, while 19.2% noted that some practices might require guidance or prior familiarity. Suggestions for improvement included simplified language, step-by-step guidance, or supplemental visuals to support new users.

VII. CONCLUSION

Corner: Mental Health Platform is an AI-driven solution designed to support students facing academic, social, and personal challenges through an AI-powered chatbot, a stress tracker, and a depression tracker. Unlike traditional wellness apps, Corner provides personalized, interactive support using LLaMA 3.3-7TB-Versatile to deliver empathetic responses and actionable mental health insights. By addressing limitations such as lack of real-time therapy and limited personalization, the platform fosters self-awareness and resilience. Future enhancements, including advanced emotion recognition, AI-generated interventions, and optional live therapy, could further elevate its impact. As an innovative mental health companion, Corner aims to revolutionize student well-being through accessible and adaptive support.

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