# COMPANION CONNECT: AN AI-ENHANCED DIGITAL PLATFORM FOR REDUCING STUDENT LONELINESS AND PROMOTING MENTAL WELL-BEING IN HIGHER EDUCATION

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***ABSTRACT***

*Companion Connect, an innovative digital application designed to mitigate student loneliness and promote positive mental health outcomes through a blend of AI-powered companionship and human volunteer support. Recognizing loneliness as a rising issue in higher education impacting student well-being, the app aims to address limitations of traditional support systems by offering accessible, on-demand resources. Companion Connect, powered by OpenAI's ChatGPT, is specialized for mental health tasks, featuring customizable AI personality and name, mood detection capabilities, and weekly social challenges to encourage engagement in therapeutic activities. It also includes an MBTI quiz to further tailor AI responses to the user's personality. A survey conducted with 15 participants across various demographics evaluated the app's effectiveness. Results indicate a notable improvement in overall average mood scores, rising from 2.27 before app use to 4.73 after. Furthermore, 14 of 15 respondents reported that the app improved their mental state, with common alleviated symptoms including loneliness, anxiety, and lack of motivation. The app also demonstrated a high recommendation rate, with 14 out of 15 participants willing to recommend it to others. These findings suggest Companion Connect is a promising tool for fostering emotional balance and well-being among students.*

***KEYWORDS***

*AI, Language Model, Website, Mental Health*

## 1. INTRODUCTION

Loneliness among students is a rising issue in higher education, impacting academic performance, mental well-being, and overall student success. Loneliness can stem from various factors like transitioning to a new environment, academic pressure, social isolation, and cultural adjustments [5]. Traditional support systems often face limitations in scalability, accessibility, and cultural responsiveness, leaving a substantial gap in comprehensive student support. Digital interventions, such as mental health applications, have emerged as promising avenues to address these challenges by offering accessible and on-demand resources.

This paper introduces Companion Connect, an innovative digital application designed to mitigate student loneliness by providing a unique blend of AI-powered companionship and human volunteer support. Companion Connect's mission is to foster a supportive environment where

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students can engage in self-reflection, leading to personal growth, emotional balance, and a more mindful approach to life's complexities [14]. By integrating an AI companion that is fluent in 50+ languages, Companion Connect aims to offer a holistic and adaptable solution to the multifaceted issue of student loneliness, promoting well-being and resilience within the student population. This proposal outlines a research methodology to evaluate the effectiveness and user experience of Companion Connect in addressing student loneliness and promoting positive mental health outcomes.

## 2. CHALLENGES

In order to build the project, a few challenges have been identified as follows.

### 2.1. Prompt Optimization

Fine-tuning the system and user prompts to reliably elicit empathetic responses without overconstraining the model is challenging. Excessively rigid prompts can make the chatbot feel scripted, while overly loose prompts may yield off-topic or unhelpful replies.

To address this problem, the prompt was modified to define clear, modular system messages for common therapeutic intents. By defining the chatbot as a supportive companion and integrating different roles based on the user-defined chatbot personality, the chatbot produces empathetic and realistic responses.

### 2.2. Mood Tracking

Accurately inferring user mood is critical, but natural language signals can be subtle or ambiguous. If the user’s feelings are misread, the chatbot can respond inappropriately and reduce trust.

For this experiment, a two-part solution was used:
LLMs are capable of sentiment analysis, so the model will respond based on the user’s inferred mood.

Trigger words, such as “sad” or “happy”, are used to identify the mood of the user.

### 2.3. Personalization

To build long-term rapport, the chatbot must reflect individual user preferences, background, and communication style. However, designing a system that supports multidimensional customization without overwhelming users is complex; thus, user configuration needs to be straightforward.

Custom personalization features include:

User mood
User MBTI
Username, age, pronouns, interests, goals
AI personality
Familiarity level

These personalization layers ensure each interaction aligns with individual preferences and emotional needs.

## 3. SOLUTION

Companion Connect is a chatbot powered by OpenAI's ChatGPT and specialized to focus on mental health tasks [9]. The name and personality of the chatbot can be changed to add more expressiveness to the chat. The mood of the user can also be detected through two methods: by manually looking for trigger words in the messages sent, such as "sad", or "happy", and feeding that into the language model as context, or by having the language model respond in a way corresponding to the user's inferred mood, since language models are capable of sentiment analysis on their own. The language model has a system prompt that determines how it should respond. The AI's personality can be modified in the app settings. Specifically, the AI companion can adopt personalities such as "Supportive", "Energetic", or "Wise". Each personality type is defined through tailored system prompts that shape the tone, style, and content of responses. For example, a "Supportive" personality emphasizes empathy and reassurance. Since the app is built on top of web technology, the chatbot's response is parsed from JSON for the currently running instance of the app and stored in localStorage. The app also features a weekly social challenges page to motivate the user to engage in new recreational activities or actions. Each challenge is presented with clear instructions, practical suggestions, and optional community sharing features that make the activity easier to try. For example, a challenge might encourage a user to attend a campus club meeting, invite a peer for coffee, or practice a short mindfulness walk. Users are allowed to cycle between social challenges at any point in time. Lastly, there is an MBTI quiz in the app preferences where the user can determine their MBTI personality type [6]. This information goes into the app context for the chatbot to influence the nature of responses.

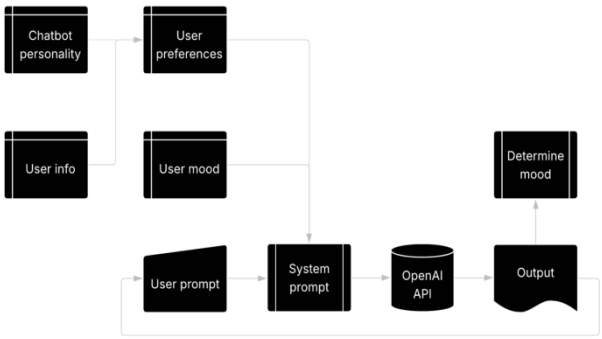


Figure 1. App Wireframe

Chat Page

The Companion chatbot system is designed to support conversations with individuals experiencing mental health challenges. The interface resembles a typical chat application, allowing users to input text and receive natural language responses from a large language model (LLM) [10]. Figure 2 illustrates the real-time interaction flow within the Companion chatbot system. The user begins by entering a message into the chat box (e.g., "What are your recommendations?"). This input is then transmitted to the large language model (LLM) through the app's backend. Once the model begins generating a reply, the interface displays a temporary "Companion is thinking…" animation to signal to the user that the system is actively processing the request. When the response is complete, the model's output (e.g., suggestions for self-care activities) is rendered back into the chat window as a text message. The interface visually separates the user input (shown in a distinct color bubble) from the model response, maintaining the look and feel of a familiar messaging application. This design choice helps normalize the interaction, ensuring that users feel they are engaged in a conversational flow rather than

receiving static information. The system can also handle direct queries, such as questions about wellness or self-care activities. In Figure 1, for instance, the model suggests contacting trusted individuals, another important aspect of overall health, while encouraging self-care and self-recognition. While the model is generating a response, the interface displays a simple animation ("Companion is thinking...") to indicate to the user that the system is processing the input and making API requests.

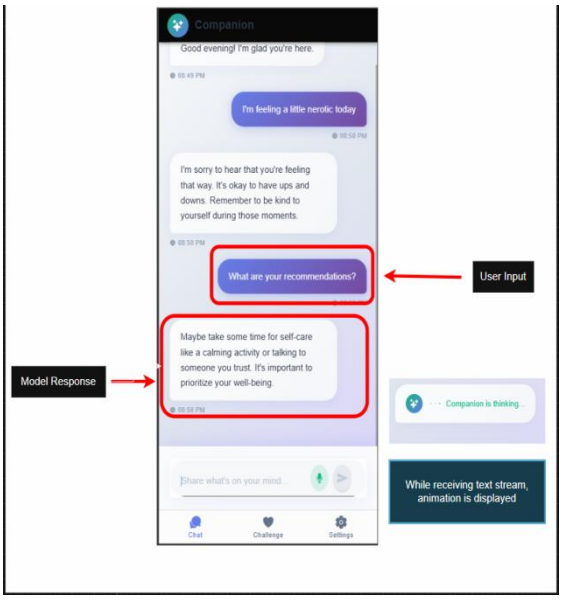


Figure 2. Main chat UI

```
const typeMessage = async (message: string, messageType: string) => {
  const words = message.split(" ");
  let typedMessage = "";

  for (let i = 0; i < words.length; i++) {
    typedMessage += (i > 0 ? " " : "") + words[i];

    setMessages((prev) => {
      const updated = [...prev];
      const lastMessage = updated[updated.length - 1];

      if (
        !lastMessage?.isFromUser &&
        lastMessage?.content.startsWith(typedMessage.split(" ")[0])
      ) {
        updated[updated.length - 1] = {
          ...lastMessage,
          content: typedMessage,
          messageType,
        };
      } else {
        updated.push({
          id: Date.now().toString(),
          content: typedMessage,
          isFromUser: false,
          timestamp: new Date(),
          messageType,
        });
      }

      return updated;
    });

    await new Promise((resolve) =>
      setTimeout(resolve, appSettings.typingSpeed)
    );
  }
```

Figure 3. Description of chat pseudo-animation code

```
// Storage functions
const loadAppSettings = async () => {
  try {
    const { value } = await Preferences.get({ key: "chat_settings" });
    if (value) {
      const savedSettings = JSON.parse(value);
      setAppSettings({ ...defaultAppSettings, ...savedSettings });
    }
  } catch (error) {
    console.error("Error loading settings:", error);
  }
};

const loadUserProfile = async () => {
  try {
    const { value } = await Preferences.get({ key: "user_profile" });
    if (value) {
      const profile = JSON.parse(value);
      setUserProfile({ ...defaultUserProfile, ...profile });
    }
  } catch (error) {
    console.error("Error loading user profile:", error);
  }
};
```

Figure 4. Description of state management code

Figure 3 shows the code for simulating a chat animation that resembles a human typing. The code processes each character in the text at regular intervals and updates the message sent by the bot for a reactive user interface update. Figure 4 explains the code used to save app state in user preferences. To ensure the main chat page reflects updated preferences, Ionic'suseIonViewWillEnter calls the loadAppSettings and loadUserProfile functions to trigger a state update so that the rest of the app can use the new settings.

The Companion application also includes a structured "Challenge" feature for behavioral activation and social connection. As shown in Figure 5, each user receives a Weekly Social Challenge that encourages participation in activities that help with mental distress. Each challenge includes a title, a short description, and a difficulty level. For example, the challenge titled "Volunteer Together" asks users to find and participate in volunteer activities with others [15]. The difficulty is marked as hard, indicating the effort or social energy required.

There are mainly two actions for users: Mark Complete, which lets users show they have finished a task and builds a sense of achievement, and New Challenge, which updates their current task. This supports goal setting and progress tracking, which are especially important in therapy, particularly in cognitive behavioral therapy (CBT) [11]. All these features are part of the app's lower proactive navigation, so users can still chat and access their settings. Notifications can be turned on to remind users about challenges.


Figure 5. Social tasks meant to encourage socialization

The Companion application includes a settings screen that enables users to tailor the experience to their preferences and personality. As shown in Figure 3, the settings page offers several configuration options. At the top, users can view or update their profile status, which shapes how the AI addresses them. Below this, expandable sections provide access to features such as an Advanced MBTI Quiz. Results from this quiz can be applied to adjust the AI's conversational style, aligning responses with the user's personality traits (e.g., emphasizing empathy, structure, or enthusiasm). Additional toggles allow users to select preferred AI personalities, manage notification preferences, and adjust language options. By making these adjustments, users can actively shape the tone, pace, and level of personalization of their interactions with the AI, ensuring that the application aligns closely with their needs and communication style.

There is also an AI Personality section where users can set the chatbot's tone or demeanor - which is called Supportive in this case - as well as customize the assistant's name (which defaults to Companion) [12]. Below this is a Preferences panel with toggles for interface features, such as emojis, typing animations, voice input, and notification controls. This level of configuration allows for accessibility and user comfort and reinforces the chatbot's use as a customized personal mental health companion. The design enables easier navigation with consistent tabs available for Chat, Challenge, and Settings.

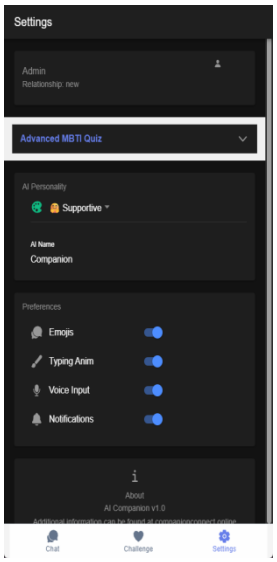


Figure 6. App Settings

## 4. EXPERIMENT

To determine the effectiveness of the app on mental health within different demographics, we conducted a survey asking a random assortment of participants for various information and analyzed the results. The study group consisted of 15 individuals across various age groups and gender identities. We asked the participants the following set of questions:

-Gender
-Age range
-Whether the app improved the mental state or not
-Symptoms that were alleviated
-Mood before using the app
-Mood after using the app
-Whether they would recommend the app to others.

The data was then linked to a spreadsheet, and a quantitative analysis was done.
Comparing mood scores before and after using Companion Connect

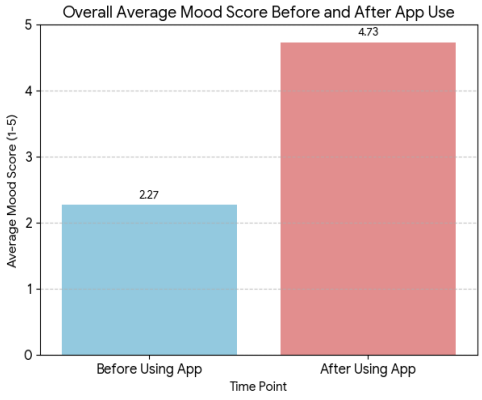


Figure 7. Comparison of mood scores before and after app usage

The average mood scores before and after using the app on a 1 to 5 scale were 2.27 and 4.73, respectively.

| | *mood before* | *mood after* |
|---|---|---|
| *count* | 15 | 15 |
| *mean* | 2.27 | 4.73 |
| *standard deviation* | 1.10 | 0.59 |
| *min* | 1 | 3 |
| *max* | 5 | 5 |

Figure 8. Table of experiment

The spread of the data shows that participants had varying levels of mental health before using the app, but after usage of the app, most responses were about the same.

Breaking down the feelings most experienced by users

Of the 15 users surveyed, most reported feeling loneliness. The second most frequent emotion was anxiety, and the third was lack of motivation.

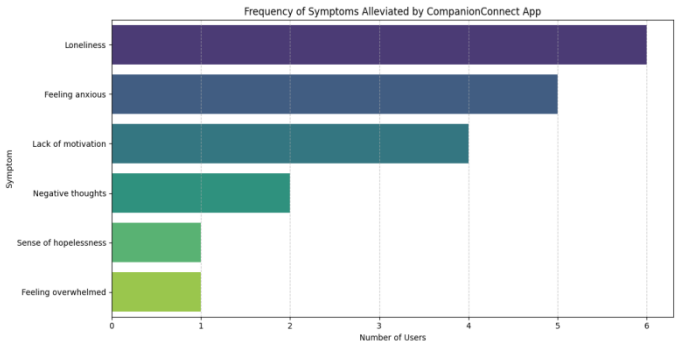


Figure 9. Symptom frequency across all users

Of the 14 participants who responded to the question about whether the app improved their mental health or not, all responded with ‘Yes’, except 1 participant who left the question blank.

## 5. Related Work

Large Language Models as Mental Health Resources: Patterns of Use in the United States: This study surveyed nearly 500 U.S. residents in 2025 who had mental health conditions and used LLMs [2]. It was found that almost half of them had used LLMs for mental health support. The main reasons were accessibility and affordability. People used LLMs for issues like anxiety and depression, and surprisingly, even during crises like suicidal thoughts. Most users felt LLMs improved their well-being. The study showed that many people are already using AI for mental health, highlighting its widespread, informal adoption.

AI Chatbots for Mental Health: Values and Harms from Lived Experiences of Depression: This research interviewed 17 people with depression about their experiences with an AI chatbot (Zenny, based on GPT-4o) [1]. It identified what users valued most: getting information,

emotional support, personalized responses, privacy, and crisis help. However, for each value, the study also found potential harm. For example, while personalization was liked, it raised big privacy concerns. Users also noted that AI lacks true empathy. The study aimed to show developers how to design safer and more helpful mental health chatbots by understanding these trade-offs.

The Applications of Large Language Models in Mental Health: Scoping Review: This review looked at many academic papers to map out how LLMs are being used in mental health research [3]. It found that LLMs are most commonly used for "screening and detection" of mental disorders like depression and anxiety, often by analyzing text from social media or interviews. LLMs are also being explored for supporting clinical treatments and providing counseling or education. The review showed the wide range of applications for different LLMs, from general models like GPT-4 to specialized ones, and the various data sources they use.

## 6. CONCLUSIONS

One thing that could improve the effectiveness of the app is fine-tuning the language models using logs of conversations as an opt-in feature. Companion Connect utilizes the ChatGPT API to generate messages in a chat manner; however, models like Gemini, Claude, etc, could be more effective at handling certain topics [13]. Lastly, more data could be collected to evaluate more accurately what users are expecting from the app or what they feel would be beneficial to their problems. Based on the findings of this research and related works, people are likely to benefit from the use of chatbot apps as a coping mechanism for loneliness and anxiety. According to this paper, ChatGPT may be a useful tool in counteracting social isolation; however, more diverse research is needed to establish proper causal relationships [4].

## REFERENCES

[1] Yoo, Dong Whi, et al. "AI Chatbots for Mental Health: Values and Harms from Lived Experiences of Depression." arXiv preprint arXiv:2504.18932 (2025).

[2] Rousmaniere, Tony, et al. "Large language models as mental health resources: Patterns of use in the united states." 18 Mar. 2025,

[3] Jin, Yu, et al. "The Applications of Large Language Models in Mental Health: Scoping Review." Journal of Medical Internet Research 27 (2025): e69284.

[4] Alzyoudi, M., and K. Al Mazroui. "ChatGPT as a coping mechanism for social isolation: An analysis of user experiences and perceptions of social support." Online Journal of Communication and Media Technologies 14.3 (2024): e202433.

[5] Ousman, Youssouf Issen, and Thseen Nazir. "Loneliness among University students as a growing concerne." Journal of Family Counseling and Education 8.2 (2023): 85-99.

[6] Ramachandran, Vignesh, et al. "Myers-briggs Type indicator in medical Education: a narrative review and analysis." Health Professions Education 6.1 (2020): 31-46.

[7] Roumeliotis, Konstantinos I., and Nikolaos D. Tselikas. "Chatgpt and open-ai models: A preliminary review." Future Internet 15.6 (2023): 192.

[8] Baron-Cohen, Simon, et al. "Recognition of mental state terms." British Journal of Psychiatry 165.5 (1994): 640-649.

[9] Adamopoulou, Eleni, and Lefteris Moussiades. "An overview of chatbot technology." IFIP international conference on artificial intelligence applications and innovations. Cham: Springer International Publishing, 2020.

[10] Naveed, Humza, et al. "A comprehensive overview of large language models." ACM Transactions on Intelligent Systems and Technology 16.5 (2025): 1-72.

[11] Hofmann, Stefan G., et al. "The efficacy of cognitive behavioral therapy: A review of meta-analyses." Cognitive therapy and research 36.5 (2012): 427-440.

[12] Singh, Simarpreet, and Williamjeet Singh. "AI-based personality prediction for human well-being from text data: a systematic review." Multimedia Tools and Applications 83.15 (2024): 46325-46368.

[13] Paredes, Cristian Mauricio Gallardo, Cristian Machuca, and Yadira Maricela Semblantes Claudio. "ChatGPT API: Brief overview and integration in Software Development." International Journal of Engineering Insights 1.1 (2023): 25-29.

[14] Leithwood, Kenneth, Doris Jantzi, and Rosanne Steinbach. "Maintaining emotional balance." Educational Horizons 79.2 (2001): 73-82.

[15] Cnaan, Ram A., Femida Handy, and Margaret Wadsworth. "Defining who is a volunteer: Conceptual and empirical considerations." Nonprofit and voluntary sector quarterly 25.3 (1996): 364-383.