

CUCU: Your Wingman for Mental Well-being!

The Cooper Union



09/13/2024

O1 Our Team

Introduction to our team of mechanical and electrical engineers

O2 Background Research

Statistics about NYC mental health + DOE.

O3 Target Audience

NYC DOE Student Wellness Team, Highschool students.

O4 Design Process

Initial Brainstorm, algorithms, and UI design.

O5 Solution & MVP

Analysis of app's features for both students and administrative members.

O6 Mood Classification Algorithm

NLP-based chat-bot, and mood sorting algorithm.

O7 Commercial Viability

Why should the DOE invest in our project?

O8 Future Work

3 year time-line for next steps of development process.

01

Our Team

Our Team



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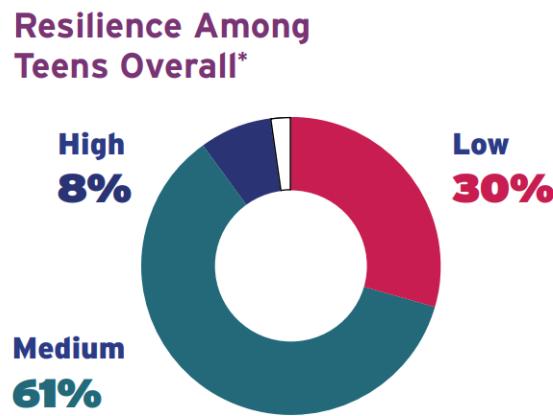
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Background Research

**"In 2021, 38% of the city's high
school students reported feeling so
sad or hopeless in the past year,
compared with 27% in 2011. "**

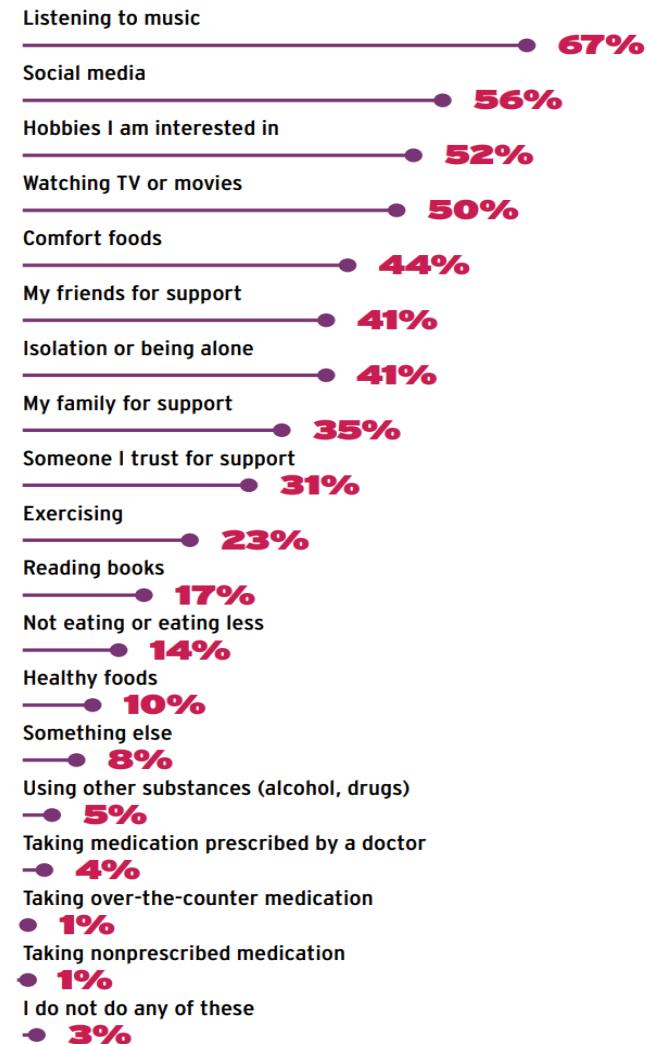
The State of Mental Health in NYC schools

- Between 2011 and 2021, the city's high school students reporting feeling sad or hopeless increased from 27% to 38%
- While majority of teens use music and social media as coping mechanisms, 23% of teens reported criticizing themselves a lot and 15% say they blame themselves for a lot of things.



We identify resilience to be a critical measure for the student's ability to bounce back after experiencing stressors or challenges and acknowledge how students may be ill-equipped with negative coping mechanisms. The teenage years can increase exposure to new and unique stressors as students approach high school.

Coping Mechanisms Teens Report Using



Mental Health in NYCDOE Schools

DOE Mental Health Programs: School counselors, DESSA Screener, Harmony SEL, etc.

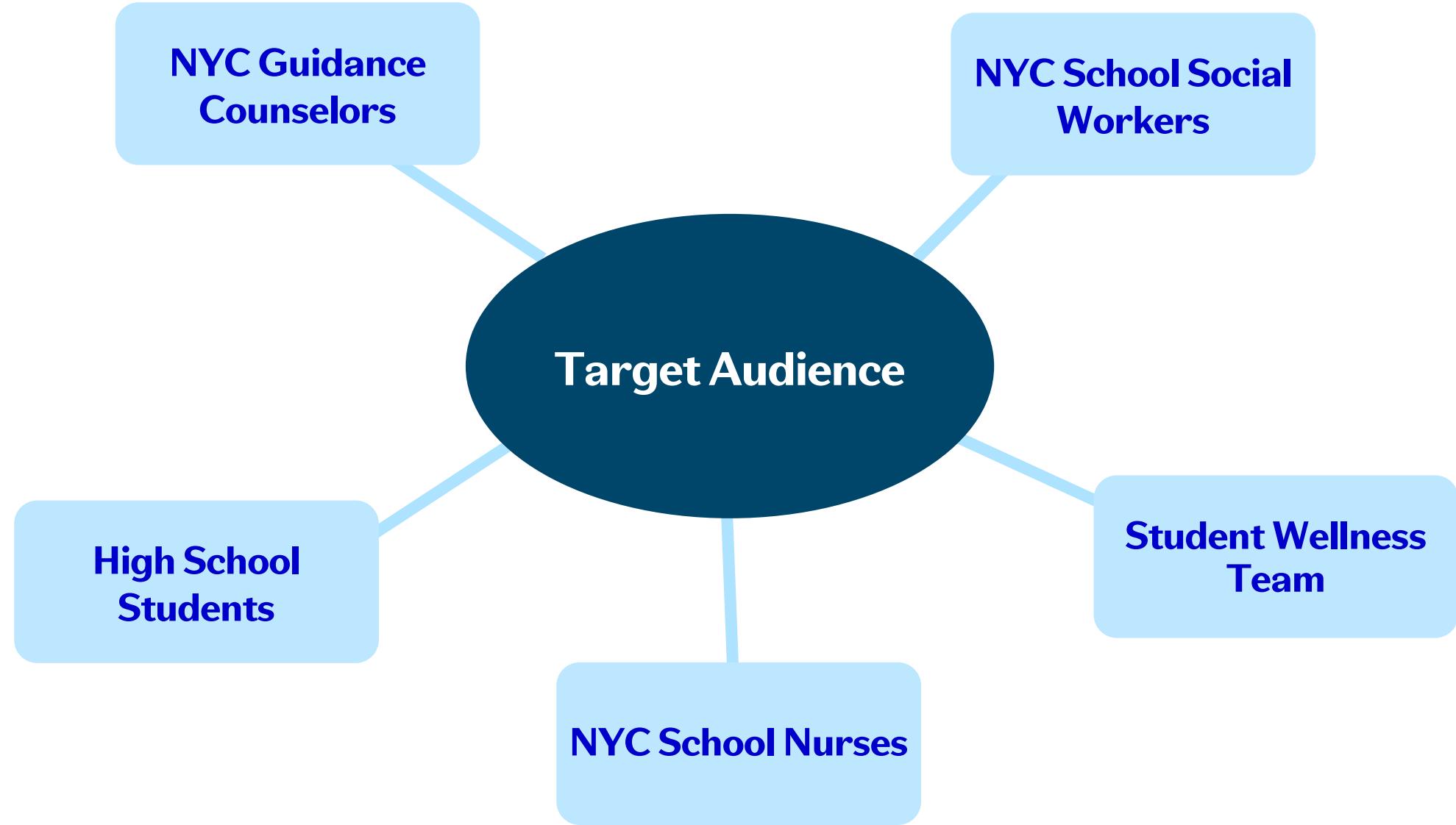
"While DOE has shown willingness to confront these issues, many of NY's school children still face a mental health emergency, and schools are not equipped to provide them with support they need." - Comptroller DiNapoli

"Only 1,101 out of 1,524 public schools had at least one social worker; of those schools, 80% did not meet the recommended social-worker-to-student ratio of 1:250. 423 public schools did not have a social worker at all."

-Data collected by DiNapoli's health and safety for schools audit (2022)

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Target Audience



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Design Process

Design Process

01 Brainstorm

- Desired features.
- Algorithms implemented.
- Design UI.
- NYC-based app.

02 Research

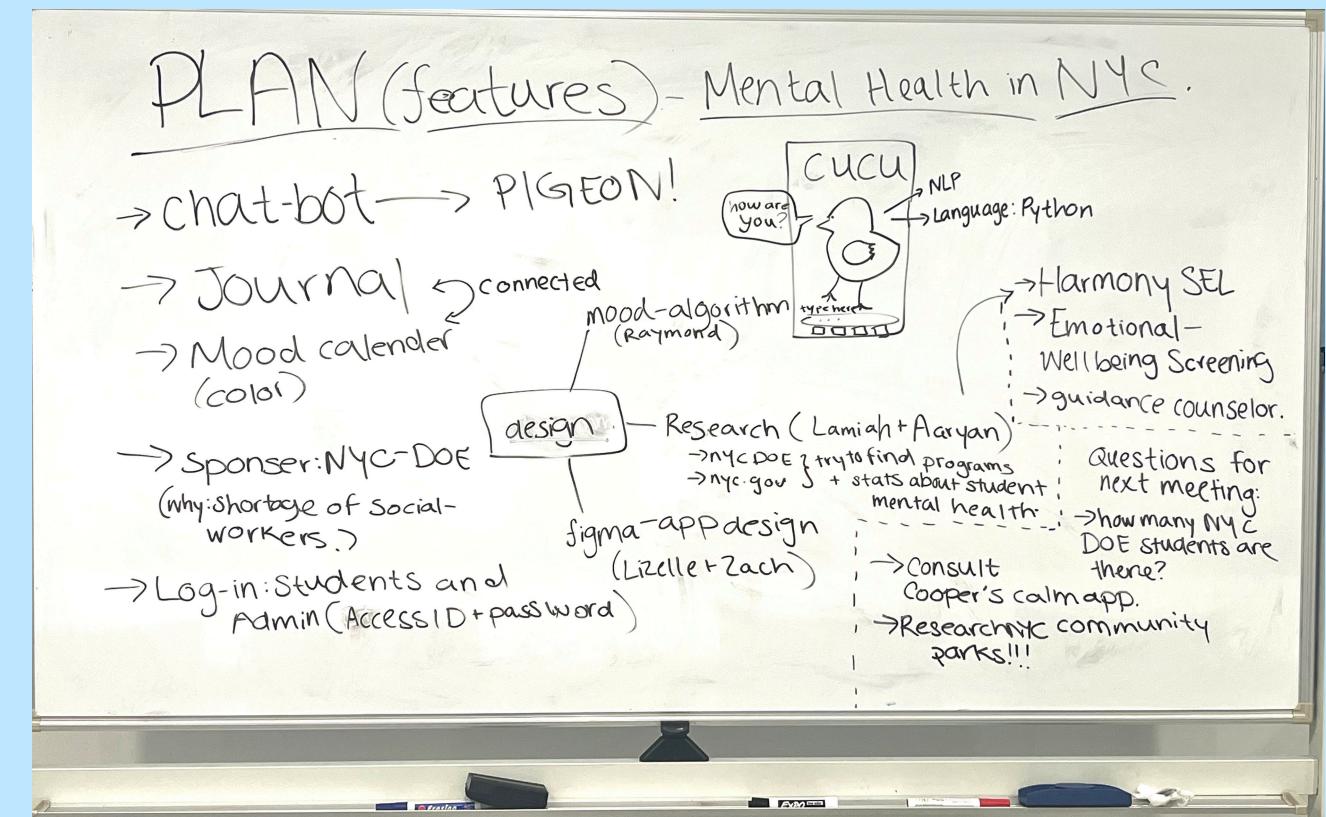
- Investigated nyc.gov sites.
- Department of Education programs.
- Chat-bot features.
- Current mental health apps.

03 Figma

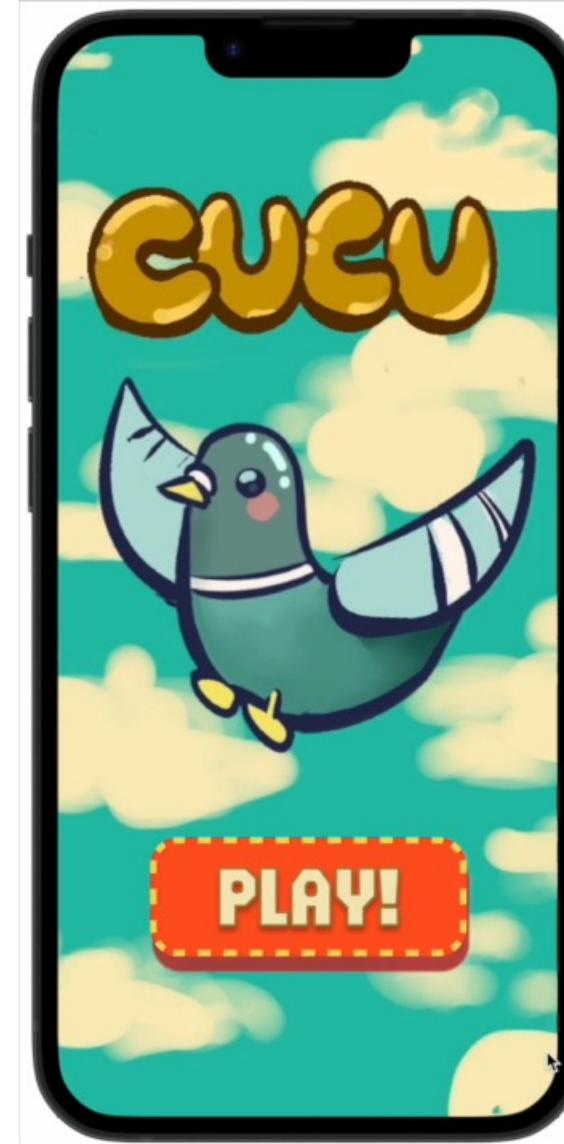
- Utilized for mapping app features.
- Designed virtual companion (CUCU).
- (anything else to add)

04 Python

- Created mood-based algorithm.
- Incorporated data from (idk what ray did)



Overview of Solution

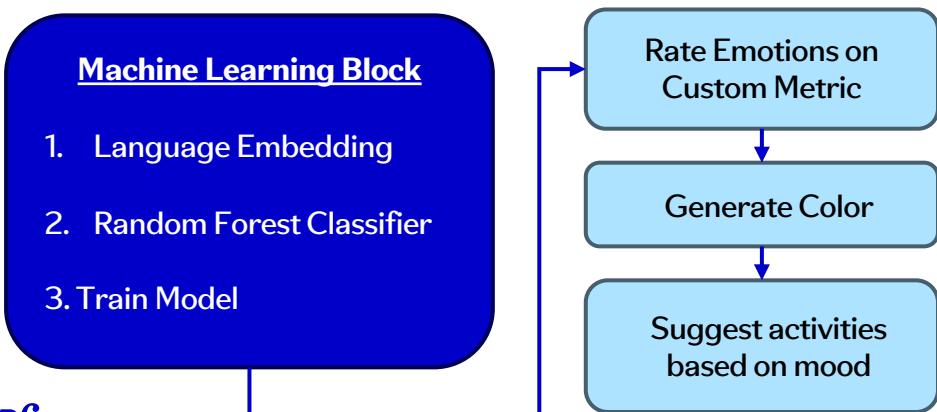


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Mood Classification Algorithm

Mood Classifier

- The classifier analyzes the text of journal entries using NLP techniques, identifying keywords, phrases, and emotional cues associated with different moods (e.g., "happy," "anxious," "angry").
- Each mood is associated with its own color to be used in the CUCU mood journal.
- The classifier then suggests mental health activities based on their mood and needs.



Analysis History

Today was a surprisingly calm day. I woke up earlier than usual and spent some quiet time reading before the hustle of the day began. It felt refreshing to start my morning without the usual rush. Work was manageable—no major deadlines, just a few meetings and emails to get through. I even had time to take a walk during lunch, which helped clear my mind. By the evening, I felt a sense of accomplishment, and I ended the day with a peaceful dinner at home. It's rare to have such a calm and balanced day, but it's something I definitely needed.

Analyze

Results:

Emotions:

- satisfied: 28.57%
- calm: 27.65%
- happy: 22.12%
- proud: 12.90%
- excited: 3.23%
- frustrated: 1.84%
- anxious: 0.92%
- bored: 0.92%
- surprised: 0.92%
- afraid: 0.46%
- angry: 0.46%

Color:



Emotional Balance Score:

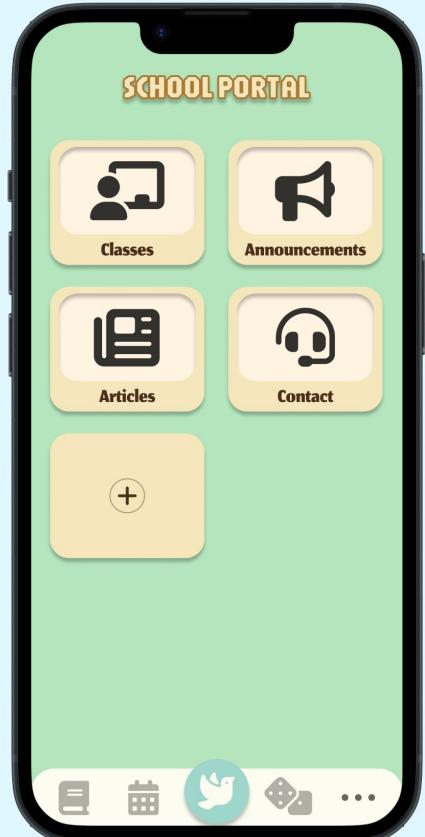
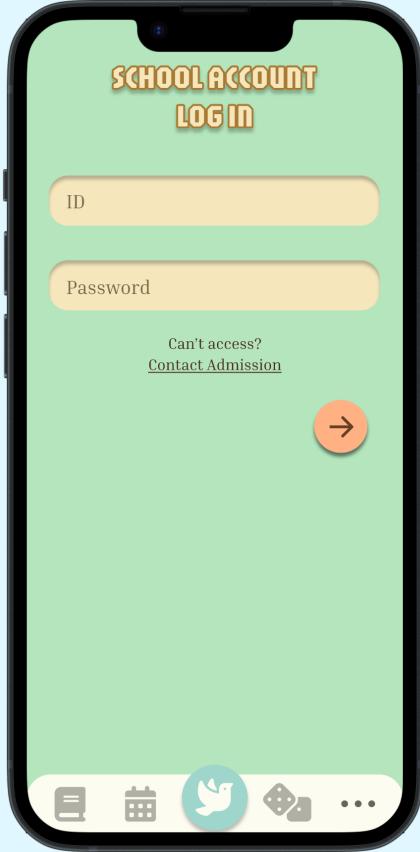
96.45

Suggested Activities:

- Engage in a peaceful hobby like gardening
- Continue your current relaxation practices
- Try a new form of meditation

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Minimum Viable Product (MVP)



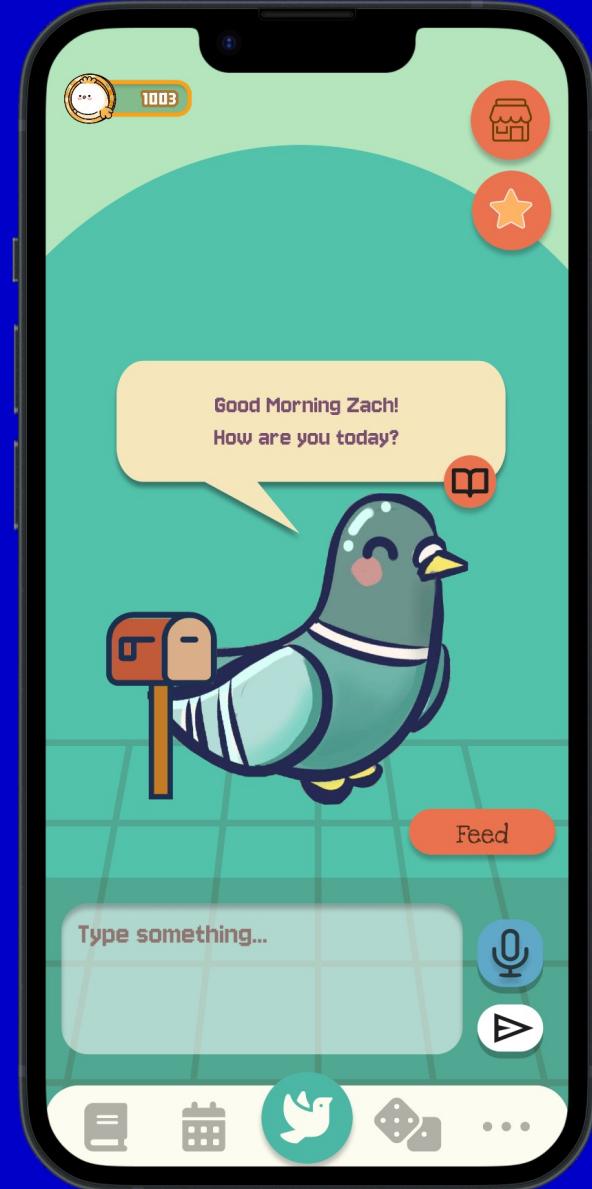
Log-in Page

- Student and Admin register or sign-in using their student/access id, followed by their password.
- Corresponding credentials transports users to their respective home pages (Student page and Admin Page)

Virtual Companion

Functions

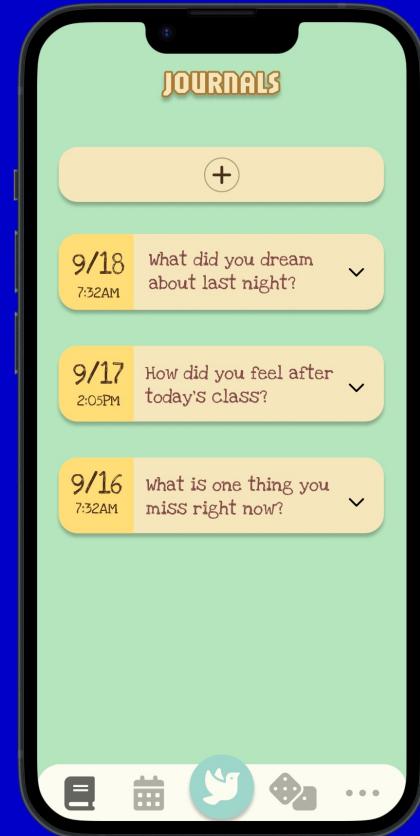
- Virtual Companion Default's Name: Cucu
- Cucu will ask students questions about their day. Students may reply in both text and audio mode.
- Cucu will change its tone and suggest mini-games based on student's interaction.
- Student can view conversation history with Cucu.



Journal

Functions

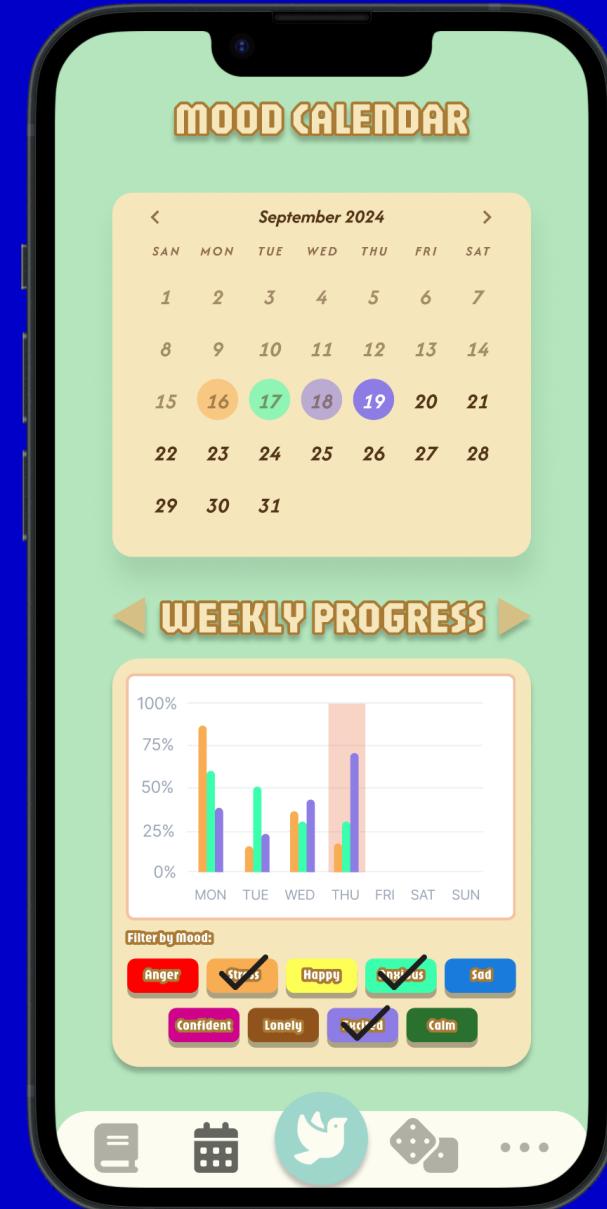
- Journaling feature randomly assigns students with prompts. Student may shuffle through prompts given to them.
- The mood classification algorithm calculates top moods associated with each journal entry.
- Past journal entries are saved for the student to reflect on later.
- Journal entries will not be shared with Admin accounts.



Mood Calendar

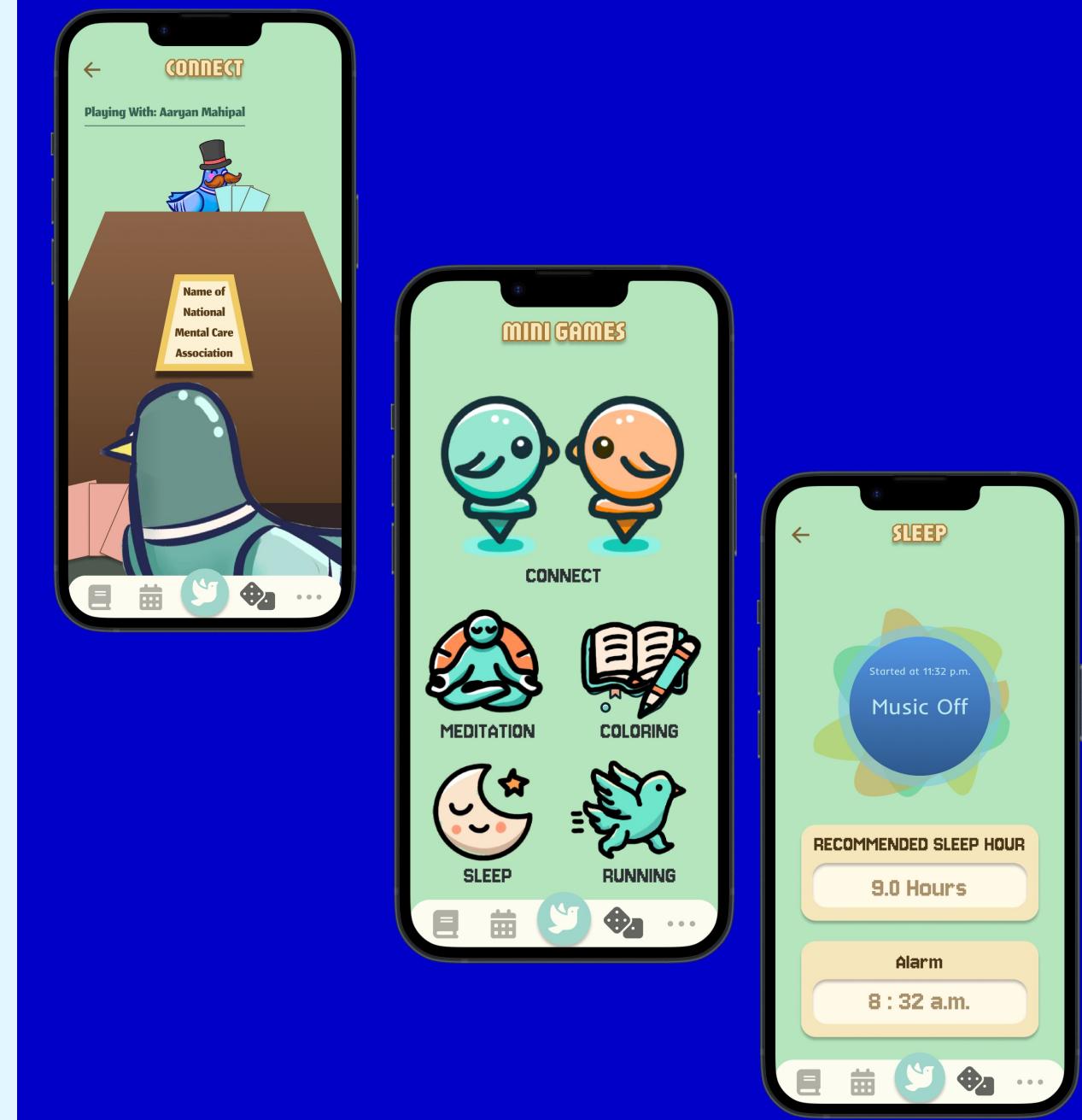
Functions

- Mood calendar displays the highest correlated moods for each day.
- Displays daily and weekly progression of student's moods and can be filtered based on moods specified.



Mini-Games

- **Connect:** Multiplayer games: student can race their pigeons, play slap—"jack" with words of affirmation, mental health trivia, etc.
- **Meditation:** Breathing exercises, visualization, yoga, with reminder to hydrate.
- **Sleep:** Sleep sounds/alarm, with reminders to get 8 hours of sleep.
- **Running:** Stretching/Exercise videos with CUCU, and suggests locations in NYC to hike, swim, and community parks.
- **Coloring:** Relaxing coloring book with numbers, pictures of NYC, etc.



Achievements & CUCU Store

Functions

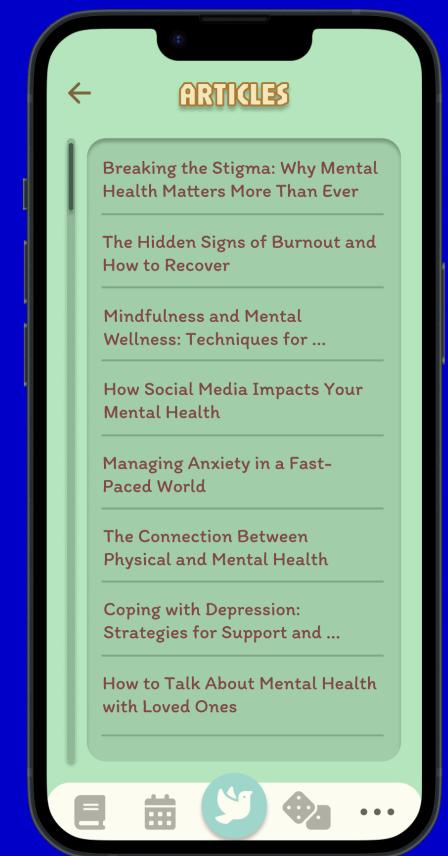
- Examples of Achievements:
 - Spending 20 CuCoins on clothing.
 - Writing in your journal three times.
 - Visiting NYC locations suggested by Cucu.
- Students can utilize achievements to collect CuCoins or clothing for Cucu.
- Students can see the number of days they have played with Cucu in a row. If they talked with Cucu for seven days in a row, they receive a gift for their pigeon companion!



Contact + Articles

Functions

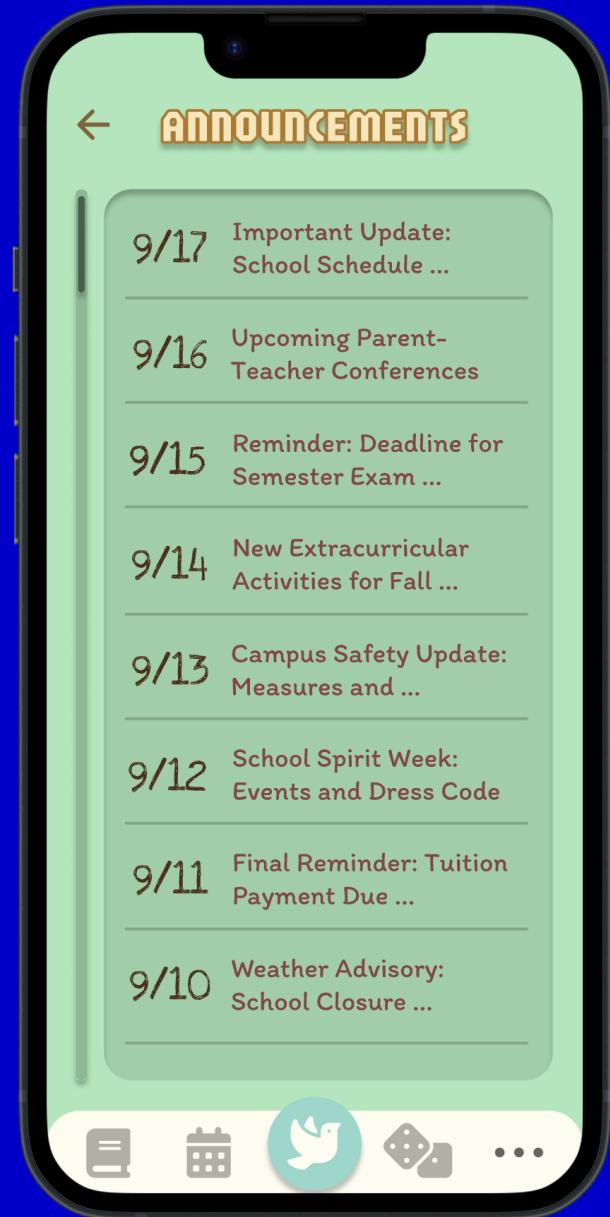
- Through contact, students can:
 - Message their school's Wellness Support team through the app's chat feature.
 - Directly contact the school.
 - Find nearby areas to seek necessary help.
- Students can access articles regarding mental health activities.



Admin: Announcements

Functions

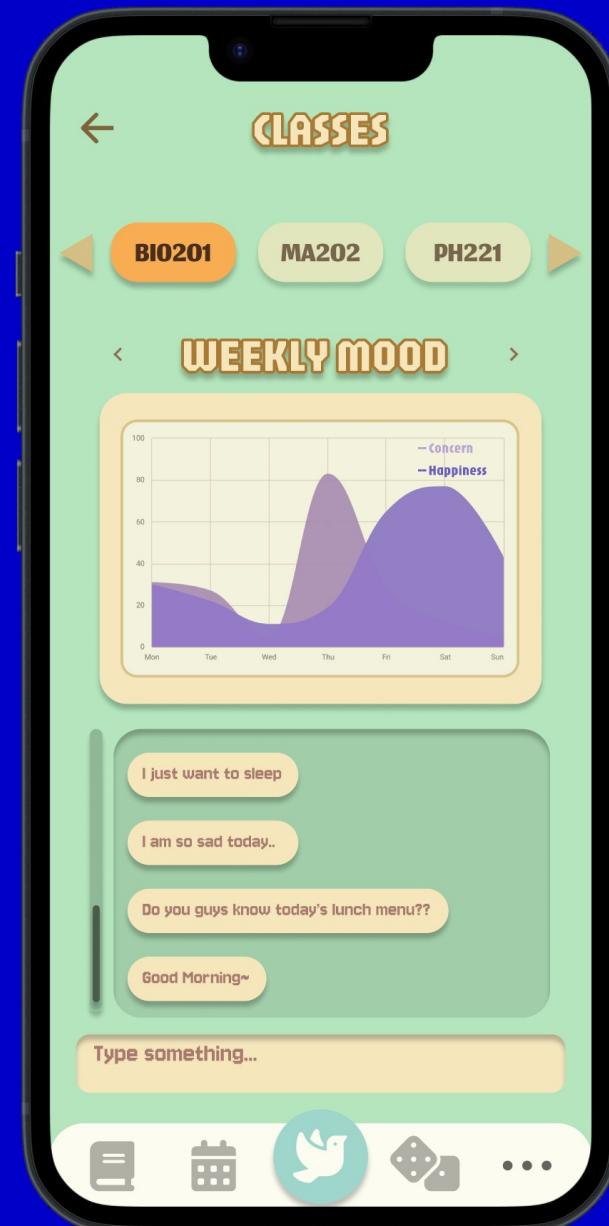
- If the user is a Wellness Support member, they can send announcements to the team and students.
- CUCU will send notification on device. If user is on app's home page, message will appear on screen.
- When message is exited out, announcement will be recorded in the "mailbox."
- User can view past announcements in their history.



Class Divider

Functions

- Admin can view student's moods, with data organized by each class.
- Each student's mood is sorted from "most concerning" to "least concerning" via graphical model.
- Each class will have a chat feature with their respective social worker.



07 Commercial Viability

Commercial Viability

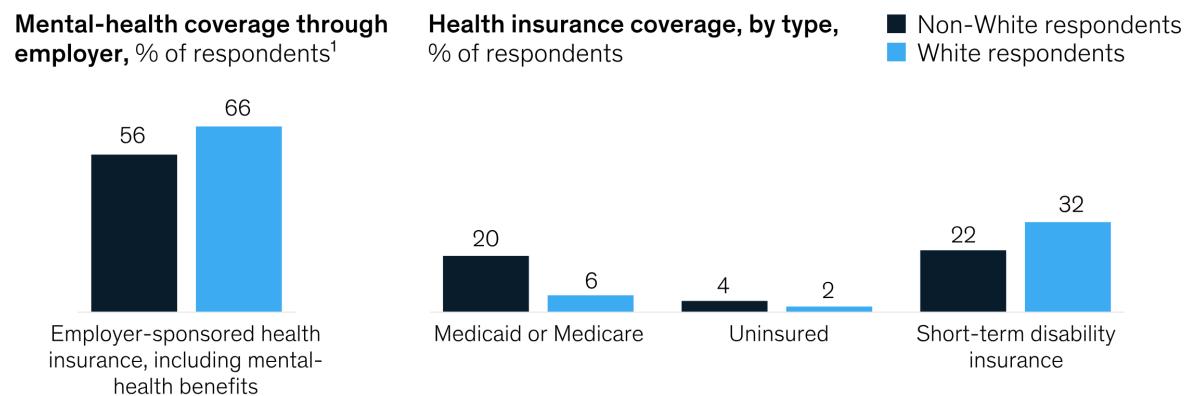
In 2022-2023, there were ~1.05 million students registered in the NYC school system, the largest school district in the United States.

While the number of students in DOE schools have only increased by ~1%, it is a sufficiently large and fragmented market for digital mental health services.

Why should the DOE care about this?

As a state, NY spends more on behavioral health (BH) including both mental health disorders and substance abuse than almost all other US states (\$196 more a year per person than the national average). This is while only 25% of NY residents have a BH-condition while the national average stands at 27%.

Despite NY's above-average spending, it ranks among the bottom-half of all states in some BH metrics, including the proportion of adults, teens, and children with depression who did not receive treatment in 2021.



"Non-White respondents report having lower rates of employer-sponsored health coverage, including mental health benefits"

08

Future Steps

Future Steps

Estimated Timeline ~ 3 years



Works Cited

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Thank You!

