AI-ENHANCED MEDITATION: LEVERAGING PERSONALIZATION AND JOURNALING TO PROMOTE STRESS REDUCTION AND EMOTIONAL WELL-BEING

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ABSTRACT

The benefits of regular meditation can improve the daily lives of a lot of people. These benefits can be seen by the research of Sala and Ratna which includes the promotion of stress reduction and a positive increase in emotional well-being [2][11]. We aim to create a more convenient and beneficial way for people to meditate and keep track of their practices. Our goal is to reach as many people as possible, offering support to ease their stress and lift the weight of the challenges of the world. Some of the key technologies we are using are AI meditation exercises, personality tracking, and journaling. The AI mediation exercises allow for guided exercise in the meditation practice that the user selects. This takes into account the user's religion, personality, location, and time available in order to create a curated exercise. The personality tracker allows users to discover the pros and cons of their own personality as well as retaking a test to see if their personality has changed over time. Lastly, the journal allows users to write down their thoughts for the day as well as save previous exercises to reference in the future. Through the anecdotes and feedback of the users we were able to improve parts of the app and see how effective it was at building consistent meditation practices.

KEYWORDS

Meditation Technology, Emotional Well-Being, AI Personalization, Stress Reduction

1. INTRODUCTION

In 2021, 22.8% of U.S. adults experienced mental illness (57.8 million people), according to the National Alliance on Mental Illness (NAMI). This includes 5.5% experiencing serious mental illness [5]. In 2023, 20.3% of adolescents aged 12-17 had a current, diagnosed mental or behavioral health condition, according to the Maternal and Child Health Bureau (.gov) [6]. While these statistics don't seem outrageous, they depict how 1 out of every 5 teenagers and 1 out of every 5 adults in the U.S. are afflicted with mental illness. Furthermore, this trend portrays an increase in mental illnesses as the years go by [13]. With the increased consumption of the internet and media platforms, teens and young adults are becoming increasingly pressured to attain perfection. This fear of missing out—a term coined by Patrick J. McGinnis—results in people facing the impediment of balancing responsibilities and success [12]. These results raise concerns regarding adolescent and young adult mental health.

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Personally, I am affected by this because during my time in high school, 9th grade, I heard that one of my seniors had committed suicide from academic stress (2022), alongside a senior at our rival school, Andover, having committed suicide earlier this year (2025) for similar reasons. My own mental health plays a factor in this, with my decision to adapt meditation to my routine having been helpful in my journey, but time and environment to perform meditation are inconsistent and sometimes inefficient.

The first methodology by Adam Burke and his co-authors was to sample a portion of the population and ask questions concerning their meditation practices. Our method tries to achieve a similar goal in allowing users to practice meditating. Adam and his co-authors need to gather people in order to sample the population to achieve their goal whereas in ours the users can use the app anytime [1].

The second methodology by Nisha Rao and Kathi Kemper is to use online meditation modules from 3 different websites in order to improve certain aspects of people's lives [9]. This is good in that the end result was a noticeable improvement for those who used it. In contrast to online meditation, our mobile app is more accessible to those without access to a computer and allows for customization of meditation exercises.

The third methodology by John Astin explores physical meditation where the volunteers follow a set program [3]. This method allows for consistent practice of meditation which helps to build a pattern in the individual's life. This is good as regular meditation has shown greater results than sporadic meditation as seen in the research by Catherine [10]. Our app allows for many types of mediation both physical and emotional and also logs the meditation so a user can keep track of how consistent they have been.

Daily meditation routines have been noted as beneficial for mental health [14]. The mobile app 'Kabala' seeks to grant users an easy-to-use environment where they can regulate their own lives and reflect on their own health. This app acts as an outlet for individuals suffering mentally, emotionally, or spiritually by allowing independent self-regulation in the form of journaling and spiritual activities. It is also built with the intention of granting a sense of accomplishment over a prolonged period of time; this sentiment is conveyed through statistics on the profile page, alongside journal entries being saved for an indefinite amount of time. This app features Spirit exercises intended to foster emotional and spiritual well-being, which also ties to a personality screen meant for self-wellness. There is also a religious preference, in case the user is agnostic or an atheist, or has beliefs that do not follow that of convention.

Thomas Hollon's research brings to light the fear students have of their own mental health and how they mask it [15]. I decided to make my app based on this because I wanted users to have control over how the app helps them without the fear of being judged for their mental health. This app allows users to reflect on themselves on their own in their own time, helping users spend time taking care of themselves without having to make drastic changes to their schedule or seek external help.

To test the user experience and functionality of the app, we conducted a survey-based experiment on four preliminary users. With a series of 10 questions rated on a Likert scale of 1-5 (1 being strongly disagree and 5 being strongly agree), we addressed core features and goals of the app. With an overall average rating of 4.3 out of 5, the results confirmed that the users found the app engaging, visually appealing, and intuitive to use. The strongest aspects were the app's clean interface and aesthetically pleasing visuals. The homescreenwas also praised for its welcoming design and visual art. However, lower scores on AI interaction and generation suggest that improvements could be made to enhance AI generated content and allow more self-

customization. In particular, the AI image generation could be improved to better match user expectations.

The AI meditative practices could also allow for users to customize the generated instructions to better fit their goals. Overall, the experiment confirmed that the app fulfills most of its intended purposes and identified clear areas of revision to encourage consistent daily meditation and increase user well-being.

2. CHALLENGES

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

2.1. Journal Screen

The journal screen shows entries that the user has submitted and keeps a history of what the user has submitted for reference in the future. The journal screen can also include the spiritual exercises so that an user may reference those when needed instead of generating a new one. One mightask:“Why use static journal entries when you can implement AI to summarize them?” These entries are meant for the user to write down their own thoughts, without the addition of AI changing or summarizing what they have written. As Dr.Bhavesh writes, there are advantages but also challenges in using AI accurately for meditation [8].

2.2. Image Generation System

In the image generation system, a common concern could be regarding the accuracy of the AIgenerated image in reflecting what the user wanted. In the app, there is a personality test that can be taken. The result of this test is a four-letter combination that represents the personality of the user. While exact interpretations may vary, there is a “Retake Test” button where the user can choose to regenerate a different image. Another concern is that the AI drawing may not accurately reflect how the user wants to appear. However, this tool is not a replacement for how they appear, but simply an illustration that supports their personality. The user can use the generated image as inspiration for themselves.

2.3. Spiritual Exercise

Some users may not trust the accuracy or legitimacy of the AI generated exercise system and question the use of it. As Leamarie and Lauren point out we want to avoid misinformation especially when it is being taught to people seeking help [7]. Our AI generated exercise system uses OpenAI’s bleeding edge model, GPT-4.1, which allows for accurate and precise information. It is also aware of its own limitations and will not give suggestions outside of its own expertise. We have programmed this model to be aware of the different spiritual exercises it is generating and to take this into account the user’s religion when responding to the user about certain topics.

3. SOLUTION

The application opens to a home screen with four buttons: Journal, Personality, Spirit, and Profile. The design is minimalistic to make it easy to navigate and some portions are more creative to display a more calming app environment for the user.

The home screen introduces the user to the app. It displays the name of the app, a daily quote, and a scenic background that changes every day. Clicking on the background hides the name of the app and quote so you can see the background unobstructed.

Clicking on the "Journal" button leads to a blank menu to add a journal entry. These entries allow a person to easily record their thoughts on the app and review them anytime. This menu can be used as a sort of diary to self-document one's routine, highlighting what works well and inspecting what needs work.

The "Personality" button leads to a menu that asks for one to input their personality. This information is then used to give Generative AI a better understanding of the individual. With the information, the AI generates spiritual exercises and practices on the "Spirit" menu, which uses information from the "Personality" menu to generate practices targeted towards individuals of certain personalities. When a meditation has been generated, the individual can decide whether they would like to save the generated practice to their "Journal" page.

The "Profile" button leads to the profile page. Users can change their name, birthdate, and religious preference, alongside viewing their total journal entries, as well as their total number of "Spirit" activities.

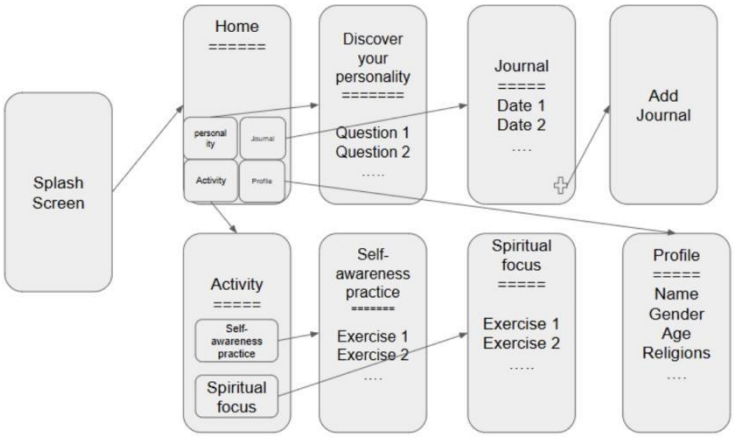

Figure 1. Overview of the solution

The Journal Screen allows users to add, view, or delete text-based entries. The information for each entry is stored in the cloud using Firebase and allows for easy and quick access of each entry from any device. Deleting the entry will display a prompt confirming if you want to permanently delete this. If so then it will remove it from view and remove it from the database.

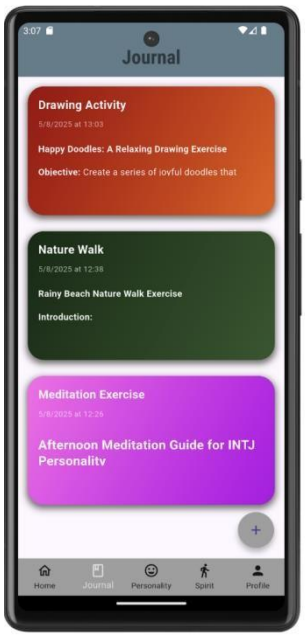

Figure 2. Screenshot of journal page

```
return ListView.separated(
  itemCount: entries.length,
  padding: const EdgeInsets.all(15.0),
  separatorBuilder: (_, __) => const SizedBox(height: 25),
  itemBuilder: (context, index) {
    final doc = entries[index];
    final data = doc.data() as Map<String, dynamic>;

    return Dismissible(
      key: Key(doc.id),
      direction: DismissDirection.endToStart,
      background: Container(
        alignment: Alignment.centerRight,
        padding: const EdgeInsets.only(right: 20),
        decoration: BoxDecoration(color: Colors.red, borderRadius: BorderRadius.
        child: const Icon(Icons.delete, color: Colors.white, size: 30),
      ),  // Container
```

Figure 3. Screenshot of code 1

This code shows how the journal entries are added, stored, and removed. The function ListView creates the layout for each entry that is on the database. It grabs information such as the title, content, and date of each entry and displays it in the appropriate spot. The colors for each of these entries is determined by the type of entry it is. If it is meditative then its color is pink, if it is a standard journal entry then it is blue, if it is a nature walk entry then it is green and so on. This allows for easier identification of each entry and differentiates them from one another. The dismissible is used to delete entries by swiping the selected entry to the left. Before permanently deleting the entry, a confirmation will appear asking if the user is sure they want to delete this. If so then the entry is deleted from the ListView and from the cloud database.

The Personality Screen allows users to view details about their individual personality. The screen first opens with a test to determine the personality type of a user. Then after entering the personality type, Dalle-3 AI will generate an image to visualize the personality. Lastly, the details of each personality like the pros and cons are displayed below this.

Figure 4. Screenshot of personality page

```
final openAI = OpenAI.instance.build(
  token: dotenv.get('OPENAI_API_KEY'),
  baseOption: HttpSetup(receiveTimeout: const Duration(seconds: 60)),

  enableLog: true,
);
// Build prompt from survey answers
final prompt =
    "You are a famous artist who has been asked to create an original image that appeal
    "- Main Theme: $personality, ${personalityNames[personality]}"
    "- It should not divide the "Main Theme" into separate parts of the image nor imply
    "- It should not contain any text, labels, borders, measurements nor design element
    "- The image should be suitable for digital printing without any instructional or g
    "- It should only contain the "Main Theme" and no other elements in the foreground,
    "- It should contain the "Main Theme" only once with no margins above, below or on
    "- It should not have any text and it should not have any characters or letters of
    "- It should be in the style of ${artStyle == "choose" ? "Cartoon" : artStyle}}";
final request = GenerateImage(model: DallE3(), prompt, 1, size: ImageSize.size1024, res
try {
  final response = await openAI.generateImage(request);
  final imgUrl = response!.data?.last?.url;
```

Figure 5. Screenshot of code 2

This code shows how OpenAI's Dalle-3 is used to generate an image corresponding with the user's personality. First, the OpenAI API is used to communicate with the AI. There is a 60 second timeout where if the response from the AI takes longer than this it will cancel the request. The prompt must be given to the AI in order to generate the desired image. The parameters of the prompt are used to specify what type of image the AI should create. Certain parameters help to create a cleaner image such as specifying no words, blank background, no labels, no overlapping elements. The first parameter enters the letters representing the user's personality type with the name representing this personality. The last parameter specifies the art style the image should be in. Lastly, a request is made to the AI that generates a URL to the image which is then saved to the user's device.

The Spirit Screen allows users to choose their own meditative exercise from an expansive list. There are six pre-made exercises and an additional custom exercise at the bottom that allows for any type of meditative practice. When clicking on these exercises a user has the option to enter specific details such as the amount of time they want to spend, where they want to spend it, and

the goals of each exercise. Afterwards, OpenAI will generate a tailored meditation for the user to follow.

Figure 6. Screenshot of spirit page

```
Widget _buildActivityButton(BuildContext context, String title, IconData icon, int color1, int color2, VoidCallback onTap) {
  return GestureDetector(
    onTap: onTap,
    child: Container(
      decoration: BoxDecoration(
        gradient: LinearGradient(colors: [Color(color1), Color(color2)], begin: Alignment.topLeft, end: Alignment.bottomRight
        borderRadius: BorderRadius.circular(15),
        boxShadow: [BoxShadow(color: Colors.grey.withOpacity(0.3), spreadRadius: 1, blurRadius: 5, offset: Offset(0, 3))],
      ),  // BoxDecoration
      child: Column(
        mainAxisAlignment: MainAxisAlignment.center,
        children: [
          Icon(icon, size: 40, color: Colors.black),
          SizedBox(height: 8),
          Text(title, style: TextStyle(fontSize: 16, fontWeight: FontWeight.bold, color: Colors.black)),
        ],
      ),  // Column
```

Figure 7. Screenshot of code 3

This code shows the creation of each exercise card. Since there are six of them and they have similar shape and functionality, the code is modular and is reused for each of the meditations. This function specifically takes the name of the exercise, the icon associated with it, the colors of the exercise, and what should happen when a user clicks on it. All of this information is then put into the correct spot and used to create a unique exercise card. Specifically, the colorsare put into a gradient in the order they were entered. This design allows for easy creation of additional meditative practices if requested and also allows for high maintainability and effortless updates to any of the existing practices. From the user's perspective this also means that implementing a custom exercise card, defined by the user, would not take much effort.

4. EXPERIMENT

To test how well the application fits with the target audience, I collected user feedback using a survey. This allows me to better understand how intuitive, engaging, and helpful each feature of

the app is, especially the meditative features. This experiment would help improve design and enhance user satisfaction.

I created a 10-question survey that assesses the functionality and user experience of the most important features of my app. The questions reflect the app's goal to support emotional expression through creativity. The feedback will identify which features are working well and which ones need improvement. Each question is scored on a scale numbered 1-5 (1 = strongly disagree, 5 = strongly agree).

The questions are as follows:
The app was easy to navigate and understand.
I found the AI-generated meditative practices to be helpful.
I found the journal entries to be helpful
The journal entries helped me organize my thoughts
The app created a relaxing environment
The app was straightforward to use
I found the homescreen to be peaceful
This app made me feel productive
I found the meditative practices to be fun
I found the meditative practices to be innovative

Question	User 1 (JT)	User 2 (AS)	User 3 (Dad)	User 4 (Aunt)
1	5	5	5	5
2	3	3	5	4
3	4	5	3	5
4	4	4	3	5
5	3	5	5	5
6	4	5	5	5
7	4	5	5	5
8	3	5	4	4
9	4	4	3	3
10	5	5	4	4

Figure 8. Table of experiment

Figure 9. Experiment results

Considering the sampled data, it is safe to conclude that the app has relatively positive results, particularly regarding Kabala's simple structure and innovativeness. In order to get a more inclusive sample, this survey was given to two young adults (Users 1 & 2) and two older adults (Users 3 & 4). Recipients took the survey after using the app for a day.

The average scores for each of the questions were:

Q1: 5
Q2: 3.75
Q3: 4.25
Q4: 4
Q5: 4.5
Q6: 4.75
Q7: 4.75
Q8: 4
Q9: 3.5
Q10: 4.5
Overall: 4.3

The answers to questions 1, 5, 6, 7, and 10 were overwhelmingly positive, with over 90% of respondents expressing satisfaction.

In contrast, 2 and 9 did not have as great a response in comparison. Q2 mentioned the helpfulness of the generative AI meditation practices. Meditative practices and equivalents are not frequented by younger individuals, which reasonably explains why the two younger users may have found the AI-generated meditations to be unhelpful. Furthermore, this app is meant for long-term, neardaily use, which may explain why this app did not grow on the users. Q9 is similar in that regard, as the app did not have time to grow with the users, and how many people might not find meditative practices to be particularly 'fun.'. However, the initial feedback and reaction for all the users is positive, leading to a preliminary validation of the project's direction and a promising outlook for further adoption.

5. RELATED WORK

Adam Burke and his co-authors explore the idea that meditation is useful among adults in the United States [1]. They specifically focused on mantra, mindfulness, and spiritual meditation.

Their method was to sample a portion of the population and ask questions concerning their meditation practices. In these questions there was one about the results of their meditation over the years. Their conclusion was that meditation has value for supporting mental health and emotional well-being. In our app we explore the effects of multiple different meditative practices including those in Burke's research with the addition of calming practices like nature walks and drawing. Our app also includes resources and steps to try out these different exercises.

Nisha Rao and Kathi Kemper talk about using online meditation modules to help health professionals have more compassion and gratitude during their work [9]. Almost 200 health professionals were enrolled in this study and the results concluded with a noticeable improvement to gratitude, well-being, self-compassion, and confidence. Our app leverages the use of AI in order to create meditative exercises as opposed to online meditation modules used here. Our meditation practices can be either emotional or physical exercises in order to cater to a diverse audience. Our system also allows for more experimentation through different forms of meditative practices.

John Astin studied 28 volunteers over an 8-week period to determine whether mindful meditation was beneficial [3]. His method was to have half of the individuals follow a meditative program and the other half do nothing as a control. His conclusion was that after the 8-week, the meditative individuals had fewer mental health symptoms, a stronger sense of control over their lives, and higher scores on questions about spiritual experiences. Our method of spiritual exercise doesn't have a set time like Astin's did which can be seen as both a pro and a con. In one sense this means that individuals have no set time for how long or how frequently they meditate which allows freedom. In another sense this means that individuals don't have anything keeping them accountable for their meditation.

6. CONCLUSIONS

The app is very robust in terms of features and efficiency but there are some limitations to what it can accomplish. The first limitation is that the journals don't have a way to sort through each entry. The default sorting of the journals is by time; the earliest journal entry is at the top. However, if a user wants to search up an old journal entry there is no easy way except to scroll down until they find it. An improvement in this would be to add a search function or filter function. Another limitation is the options available for meditative exercises. Currently there are five different options to choose from but adding more options would be beneficial to a larger audience. Alternatively, allowing users to enter what meditative practice they want to do would open the door to every exercise in the past, present, or future. One last limitation is that the personality screen is not tailored to the individual and their meditative practices. Currently the personality screen only takes into account the user's entered personality, it does not change or suggest exercises based on the user's interaction with the app which is our target goal. The app should be dynamic and change according to how it is used.

If we were to expand upon this project, adding an accountability screen would be the next improvement. This would allow users to connect with a friend and share their meditative times and practices in order to encourage consistent use of the app. The effects of having an accountability partner for meditation are explored in Galante's research [4].

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