Milestone 1

The Problem:

According to the World Health Organization, mental health is defined as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community”. This is significant because it supports the idea that one’s mental health is an essential factor into a person’s overall health. So, if a person is extremely stressed for a long period of time, then there is a high possibility that this can lead to other serious health problems. In addition, mental health has the ability to affect anyone regardless of a person’s age, sex, social status, etc. In fact, statistics shows that there are at least 450 million people around the world suffering from a mental health disorder.

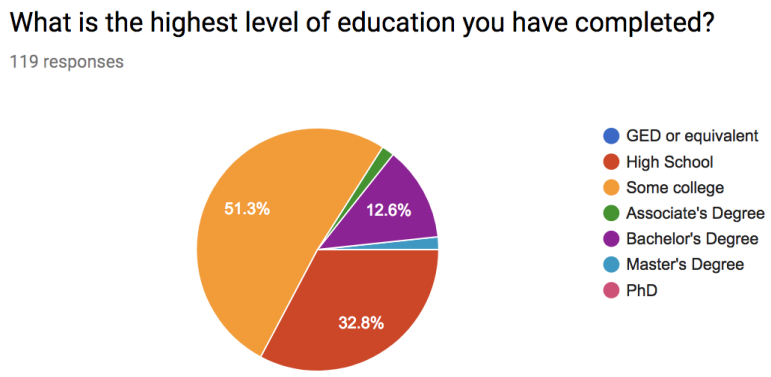
There are treatments available for those living with mental health disorders. However, there is a negative stigma surrounding the topic, which is a major reason as to why people do not seek the help they need. Additionally, the World Health Organization reports that nearly two-thirds of people with a known mental disorder do not seek professional help. On the other hand, there are people with little to no social and/or economic status, which prohibits them from accessing treatments for their mental health problems.

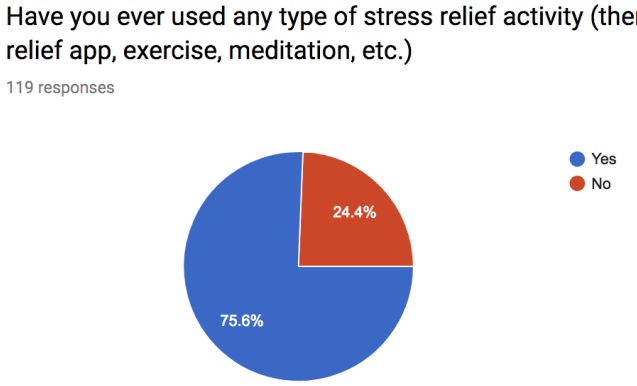
As a solution, the group has decided to create a mobile application, which aims to be an accessible, convenient, and interactive alternative to existing mental health treatment options. Our application will primarily focus on promoting improving the general mental health of its users, specifically stress, through exercise activities and mediation practices. Overall, this paper

will highlight the users, existing solutions, task analysis, and task environment regarding the system.

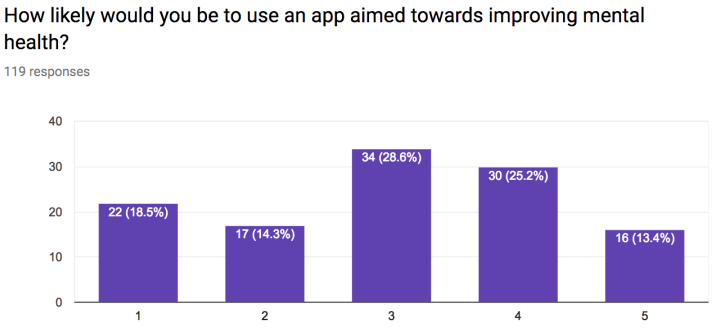
The Users:

The intended target group for this application are young adults, specifically individuals whose ages range from 18 years of age to 35 years of age. This target group was selected because it is the general age range when a larger number of mental health disorders, psychiatric illnesses, and neuroses begin to manifest and mature within an individual as a consequence of either biological predetermined factors or maladaptive responses to pressures and changes from the social environment. Results from our conducted survey showed that out of 82.4% of college-age students, 61.4% of users would be likely to use an app aimed towards improving mental health (2018, Idaewor et al). Furthermore, 75.6% of all people interviewed have utilized or participated in a type of stress relief activity in their lifetime. Though the target group was selected for said reasons, the target group still is inclusive of those both with and without a mental health condition and those of poor mental health standing as well as those with in excellent mental health.





As a result, the design layout, features, functions, and capabilities for this application were set according to what would be the most favorable to said target group. However, despite this fact, there are no functions within the application's interface that would be a hindrance to those individuals who are not within the target group (persons younger than 18 years of age and persons older than 35 years of age). Furthermore, although the application is designed to improve one's mental health and wellness, it is not specifically targeted towards those with an underlying mental affliction or a predisposition to such. Apropos, any user not representative of the target group should be able to use the application with relative ease and little difficulty while also finding it beneficial to their overall state of well being.



Although the application was intended primarily for usage by those within the target group, they are not the user community that has or will have the most impact on the implementation and success of the application. Users with a high influence on the application and its workings stem from those who are deeply involved in the development process. This can include, app

developers, team and project leaders, PR and marketing staff, and those who operate within the mental health profession. Such individuals serve as this application's promoters as they naturally have a vested interest in the app's success whether it be for personal satisfaction, monetary gain, or a desire to see the improvement of mental health within the general population. Because of this, what this subset of users says and potentially could say was viewed with high regard and esteem in the development process and will again be looked at with similar fashion in any future application changes. Other potential users in groups do share a high interest in the application's functions and success such as competitors, reviewers, review sites, and app stores but because of their nature as simply a defender group their potential criticisms did not have a high impact on the application's design.

Those of teenage years were also a large influence on the development process as they too can suffer from the same mental illnesses as the young adult target group, even though they do not have a vested interest in the app's success. It is was important in development that the app would also be effective for this latent group considering its aim at the improvement of mental well being, perhaps even more so as said group is often unaware of what would be considered "good mental hygiene."

As can be said of physical health and well being that "there is no such thing as being too well," the same attitude is implemented with our application. However, users who would be adherers to this mantra (those in excellent health) are less likely to have an interest in the application or its success. Such apathetic users provided little influence over the development process as the likelihood of them using the app is quite low. Among this subgroup of users would

also be those who for personal reasons are uncomfortable or skeptical of the methods that the app implores.

Existing Solutions:

University Libraries Heuristic Evaluation Checklist

Mobile App: Pacifica Description: Anxiety, stress, & depression relief based on CBT &...

Heuristic	Rating	Comments
Appearance/Aesthetics – First impressions are important – it can make the difference between users staying or leaving your site.		
Primary goal/purpose is clear	☆ ✓ ✖	Emphasis on relaxation right off the bat
Clean, simple design	☆ ✓ ✖	
Pleasing color scheme	☆ ✓ ✖	Very soothing to the eye
Appropriate use of white space	☆ ✓ ✖	
Consistent design	☆ ✓ ✖	
Text and colors are consistent	☆ ✓ ✖	
Icons are universally understood	☆ ✓ ✖	
Images are meaningful and serve a purpose	☆ ✓ ✖	Images give you a look into each activity
Content – Users are at your site for the content – make it easy for them to find and use your site.		
Major headings are easy to understand	☆ ✓ ✖	
Easy to scan	☆ ✓ ✖	
Minimal text/information presented	☆ ✓ ✖	App is primarily auditory
Clear terminology, no jargon	☆ ✓ ✖	
Links are clear and follow conventions	☆ ✓ ✖	
Help is available on every page	☆ ✓ ✖	Can't really find help button
Important content is above the fold	☆ ✓ ✖	N/A
Search box is easy to identify and easy to use	☆ ✓ ✖	N/A
Navigation – Makes getting around your site easy and takes out the guess work of a user's visit.		
Consistent Navigation	☆ ✓ ✖	
Easy to identify your location on the site (breadcrumbs, headers, colors)	☆ ✓ ✖	
Consistent way to return Home	☆ ✓ ✖	
Limited number of buttons & links	☆ ✓ ✖	Not overbearing, but definitely aa lot of options
Organization of information makes sense	☆ ✓ ✖	
Efficiency/Functionality – Following basic rules will keep user frustration to a minimum.		
App loads quickly	☆ ✓ ✖	Not consistent in loading times
Error messages are meaningful	☆ ✓ ✖	
Proper etiquette for links off site	☆ ✓ ✖	
Contact information is easy to find	☆ ✓ ✖	Unable to locate
Login is easy to find	☆ ✓ ✖	
No broken Links	☆ ✓ ✖	
User knows if they are logged in/out	☆ ✓ ✖	
System supports undo & redo	☆ ✓ ✖	

UMKC University Libraries Usability Team - Kelley Martin, Usability Testing Coordinator

Comments: Pacifica is another stress relief app that requires a subscription to unlock all of its benefits, at $8.99/mo, $53.99/yr, or $199.99 for a lifetime. The meditation and stress-relief aspects can't be fully enjoyed without this subscription. However, this app introduces features that are lacking in other apps, such as a mood journal, a chat board, and daily stress news. In addition to this, the app establishes goals with you in the very beginning and is able to check in with you whenever you would like throughout the day.

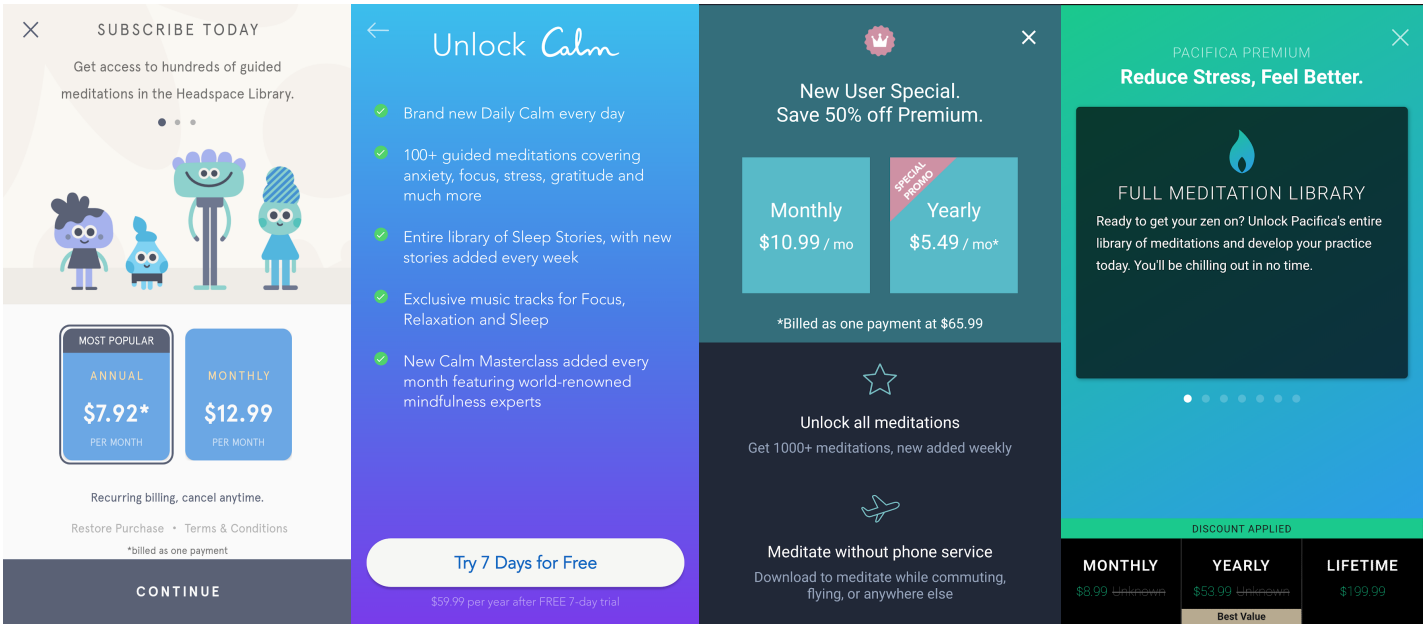
(Heuristic evaluation template provided by UMKC Libraries Usability Team; the presented evaluation was performed on the app Pacifica)

The goal of our mobile app is to aid in the reduction of stress and promote healthy minds, so we explored the mental health apps that currently exist on app stores in order to develop an

understanding of how other apps are solving this stress crisis. Using a modified template originating from the University of Missouri-Kansas City Libraries Usability Team, an evaluation was performed on the following eight apps: Youper - AI Therapy, Stress Management, Daily Mudras, Simple Habit Meditation, Calm, Headspace, Breath Ball, and Pacifica. Each evaluation was sectioned into four categories (heuristics): appearance/aesthetics, content, navigation, and efficiency/functionality. There were certain characteristics within each category that we assessed and rated using a star, a check mark, or an "x" to denote our satisfaction levels. By "grading" each app on these specific aspects, we were able to single out the features that we found to be desirable and the features that we found to be troublesome. An example of one of our heuristic evaluations is provided above.

After conducting our evaluations, we discovered several problems that persisted from app to app that we feel are necessary to improve upon when developing our own app. For starters, it was often the case that we could not find any contact information such as an email, and for those that we did locate this information for, some digging was required in order to find it. Since a mental health app should be based around our users and the idea of improving their mental health, we feel that the users' feedback should be one of the most valuable pieces of information any developer can receive. In addition to this problem, more than half of the apps that were reviewed were primarily text-based. That is, the user would not only have to find the exercise they wanted to perform, but would also have to read a bulk of text (with no pictures for demonstration) to figure out the steps for doing the exercise. These steps were simply typed out and did not engage the user in any type of interaction. This may work for some tasks such as performing physical exercise or yoga, but other tasks like meditation would perhaps work better

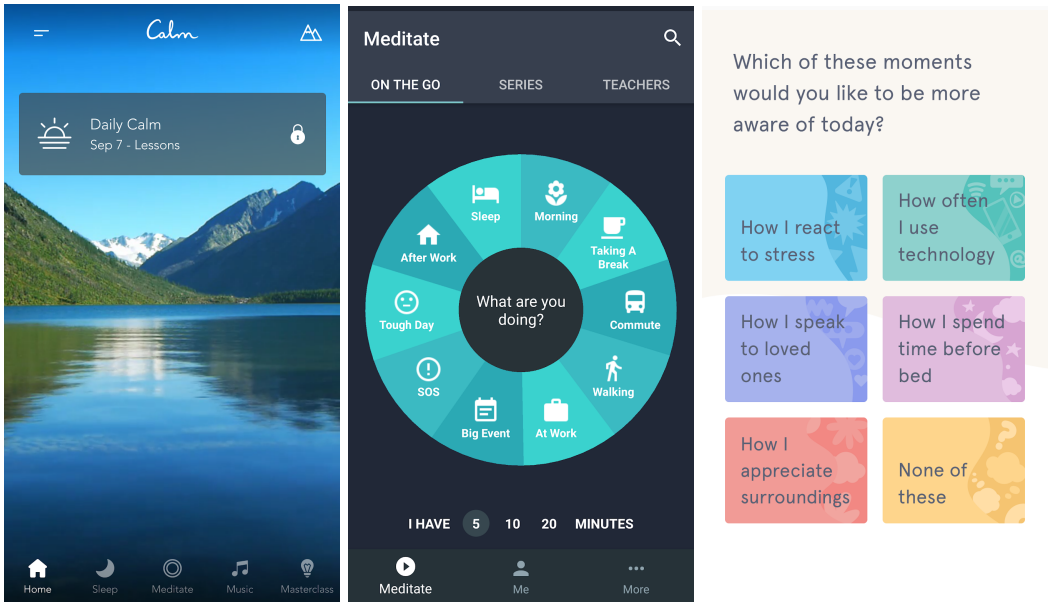
with audio so that the user can focus inwards rather than on his or her phone screen. The last and most outstanding issue that was consistently found was that nearly all the apps required a subscription of some sort in order to fully utilize all the resources they had to offer, as seen here:



(Images screenshotted within each app; names from left to right: Headspace, Calm, Simple Habit, Pacifica)

While it is understandable to charge for the services the app provides, we concluded that this would not be a favorable feature to have in our own app, especially with our target users in mind. Young adults and college students are already confronted with a wide range of charges in other aspects of life, and this app needs not contribute further to this issue. A large portion of the low-rating app store reviews for these apps stem from the fact that these subscription payments dictate the amount of functionality the user has access to, and these sentiments would be further shared with our app if we chose to implement this feature. There were a few other minor issues that were discovered during this exploration phase that we will address, but we felt that these three problems had the greatest impact on our overall experiences with the apps.

These evaluations may have brought out features we ought to avoid when developing our app, but they have also brought many unique ideas to our attention, in terms of both user interface and app functionality. Simple Habit Meditation by Simple Habit, Inc. introduced an idea in which the user selects his or her current action and the amount of time he or she has in order to provide the user with an audio recording that will best aid him or her. This is not only very appealing to interact with but also very catering towards the user's needs. Pacifica, by Pacifica Labs, introduces the abilities to maintain a mood journal, to discover daily mental health news, and to chat with other members of the app's community in a Facebook-esque format. This app was one of the more popular choices available on the app store, and that can be attributed to the wide arrange of tools the users have at their disposals.



(Examples of user-friendly designs that we found; app names from left to right: Calm, Simple Habit Meditation, Headspace)

From looking at very basic details, such as color choice and icon choices, to looking at the finer details, we were able to determine the features we both want and do not want in our app, and we

hope to be able to follow through with our plans to ensure that our users get the best experience possible.

Task Analysis:

There are four major tasks involved in the intended application: navigation within the application, interaction with activities, connection with other users, and submission of content.

The first major goal of the user is to navigate the application so that they can interact with their user account and save information for later. This goal is common to most web and mobile applications; users must have set ways of navigation that are easily understandable for that target group. Within navigation, some users might find certain means for navigation easier than others, for example: some people prefer to use keystrokes over mouse movement. The stated target group of this application is college students, specifically of ages 18 to 35. This age group tends to have a high enough technological literacy that the user can be assumed to understand basic navigation of the system, meaning some complexities in the user interface will be tolerable and the task of navigation can have more subtasks than other age groups might permit.

The task of application navigation is composed of four major subtasks: registering a personal account, logging-in to a personal account, navigation between major application pages, and interaction with stored account information. The app must be able to manage user accounts and store information on each user. In order for users to associate their information with an account, the user must create a new account with a valid username and password, then enter information to associate with this username. After doing so, the user can log-in to the system using that same account information, taking the user to the main pages of the application. A user

will now desire to navigate the application. One page that can be navigated to is the account information page where users can view and change information about their account.

0. Interact with system
    1. Register New Account
        1.1. Enter unique username
        1.2. Enter unique password
        1.3. Enter personal information
        1.4. Create Account
    2. Log into application
        2.1. Navigate to Login Page
        2.2. Enter User Information
        2.3. Begin Authentication
    3. Navigate the Application
    4. Interact with stored information
        4.1. Navigate to user account page
        4.2. View Stored User Information
        4.3. Alter Stored User Information

A new user will complete tasks in order of 1-2-3-4, an already registered user will complete tasks in order 2-3-4, and a returning user who is already logged in will complete tasks in order of 3-4.

Another major goal of the target users is to interact with in-app activities so that they can improve their mental health. The activities users partake in can drastically influence the spatial

and social requirements of the user; these activities range from a meditation which can be done nearly anywhere, to an exercise circuit that can only be done in a gym. In nearly all cases though, the user will need to move at least somewhat. A meditator will likely move to the ground to sit. A yoga student will move for the majority of the exercise. A mobile device supports movement of users. Mobile running apps have found great success on app stores (Aroni), proving that many people are more than comfortable using their phones during intense movement.

As stated previously, the target user group is college students. This group tends to have access to large public spaces and various community areas, which could provide the perfect area for the more intense and space requiring activities on the app. The target group, college students, also tends to be an age group that is in good physical health, allowing the group to partake in more rigorous exercises that couldn't be recommended to other less healthy age groups.

The task of in-app activity interactions is composed of two major subtasks: searching for content and interaction with content. Searching for content allows the user to search through all available user activities so that the user can partake in an activity that is applicable to their current desires and constraints. Listening to an activity allows the user to interact with the application in some way so that they can perform a single activity.

0. Listen to guided activity

1. Search for content
    - 1.1. Access Search Page
    - 1.2. Enter Keywords/Browse Topics
    - 1.3. Begin Search
2. Interact with Content

2.1. Start Activity

2.2. Interact with Activity

2.3. End Activity

Another major goal of the target users is to connect and meet with other app users to complete a set activity, so that the user can improve their mental health through group activity. Due to the social requirements of this goal, users must be able to use the app while visiting foreign locations. One convenient device for continuous app usage like this is a mobile device. This goal is made easier by the target group of college students, who tend to have access to communal areas that could serve as good meeting points for users.

The task of group connection is composed of four subtasks: Search for an activity, Join an Existing Activity Group, Creation of an Activity Group, and Interacting with an Activity Group.

0. Connect with other users

1. Search for specific activity
    a. Search for a specific group activity
    b. View a list of existing activity groups based upon user criteria
2. Join an Existing Activity Group
    a. Browse existing user groups
    b. Select User Group
    c. Join User Group
3. Create a User Group
    a. Select group activity

    b. Enter Group Logistical Information
        i. Select group meeting date
        ii. Select minimum number of group members
        iii. Set group join deadline
    c. Submit group information to the public
4. View Logistical Information
    a. Navigate to an individual activity group page
    b. View Logistical Information about the group

A typical user will complete subtasks in order of 1-2-4, while users unable to find a group using the previous task ordering will complete subtasks in order ot 1-2-3-4. Someone who has already joined an activity group will simply complete subtask 4 for more information on that activity group.

A final major goal of application users is to submit content to the application so that other users can view and share that content. This goal requires a higher level of user-computer interaction than the other goals, as users will have to submit and provide information on the content they have already produced. This task, due to its complex nature, could be beyond the capabilities of a mobile device, and require access to a desktop computer. This task however, could likely be completed in many locations as it won't require significant movement. Completion of this task is less affected by age, and more affected by the user's technical skills.

The task of content submission is composed of three main subtasks: navigation, uploading of content, and final submission of content. Navigation requires the user to navigate to

the user submission page, uploading content requires the user to upload a file containing an activity to the submissions page along with pertinent information, and then a final subtask of submitting the prepared content is required to make the content accessible to all users.

0. Submit user created content
    1. Navigate to User Submission Page
    2. Upload Content
        2.1. Upload file containing Already Prepared Content
        2.2. Enter Information about Content
    3. Submit Content

Task Environment:

It is important to realize two major characteristics of the task environment: the range of activities in the environment, and the positive influence on connections between people.

Currently, people complete a wide range of activities in order to reduce stress. Some activities proven to reduce stress are exercise and meditation. According to a study done on the effects of exercise on limiting stress, “analyses revealed that the negative impact of stressful life events on health declined as exercise levels increased” (Brown). Exercise is therefore a potential activity that could be included in the task environment. According to a study on the clinical implications of mindfulness meditation, there is “strong evidence that an intensive mindfulness-based stress reduction intervention such as the SR&RP (Stress Reduction and Relaxation Program) can provide a clinically effective treatment for medical patients who also have anxiety disorders” (Miller). These results could mean that meditation is a potential activity

that could solve the problem of stress reduction. Completion of these activities will be a major portion of the task environment. Along with the activities of the environment, relations between people can be an important factor in stress reduction.

One major solution for improving health is to encourage social relations between people through the completion of an activity together. It has been found that communities of people are able to work together to exercise better. “In type 2 diabetes, supervised group-based and Internet-based exercise can improve equally glycaemic control, waist circumference, and quality of life, and both are better than simply counselling” (Akinci, Buket. 2018). Working with a group of people that are in a similar situation worked better than one-on-one counseling in this case, resulting in better health measurements. It is possible that the same could be said for stress reduction, where group activity is more successful than one-on-one activity at reducing stress and improving mental health.

Conclusion:

College students have a plethora of issues that they face in their college career such as demanding classes, lack of financial stability, lack of a stable food source, and isolation from family and certain friends. All of these issues can develop or enhance feelings of anxiety, stress, and depression. Most students struggle to maintain effective time management to allow for academic success as well as emotional, mental, and personal success. Therefore, we envision our app to optimize the improvement of mental health for college-age students who often have complex and full schedules with few time allocated to dedicate towards improving their mental health. Through our research, we found apps with similar functionality, but discovered that a lot of these apps required compensation or lacked an integrated social

platform. In addition to giving users a plethora of stress-relieving activities to choose from, users can enhance their social development as well by completing tasks with other users in a close proximity.

Furthermore, our interviews and research on solutions brought forth additional design implications:

- Having a user-friendly interface, so users who are older or younger with less technological skill are able to easily navigate the app
- Integrating the app with social platform to connect users across their various communities/college campuses
- Making the app free-of-charge in order to provide access to users who are not financially stable
- Allowing users' to bookmark or save information from their previous session to allow flexibility and accessibility for students' with busy schedules
- Allowing users' to leave live feedback in order to make way for the addition or removal of functionalities

Data collected from our survey also provided insight on the level of familiarity in which college age students have with apps aimed to improve mental health. Most of our survey participants have no experience with such an app, so we intend to design the app allowing users to easily navigate the app. We intend to look at apps with similar functionalities that are commonly used by our target users and design our app in a similar way in order to expedite the learning curve. Furthermore, our target users can be

characterized as individuals located on or near a college campus where there are several communal activities and organizations. Allowing users to connect with each other and ensure accountability for maintenance of their own personal mental health will boost consistent participation. Additionally, for every college-aged student who has access to a gym on campus or in their neighborhood, there is one other student who does not have reliable access, so we aim to design our app in a mobile-friendly way. Any activity on the app will be able to be completed in any open area or outside space without requiring access to a local gym facility.

However, one of the most challenging parts of the app design is integrating the activities with a social platform to allow users to connect. Future user studies will be focused on the most efficient way to ease connectivity with other users. We will continue to conduct research and surveys to find the most time and cost-efficient methods to develop a multifaceted app that not only engages users, but also retains a high consistency of utilization. The success of the app will be gauged by the level of engagement by not only target users, but also users of low influence and low interest.

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