AggieSpace*

An App for UC Davis College Roommates to Connect

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ABSTRACT

The product that we developed was a digital application that emphasized care giving and receiving for UC Davis college students living with roommates. We approached this project using a user-centered design approach and followed a design thinking process that had stages of empathizing with users, defining personas, ideating ideas, developing prototypes, and testing our final product. First, we empathized with users through a survey and multiple rounds of interviews. Second, we defined two personas and organized pain points to consider throughout our project. Third, we ideated possible ideas as a team and converged to a single solution. Fourth, we developed prototypes using a variety of software tools such as Miro, Figma, and code.org. Finally, we tested our final product and conducted interviews to gain user feedback. The purpose of our project was to encourage UC Davis college students living in dorms to build better bonds and create more meaningful connections with each other.

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CCS CONCEPTS

• Human-centered computing

KEYWORDS

Human-Computer Interaction, User-centered Design, Roommate App, College Students

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1 Introduction

Problem: The main problem we were looking at was that UC Davis college roommates often struggle with bonding and caring for each other. Roommate searching systems are adequate for finding similar interests, but it is difficult for people to take the first steps in communicating with others in their living spaces. This was found in various groups such as first year students and second year students living in either the dorms or an apartment complex on campus. A lot of people found it awkward to interact with their roommates and these doubts ultimately turned into feelings of loneliness. These feelings of loneliness would not be healthy, especially for a college student who needs an inclusive environment and active support from their peers. Because of this issue, we proposed to design and develop a digital application called AggieSpace for UC Davis college students to better connect with each other.

Motivation: Our motivation for creating this project was because forming meaningful connections between college roommates is essential, as students often rely on each other for assistance. This can include tasks such as room chores, advice for school, and emergencies that may occur. There are multiple instances where college roommates may feel shy and insecure to seek help from their other roommates. This can lead to feelings of anxiety and hopelessness where other roommates would have trouble understanding without some form of digital communication.

Traditional methods of bonding, such as early face to face introductions or verbal expectation-setting, can feel awkward or intimidating for many. Given this challenge, we were motivated to design a digital solution that makes the process of building connections more natural, inclusive and enjoyable. Recognizing that many college students are already comfortable using mobile applications for social interaction, we saw an opportunity to create a playful, lightweight application to the UC Davis community.

Our Solution: We created AggieSpace to help address the issue of the lack of care giving and communication that is commonly found in the UC Davis dorms and community. Unlike other digital apps like Instagram or TikTok, we incorporated a daily care messaging system and playful activities to emphasize care giving. Through an HCI design thinking process and user-centered approach, we were able to ensure that our product focused on our target users' needs when it comes to living with other college roommates. These needs included making the features of the app engaging, natural, supportive, and easy to navigate. Ultimately, our goals were to ensure that roommates felt more comfortable with each other and cared for each other when they needed it. This is crucial to ensure an inclusive environment and a healthier living situation.

2 Background

The transition in college life often presents social challenges for students, especially when it comes to connecting with unfamiliar roommates. Existing research in HCI and user-center design highlights the importance of social support systems in improving student mental health and academic engagement. While traditional solutions–like in person icebreakers or roommate contracts have been the norm. The digital tools can offer new ways to bridge gaps in communication and empathy among students.

AggieSpace is designed specifically for UC Davis on-campus housing students, recognizing the unique needs of a diverse student population. The application combines playful activities (such as Would you Rather and Spin the Wheel etc.) with emotional care features like "Daily Care Messages" to support both fun and empathetic interactions. Our background research and peer interviews showed a strong desire for tools that go beyond utility—tools that help make shared college life feel more supportive, inclusive, and less isolating.

3 Design Method

We followed the standard HCI design method to design the app. First of all, we empathized with the potential target users by creating a 8-question google form and sharing the form to a considerable number of students who live in the UC Davis student dormitory to fill out the survey. After we got a certain amount of key findings and results from the survey, we defined the target users and constructed the initial point of view of the app that's based on users' needs by creating two personas. In order to prepare well for the prototype, we brainstormed some features of this app(eg.care message & roommates activities), which is the stage of ideate. Then we started to prototype. For the low-fidelity prototype, we created two storyboards with Miro, which described the expected scenarios of users' interaction with the app and some basic functionalities the app was expected to have. Following the lo-fi prototype was our initial interview, where we got feedback about the signup section, group/room functionality, and activity section. Based on this initial feedback, we created the mid-fidelity prototype with Miro, during which we began to focus on basic app features and functionalities, and sketched the app with a mixture of Miro templates. Following the mid-fi prototype was our second interview, where we got feedback about visibility, icon, and aesthetic. Later on, we created the high-fidelity prototype with Figma, during which we adjusted, recreated, and combined some sketches from the mid-fi prototype. We also added color to the UI, which made the original sketches look more real and closer to the actual product. From the third interview for the hi-fi prototype, we got more feedback from feedback, constraint, and accessibility. Finishing the prototype stage, we created the initial app with code.org, during which some basic functionalities were implemented. Finally, we conducted user testing, and got some constructive feedback on the ambiguity and error prevention. The rationale for following this design process is that this process reflects the feature of "step-by-step" and the involvement of both designers and users.

4 Understanding the Users

We conducted our study by firstly creating an initial google form survey that consisted of eight questions that were sent to our target users to gain more insights into their needs and wants when it comes to living with college roommates. Through this survey, we were able to collect data in the form of individual responses. Based on the surveys and interviews results with our target users, we analyzed our data and found that UC Davis College students living in on-campus housing or Davis apartments who share common spaces and want easier, less awkward ways to connect with roommates, we discovered that: 1. Many students reported feeling lonely or awkward when trying to start conversations with new roommates. 2. Roommates have thought of using apps to create bonds with their roommates. 3. Most room members have had a time that they want to connect more with their roommates.

Based on these ideas, we created personas that reflected our core user groups. For example: Bob Williams, a shy first-year international student who struggles with initiating conversations in English and wants casual, low-pressure ways to engage. Jack, a Junior student who decides to live on campus but feels uncomfortable communicating with his roommates, thinks of finding an app to involve everyone in the app. From the data we learn that users favored quick, proximity friendly mini-games that convert daily co-presence into moments of bonding. Students valued a lightweight Daily care channel such short supportive messages that normalize checking in over open-ended conversations that can feel contrived. This motivated us to de-scope standard social media functions and emphasize caring interactions. International students and multilingual households highlighted translation and clear icon, later prototype feedback reinforced needs for divisible navigation affordance.

5 Conceptual Model of Design

Our design is a mobile application that includes digital activities and care messaging features. The activities help facilitate bonding between roommates due to how it incites conversations, giving users a natural way to interact with one another. It also gives students the opportunity to socialize outside of school, and takes account of their needs such as budget. Finally, our app adds a way to give emotional support to roommates through direct care messaging. This ensures that students feel cared for and included in their university life.

6 Prototyping

For our prototyping process, we went through three stages: low-fidelity prototyping, mid-fidelity prototyping, and hi-fidelity prototyping, and conducted interviews with our target users for each prototype stage to generate user feedback and iteratively improve our designs. For our low-fidelity prototyping, we started off by creating two storyboards as shown in figure 1 below.

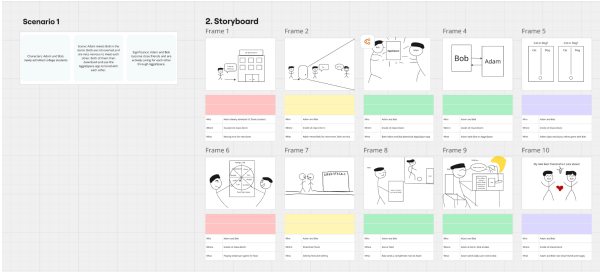

Figure 1: Low-Fi Prototype - Storyboard Using Miro (https://miro.com/app/board/uXjVJQmlV2o=/?share_link_id=144833308948)

In this storyboard, we developed characters, Adam and Bob, who are newly admitted college students. We depicted them using the AggieSpace app so that they ultimately became closer friends and actively cared for each other after using the AggieSpace app. We then received feedback for our low-fidelity prototype through an interview. Our interviewees suggested that we add a sign up section to the app in order to enhance visibility. They also suggested adding an activity section for users to play with each other in order to boost engagement and an overall enjoyable user experience. To take these into account, we then developed our mid-fidelity prototype in which we made a sketch of the app using Miro as shown in figure 2 below.

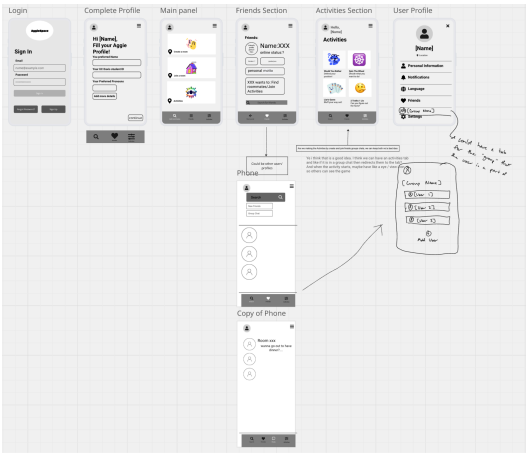

Figure 2: Mid-Fi Prototype - Sketch of App Using Miro (https://miro.com/app/board/uXjVJQ5e5tY=/?share_link_id=225977981352)

For this mid-fidelity prototype, we began focusing on basic app features and functionalities that our interviewees suggested. We incorporated a mix of sketches and our creative ideas to outline a rough sketch of our digital application. We then received feedback through an interview with our target users in which they suggested that we add colors and larger icons to our design in order to enhance visibility. They also suggested keeping the app simple but varied and navigable since too much stuff on one single screen can make the application confusing and not very enjoyable to use. We took this into consideration and developed our hi-fidelity prototype app design using Figma as shown in figure 3 below.

Figure 3: Hi-Fi Prototype - App Design Using Figma (https://www.figma.com/design/UobdOo76fnY5GxhRZXzGW4/AggieSpace?node-id=0-1&t=iERejDLMUixBLnCZ-1)

We then received feedback from our target users in which they suggested that we should add a back arrow for all screens so that there is a more consistent visual layout. They also suggested making icons change a different color when you click on them to enhance app feedback and ensure that the user can only have the activities with people that are from their roommate list to make an effective constraint. We took this feedback into consideration and developed our final product using the code.org platform.

7 User Testing

After we created the hi-fi prototype, we created the initial app with code.org. Then we let the initial product be tested by users. For the testing purpose, we let the users use the pre-defined email "bobw@ucdavis.edu" and the password "12345" to login to AggieSpace. Then they were able to see the home page with the menu of three main functionalities, which are "Add Roommates", "Daily Care", and "Activities". Demonstrated as figure 4 below.

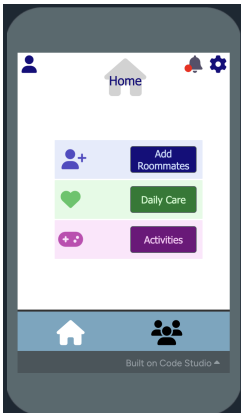

Figure 4: home page of initial product (https://studio.code.org/projects/applab/CdjgwTMGcjyQsUw0E6GF2kZTm0toa7UyvSVF_DP_kKc)

In figure 4, which is the homepage, the features and the corresponding functions are stated below:

1. Avatar icon located the top left corner: Click it and users can edit and save their profile and bio;
2. Bell icon located at the left of the gear icon: Click it and users can read the notifications from the system and the daily care message from their roommates.
3. Gear icon located at the top right corner: Click it and users can access the app setting. They can change the language, manage their accounts, change the privacy settings, and set on/off notifications there.
4. "Add Roommates" button in blue: Click the button, users can search roommates by emails and add them if the account correspond to email entered exists(For testing purpose, fake accounts with email addresses a@ucdavis,edu, b@ucdaivs,edu…all the way through f@ucdavis.edu were used for the fake roommates to be added);
5. "Daily Care" button in green: Click the button, users can send daily care messages to the roommates they have added;
6. "Activities" button in purple: Click the button, users can see the activities page. Demonstrated as figure 5 below.
7. House icon located in the blue bar at the bottom of the screen(left): Click it to go back to the home page at any time;
8. "Group" icon located in the blue bar at the bottom of the screen(right): Click it to see current roommates list.

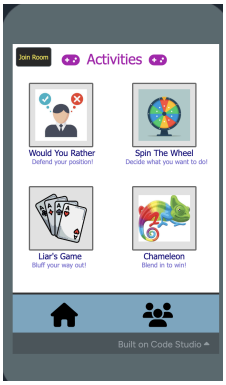

Figure 5: activities page of initial product

In the figure 5, which is the activities page, there are 4 activities available for the initial product, which are Would You Rather(Defend your position), Spin The Wheel(Decide what you want to do), Liar's Game(Bluff your way out), and Chameleon(Blend to win). To play one of the four activities, users need to create a room from their

added roommates(max room size of 7) to start the game. The “Join Room” button in yellow located on the top left corner allows users to search an existing room and send a request to join.

We got both the feedback on strengths and constructive feedback from user testing.
Main feedback on strengths are listed below:

1. With regard to overall format of the user interface, it’s concise and clear, which meet “**Aesthetic and Minimalist Design”** heuristic evaluation principle;
2. The blue “Add Roommates” button is also available in the roommates list page(by clicking group icon). Users don’t need to go back to the home page to add roommates, which reflects the **efficiency of use** to a certain degree;
3. Three different languages are supported currently, which makes the product usable by the non-native English speaking students. **Inclusiveness and Accessibility** are reflected to a certain degree.

Main constructive feedback are listed below:

1. Ambiguity: Some pictures(eg. Account management, language) next to buttons were interpreted as clickable.
2. Error prevention: Users may want to undo one action instead of going all the way back to the home screen. In addition, some actions need a confirmation letter before operation, such as clicking “log out” in the settings.

8 Discussion

After developing our care giving digital application, we learned that it is essential to follow a design thinking process in order for our final product to be a user-centered design. First, we learned that empathizing with users is important since this allowed us to gain further insights into user needs and wants. With our combination of surveys and interviews, we were able to gather useful user needs and feedback that helped us develop our designs stages and product. Second, we learned that defining personas and pain points prior to prototyping is crucial to understanding our users and overall objectives for designing our prototypes and developing our care giving app. Third, we learned that brainstorming and ideating as a team is a process that involves diverging and converging a variety of ideas that is necessary to understand each other’s perspectives. Fourth, we learned that prototyping involves multiple stages of designing and it is crucial to conduct user feedback to improve from one prototype to another. Last, we learned that testing our product involves multiple iterations and it is important to test to ensure that the product works as expected and satisfies our users’ needs.

9 Future Work

As for future work, we would like to have conducted more user testing and feedback from a larger sample size of our target users. Additionally, we wanted to incorporate some form of AI or chatbot powered by some large language model within the application so that it can make the app more user friendly and interactive with the user. We felt like the addition of an AI chatbot would have simplified the process of sending specific care messages and assist the user in creating their profile. There were also some issues related to roommate responsibilities that users complained about during interviews, so having a feature to delegate chores would help organize the process.

10 Peer Rating

Quanlin Li, 20%, major contributions to idea development, designing our low-fidelity prototype, and participating in the writing of proposal/progress report.
Hao Lu, 20%, major contributions to idea development, designing our mid-fidelity prototype, and participating in the writing of proposal/progress report.
Cory Pham, 20%, major contributions to idea development, implementing our final design, and participating in the writing of proposal/progress report.
Jaynor Singson, 20%, major contribution to idea development, conducting interviews for user feedback, and participating in the writing of proposal/progress report.
Danny Yu, 20%, major contributions to idea development, designing our high-fidelity prototype, and participating in the writing of proposal/progress report.