

# Fostering Community and Confidence for Women in STEM

CSC318H1: The Design of Interactive Computational Media

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## High Fidelity Prototype

### Launch Instructions

Prototype Link:

<https://www.figma.com/proto/TB9A6S5A3TqMp24EJUGMyd/High-Fidelity-Prototype?page-id=196%3A2108&node-id=196-2247&starting-point-node-id=196%3A2247>

To launch this prototype, click on the link above. You should be brought to the starting screen of the prototype. Installation of the Figma software is not required as it can be launched on any web browser.

### Solutions for A2 Issues

One issue that was identified in usability testing of our paper prototype was confusion around navigating to the ‘Messages’ or ‘Forum’ pages. The icons on the navigation bar were commented as being too similar and therefore caused participants to be unsure of which icons led to which pages (Figure 1). To address this issue, new icons were used as well as a label under each icon to further guide users to their intended pages (Figure 2).

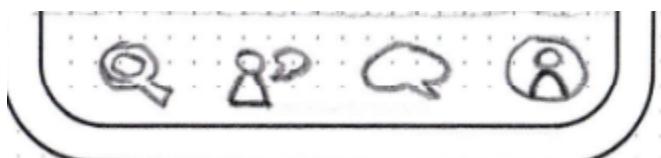


Figure 1



Figure 2

A second issue identified from the usability testing was the mentee and mentor request page and affiliated icons. The first prototype was created based on a user that identified both as a mentee and mentor to allow for flexibility for the user. This however, led to confusion among participants during testing and the team decided to narrow the scope and have a user who only identifies as a mentee for this high-fidelity prototype. The mentor flow will be revisited in our

next steps. To reduce confusion around messages and mentor requests, it was decided to separate them into two pages as well as use more conventional icons. Messages can now be accessed from the navigation bar to a specific ‘Messages’ page and the mentor requests are now accessible from the ‘Mentor’ page by tapping on the icon (Figure 4) to open the ‘Manage’ page where users can now view their connections with mentors and requests they have sent to potential mentors (Figure 5).

Additionally, to stay consistent with the plant theme without using icons, it was decided to apply the theme to the colour and branding throughout the app.

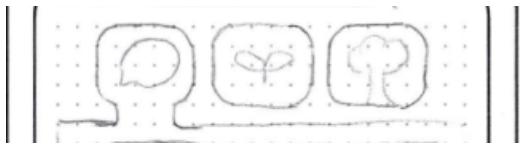


Figure 3



Figure 4

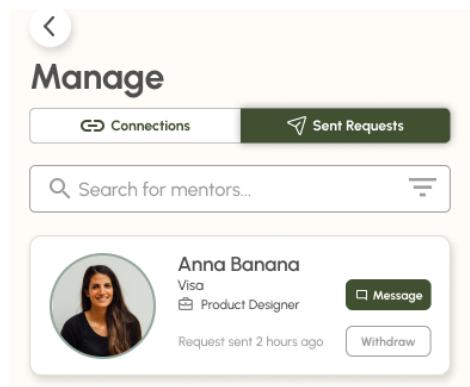


Figure 5

Following the paper-prototype, an additional feature was added to improve the overall user experience of the app. To promote and track the professional growth of users, we introduced an ‘Awards’ feature. When the user interacts and uses the app to connect with mentors, chat with peers, and contribute to forum discussions, different awards are unlocked and points are awarded to the user. Staying consistent to the theme, the points can be used to ‘water’ the plant which symbolizes the user's growth. New users begin as a ‘sprout’, eventually growing into a tree symbolizing the user's growth and journey in their career and personal and professional development . This allows the user to grow individually and track their progress within the app, motivating the user to continue interacting with the app.

## Prototype and Job Story

The prototype which we have created satisfies the Job Story, and we will analyze as follows. Job Story 1 describes the confusion and fear a fellow woman in STEM may face when they are exposed to a male dominated environment. The prototype addresses such intimidation through the mentor page and the forum page depending on the severity and complexity of the confusion. If the user in question is only experiencing a temporary inability or fear to communicate to the male dominated environment, such as a scenario of them having to work in an all male-gendered group, they can use the forum section to ask the women in the STEM community for advice and support on this specific scenario. The forum will thus benefit them by boosting their confidence knowing they are supported by the community, and, as well, through the many users active on this platform, also offers them some short-term action they can take that alleviates such stress. However, such confusion and fear can also be a long term one brought on by the very nature of the STEM industry being male populated. Then, the mentor section will support the user through offering them many mentor options and ultimately letting them find a mentor they work the most comfortable with. As a result, throughout their journey in the STEM industry, the user in question will receive close guidance and support from their mentor who understands the root of their fear and worry, and can thus help them address their fear in a more identifiable and understanding manner.

Job Story 2 addresses the wish of a woman in STEM to be able to freely express their concerns in an environment they identify with during their mentorship experience. This is supported by the mentor and messaging features of the prototype. The mentor page addresses the need for identification and understanding by allowing the user freedom in choosing their own mentors. Although it does offer the user some mentors which it believes best matches the user,

the user still has a final say in whether they wish to reach out to those or find ones with backgrounds they truly identify with. As a result, through the ability to search and filter through all the available mentors, and the mentor pages having images, accolades, descriptions, and backgrounds of the mentor, the mentee user bounds to find one which they identify with the most. Furthermore, the messaging feature allows the user to interact directly with the mentor, allowing for more determinants to whether this mentor is suitable for the user. Although the app does not offer video call or voice call features, if the user and mentor finds themselves a good match, they can work out an environment that is the most comfortable for them, whether it is meeting in person or online, through the message feature.

Job Story 3 identifies the want and need for an individual to have the necessary resources and guidance for their transition to the workforce. This is actively supported by the entire application, as all features of the prototype contribute to this transition and goal. First of all, the mentor page allows for the user to find a mentor who can provide them guidance over a long period of time. Through discussing with the mentor whose career path is one which the user may identify with, or whose background and achievements relates to the user (over message or some other means), the user can establish with the mentor some sort of path or action they can take that will help them transition to the workforce. Additionally, the forum page is also available if the user wishes to be supported by success stories, job related discussions, or by connecting with fellow mentees to network and attend events. Furthermore, there is also the achievement page which allows the user to see their personal growth and be prompted tasks they can do to receive further support (such as: “ask a question on the forum page”, etc.).

Job Story 4 details the wish for the user as an aspiring working woman in STEM to battle imposter syndrome and adapt to the job force. The prototype supports such struggle in a similar

manner as Job Story 3. However, the achievement page is of more accentuation in this scenario. This is because entering the workforce is the end goal of the project and prototype. Thus, assuming the user has been involved in connecting with a mentor, being active in the forum, and networking with others through messages, they will see that on the awards page, they would have many awards, accomplishments, and, most importantly, their sprout would have grown into a tree. Although such awards only reside within the prototype, and have no significance in real life, it is a record of their journey as a woman in STEM, and displays their efforts, determination, and growth, which hopefully aids the user in combating the imposter syndrome and fear at the end of their journey from a student to a working professional and potentially even beyond that to advance in their company or transition to another job.

Lastly, Job Story 5 discusses the wish for not only women in STEM to support each other, but for instructors, recruiting managers, etc. who are male gendered or who may be unaware of such struggles to understand the barriers present for a woman in STEM and consequently contribute to eliminate these obstructions altogether. This is supported by the prototype as the prototype does not eliminate the male gender and others from becoming involved in the initiative. Although the mentor page and the awards page are designed for women in STEM mentees to receive support, those who wish to be involved can always register and be made aware of the barriers and struggles through the forum page. As well, the prototype also has a company profile feature, which allows companies to be involved in this initiative, and receive badges for barrier eliminating behaviors. Nonetheless, the prototype successfully satisfies each of the five job stories.

## Prototype and Functional Requirements

Following the matching of the Job Story, our high fidelity prototype fulfills each of the functional requirements as follows. Functional Requirement 1, being “The system must provide encouragement to women studying in STEM to reduce imposter syndrome and promote confidence in order to better navigate male-dominated workspaces” is successfully addressed by the mentor, forum, and awards page of our prototype. The mentor page provides privatized mentorship guidance for the user by not only matching them to mentors which suits their backgrounds the most, but also letting the user to freely choose and reach out to the mentor they are the most comfortable with. Consequently, with a suitable mentor, the user can receive one-to-one guidance that resolves issues related to the male-dominated workspace, as well gain confidence to better navigate such space being encouraged and supported by someone who is experienced in this matter. The forum page provides the user a large women-in-STEM community which they can freely interact and associate with. Therefore, the user can freely share their worries and struggles to the community, and receive knowledge and support from others who may share similar experiences. Furthermore, the awards page allows the user to observe their achievements and progress, which promotes a sense of accomplishment and thus battles against imposter syndrome.

Functional Requirement 2, being “The system must allow women in STEM education to find other women in STEM education and/or industry who have faced similar barriers”, is most well supported by the forum page. The forum page, being accessible by everyone in the prototype community, allows for those with similar experience to connect to each other through comments and posting features. As well, the user is welcomed to post to the community their wish to find friends who are in the same university, or in the same area. Furthermore, the

messaging feature also allows for the user to privately message other users on the forum, allowing for private discussions whenever necessary.

Third, Functional Requirement 3, being “The system must take a user’s demographic and background into consideration because women need role models who have experienced a similar growth trajectory”, is also fulfilled by the high fidelity prototype through the sign up survey and the mentor matching feature. At the start of the application journey, the user is required to sign up and fill in a survey that consists of various background and demographic related questions. Then, such information is recorded and used to match the user with a mentor that is the most fitting to the user. As well, the prototype also has background and demographic related filters when the user needs to search for mentors. Furthermore, the mentor profiles hold detailed descriptions, backstories, and career trajectory of the mentor which the user can look over and decide if they are a close match. Fourth, Functional Requirement 4, being “The system must encourage collaboration between both males and females to bridge the gender gap in STEM through facilitating collaboration and communication in a safe space”, is best fulfilled by the forum page and the company profiles of the prototype. Although the application is designed with the mind of women-in-STEM empowerment, it does not restrict the use of the app by the male gender. The men who wish to better understand the struggle and barriers faced by the female fellows in STEM can not only observe related posts on the forum, but can also ask questions directed to this women-in-STEM community. Furthermore, male-dominant companies or companies who wish to be more involved in establishing women-friendly work environments can set up company profiles on the prototype and receive badges as they become further involved in the initiative.

Lastly, Functional Requirement 5, being “the system must provide women in STEM with relevant resources about industry recruitment-related information and other available opportunities”, is fulfilled through the forum page and the company profile as well. Having the feature to post with tags on the forum, the relevant recruitment information can thus be filtered through career or opportunity relevancy if needed. With the company profiles, the user can learn more about its opportunities, its women in STEM initiatives, and the percentage of women in working and leading roles in the company. Therefore, the high Fidelity prototype satisfies all the Functional Requirements prompted in A1.

### Two Unique Feedbacks

1. The means to accessing mentors, such as getting to the mentor page from the home page, sending mentor requests, viewing the sent mentor requests, and messaging a mentor is very confusing. It is more intuitive to click on the mentors in the home page to get to the mentors page rather than having to click on the mentor page button at the bottom. As well, viewing and sending requests is confusing as it looks like it could be under messages, but the actual mentor request management is in a different page within the mentors tab. It is a bit frustrating because I cannot find the requests which I have sent in the past, and the viewing requests and mentor messaging could definitely be a bit clearer.
2. Acquiring rewards in the rewards page is a bit confusing because I’m not sure what I should do to acquire my growth. Instead of having to claim the awards, can they just be automatically awarded? Also, there is some trouble learning about the mentor’s current job, as I have to scroll up to click on the current workplace. It would help if the

workplace is linked in the experience section. As well, instead of having the workplace details be viewable through the text, linking it to the icon might be better.

## Evaluation Protocol

Participants for the usability study represent our target users, that is our primary stakeholders who are women students in STEM. Two participants for the study were recruited during open studio sessions and three more participants were recruited based on the team's personal connections.

Each participant was asked to complete a **list of tasks**

1. Sign up on the application: Complete the onboarding and set up your profile.

This includes creating an account by entering the username, email address, password and agreeing to the “Terms of Service and Privacy Policy”, as well as picking a location, their education and experience. (Note that these were pre-filled in the high-fidelity prototype and users could simply click on the desired area to fill)

It also allows users to enter more information like whether they would like to be a mentor or mentee and indicate their career interests. More specifically, participants were asked to be a mentee and are interested in a career in UX Design, Product Design and UX Research.

Then, users could pick a profile picture and fill an open text area to include more information about themselves. (Note that these were pre-filled in the high-fidelity prototype and users could simply click on the desired area to fill)

2. Find a mentor: Find mentors who are product designers located in Toronto.

This includes the participants navigating to the “Mentor” page from the navigation bar and using the filter options to receive a list of mentors.

- a. After finding a list of mentors: Browse the profile of the user “Anna Banana” including their awards and company details.

This includes the participants clicking on “Anna Banana” which brings the user to a preview of the profile and then clicking on “View Full Profile” to see a detailed profile. Participants are then able to click on the company badge or name to view the company profile.

- b. Request a connection: Request to be a mentee to the user “Anna Banana”.

This includes the participant going back to the mentor page and clicking “Request”, and then confirming the request.

- c. View your outgoing requests - specifically the request that was just sent

This includes the participant browsing back to the “Mentor” page and going to the “Manage” button and going to “Sent Requests”.

3. Create a new message to a mentor who has accepted your request: Send a message to “Anna Banana”.

This includes the participant navigating to the “Message” page from the navigation bar, clicking on the “new message” icon, picking “Anna Banana” as the receiver and sending a pre-filled message.

4. Explore the forum and make a post

This includes the participant navigating to the “Forum” page from the navigation bar and clicking on the “new post” icon. They are able to enter a title and the text of the post.

(Note that these were pre-filled in the high-fidelity prototype and users could simply click on the desired area to fill)

Participants are also asked to tag their post with “Career Advice” and “Question”.

## 5. Discover your growth progress and awards

This includes the participant navigating to the “Awards” page from the navigation bar.

### a. Redeem your rewards points

This includes the participant clicking on the water icon beside “Sowing Seed” to grow their sprout.

## 6. View your own profile

This includes the participant clicking on the profile icon on the “Awards” page.

Data collection methods used:

### 1. **System Usability Scale (SUS)**

Category: Quantitative Subjective

Rationale: A System Usability Scale (SUS) is used to evaluate the usability of our app dedicated to connecting women in STEM with mentors. This method was chosen to offer a quantitative subjective evaluation, and SUS is a widely used and validated tool for measuring the overall user experience and satisfaction with a system or product.

The SUS questions in **Table 1** below captures data on users' perceptions of the app's effectiveness, efficiency, and user satisfaction. Our SUS survey consists of 10 statements related to usability, and users rate their agreement with each statement on a 5-point Likert scale. The scores from each statement are then aggregated to give an overall score as shown in **Figure 6 and Table 3** below, which can be compared to industry benchmarks and used to identify areas for improvement. In addition to measuring usability, SUS data

collection method also captures data that speaks to the degree to which the design satisfies the goals, needs, and wants of the target audience. This is because the survey asks questions that are relevant to the user's experience and satisfaction with the app, such as how confident they feel using the app, how likely they are to recommend it to others, and how well it meets their needs. By collecting this data, the app's design team can gain insights into what users like and dislike about the app, and use this information to make informed decisions about future design iterations.

**Table 1: SUS Questions and Rationale**

| Questions  | Rationale   |
|--|---|
| 1. I felt that the app encourages communication between mentors and mentees.                         | The question provides insights into the effectiveness of the app in facilitating communication between mentors and mentees, which is a critical aspect of the mentor-mentee relationship. Feedback is helpful for informing the app's design to reinforce the features that are working well and potentially build on them to further enhance user experience.  |
| 2. I found that the app does not provide any valuable resources for women in STEM beyond mentorship. | The question is important for assessing the app's ability to meet the needs of its target audience effectively. Women in STEM often face unique challenges, including discrimination, lack of representation, and insufficient support. The app's ability to provide valuable resources beyond mentorship would indicate that it is addressing these challenges from a diversity of perspectives and offering a comprehensive |

|  |   |
|--|---|
|  | <p>solution to support women in STEM. If the app does not provide valuable resources beyond mentorship, it could be an indication that the developers did not consider the specific needs of women in STEM. In this case, the question can prompt the developers to consider adding more resources to the app to make it more useful and relevant to its audience.</p>  |
| 3. The app makes it easy for me to track progress and goals in the mentorship. | <p>Progress tracking is an essential aspect of achieving goals as it provides clarity, motivation, and accountability to stay on track towards achieving one's objectives. If users find it easy to use this feature, it suggests that the app is designed effectively. Progress tracking is essential for achieving goals because it provides a clear picture of where an individual stands in relation to their objectives. Progress tracking encourages users to keep using our app as it helps them to stay motivated and focused on their objectives. When people can see tangible evidence of their progress, it can give them a sense of accomplishment and encourage them to keep working towards their goals. Celebrating small successes and milestones can provide a boost of confidence and motivation to keep going, especially when working towards long-term goals. On the other hand, if users find it difficult to track progress and goals, it could indicate that the app's interface is</p> |

|   |  |
|---|--|
|   | not intuitive or that the feature is not useful. In this case, we can use the feedback to improve the app's interface and features to enhance the user experience.   |
| 4. I found the features in the app confusing to navigate.                         | The question is important for evaluating the efficiency and effectiveness by determining whether the user is able to navigate the app and find the features they need easily. If users find the features confusing to navigate, it can suggest that the app's interface is not intuitive or user-friendly, which can negatively impact the user experience and satisfaction. If users find the features confusing, it can suggest that the app's layout, design, or navigation needs improvement. This is critical for us to identify because confusion could lead to frustration and discouragement, causing users to abandon the app altogether. Therefore, it is crucial to address any confusion and difficulty in navigating the app to ensure that users can access all the app's features and derive value from them. |
| 5. The app met my expectations in terms of providing resources for women in STEM. | The question assesses whether the app is satisfactory to users and effective in addressing their needs. As a next step, we could use follow-up interviews to identify what features and resources are most useful and prioritize those instead, as well as what features were missing that the target audience needs.  |

|  |  |
|--|--|
| 6. It was time-consuming for me to search for mentors using the app.   | <p>The question assesses the efficiency in the mentor search process using the app and if the search feature needs improvement. If it takes too much time or effort to find a suitable mentor, this would become another barrier for women to find the resources and support that they need. Users may also become frustrated and lose interest in using the app.</p>  |
| 7. I am confident that the app would be able to effectively help me find a mentor who can provide valuable guidance and support. | <p>If users are confident that the app can effectively help them find a mentor, it suggests that the app is fulfilling its purpose and providing value to its users, which can increase their engagement and motivation to use the app. Users are more likely to use an app that they trust to deliver value and help them achieve their goals. If users lack confidence in the app's ability to help them find a mentor, it may indicate that the app's mentorship functionality needs improvement.</p>       |
| 8. I am not satisfied with the overall design and layout of the app.   | <p>Design and layout are critical aspects of an app's usability, as they can impact the user's ability to navigate the app and access its features effectively. If users find the design and layout confusing, cluttered, or overwhelming, they may struggle to use the app. This can lead to frustration and a negative user experience, and impact their perception of the app's quality and value. Users may be less likely to engage with the app, and it can impact their satisfaction and retention.</p> |

|  |  |
|--|--|
| 9. I would recommend the app to a fellow woman in STEM seeking mentorship. | <p>The willingness to recommend is a critical metric for assessing the app's overall effectiveness and user satisfaction. If users are willing to recommend the app to others, it indicates that users have confidence in the app's ability to deliver value and help others achieve their goals, which can impact the app's growth and adoption rate. Positive recommendations can lead to more users, increased engagement, and a higher retention rate.</p>   |
| 10. I would need the support of a technical person to use this system.     | <p>The question assesses the user's ability to use the app independently. If users require technical support to use the app, it suggests that the app's interface may not be user-friendly or intuitive, which can lead to frustration, delays, and a negative user experience. Thinking into the future, if users require technical support, it can impact the app's scalability and maintenance. It can require more resources and time to provide technical support, which can impact the app's cost-effectiveness and profitability.</p> |

Overall score (out of 100) =

$$2.5 * \left[ \sum_{\text{odd Q's}} (q_i - 1) + \sum_{\text{even Q's}} (5 - q_i) \right]$$

**Figure 6. SUS Evaluation Formula**

Overall, the use of SUS data collection method is crucial for evaluating the usability and

overall satisfaction of an app dedicated to connecting women in STEM with mentors. By collecting quantitative subjective data, the design team can ensure that the app is user-friendly, meets the needs and goals of the target audience, and provides a satisfying user experience.

## **2. Recorded observations of navigation patterns:**

Category: Qualitative Objective

Rationale: Recording observations of navigation patterns for the various tasks presented to the user will help the team uncover any usability issues within the prototype. For instance, if we observe that when participants are asked to do a certain task, they repeatedly click the wrong buttons or go to the wrong pages, this indicates that the prototype is confusing. It might mean that the icons are obscure or that the flow to complete a certain task in the prototype is not clear.

Moreover, the navigation patterns can be used to support the quantitative objective data that is collected as part of the usability study. For instance, if the user clicks on a certain number of wrong buttons before finding the right one when performing a task, observing the navigation pattern can help the team understand what might be confusing or where users are struggling. With this information, the team can make appropriate changes to the prototype.

## **3. Open-ended survey responses that also include participant feedback.**

Category: Qualitative Subjective

Rationale: A questionnaire was administered after the user interacted with the high-fidelity prototype. This questionnaire collects data regarding the efficiency and the satisfaction that participants felt while using the prototype. The open-ended questions

provide the users with an opportunity to describe their experience and perception in more detail. This helps the team gain an in-depth understanding of the user experience and helps us identify potential issues with the prototype.

More specifically, open-ended questions help us identify unanticipated issues which was not considered by the team, and which cannot be spotted using closed-ended questions.

We do so by using questions such as this: “Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?”.

We also use the open-ended questions to ask for improvement suggestions with questions such as “Were there any features that were missing or could be improved to make the application more efficient?”. This helps us gain a better understanding of the user’s needs and expectations. We also use the open-ended questions to understand the likes and dislikes of our users with questions such as “Were there any features or functionalities that you particularly liked or disliked about the application? Why?”. This helps us understand the satisfaction that the user felt while using the app and will help inform improvements in our prototype.

#### **4. Number of clicks to complete task:**

Category: Quantitative Objective

Rationale: Our prototype has many points of interaction, usually nested within each other. Therefore, while it is clear to us, the developers, where each flow starts and ends, and what different features there are, this would not be obvious to users. By counting the number of clicks it takes to complete a task, we can understand which tasks were not as efficient as the others. Moreover, for our prototype, we believe that the number of clicks

is correlated with the time spent on each task and would be on its own descriptive enough to describe efficiency, so we did not count time duration for each task. We can compare the average number of clicks that it takes to complete a task with the optimal number of clicks, determined by us, to determine the efficiency. We divide the average number of clicks by the optimal number of clicks to get a scalar value (%) of how they compare. When combining this metric with the success rate of each task, as will be mentioned in the next point, the numbers become more useful in understanding if there were sub-optimal implementations of features that lacked efficiency.

## 5. Success Rate of Tasks:

Category: Quantitative Objective

Rationale: The success rate of tasks is measured using our predetermined definition of what ‘success’ is. We defined success as the ability to finish a task flow as we, the researchers, expected, from end to end. For example, if a user was asked to view the message requests that they had sent but instead navigated to the requests that the user received (instead of sent) and stopped, then we would count this as a failure, since the flow we had expected was not achieved. Additionally, if the user missed on some of the sub-tasks, such as not claiming rewards when asked to explore and interact with their awards and growth, this would be counted as a failure as well. In the end, it is calculated by counting the number of users who had successfully completed the task divided by the total number of users. This metric will help us determine how effective our implementation of the different features are, and if there are any non-intuitive pathways that are imposed on the user to follow.

## Evaluation materials employed:

### **User tasks**

A list of tasks was prepared before the usability testing. During the study, participants were asked to complete the list of tasks, as was described above.

### **Video or audio recordings**

Participants were asked to complete the testing on an iPhone or laptop. The screen was recorded and the touch sense was activated, meaning that whenever the participants would touch the screen, it would be flagged with a touch icon. An overhead recording of the session was also done, which shows the participant interacting with the prototype on the iPhone or laptop. This recording includes visuals, as well as audio. The recordings were then analyzed asynchronously for the quantitative objective measures mentioned in the previous section.

### **Think-aloud protocols**

Participants were asked to describe their thoughts aloud as they were completing a task. This would be recorded as part of the video recording.

### **User questionnaires/surveys (includes demographic and background information)**

Two questionnaires were administered after the user interacted with the high-fidelity prototype. The first questionnaire is a system usability scale (SUS) questionnaire that attempts to collect quantitative objective data. This questionnaire also includes questions regarding the demographic and background information of the participant. This includes questions such as age group, highest level of education and whether they are currently working or studying in the STEM (science, technology, engineering, mathematics) field.

The second questionnaire is an open-ended survey that attempts to collect qualitative subjective data on the efficiency and satisfaction of participants.

## Study Results

### Summary of demographic information of the participants:

All of the participants in the usability study are women in STEM. Four of our participants are between the ages of 18 and 24 and one participant is between the ages of 25 and 34. Two participants are currently studying in a STEM field, another currently working in a STEM field and two currently doing both. Two of the participants have completed high school, one has completed a college or CEGEP certificate or diploma, one has completed a bachelor's degree and one has completed a professional degree (e.g. Medicine, Law, Pharmacy, Dentistry). They specialize in different fields such as pharmacy, statistics, astronomy, computer science major, mathematics minor and user experience design. Three of our participants also identify as a racialized person or person of colour. Three of the participants describe themselves as East Asian (e.g Chinese, Japanese, Korean), two describe themselves as white and one describe themselves as Southeast Asian (e.g. Vietnamese, Cambodian, Thai). None of the participants identified themselves as a person with a disability.

### Key findings:

#### **1. From quantitative objective data collected:**

**Table 2: Measures of the number of clicks and success rate**

| Task | Optimal Clicks | Avg. Clicks | <i>Efficiency:</i> Clicks by each user<br>(User1, User2, User3, User4, User5) | <i>Effectiveness:</i> Task success |
|------|----------------|-------------|---|------------------------------------|
|      |                |             |   |                                    |

|                   |   |    |      |                    |      |
|-------------------|---|----|------|--------------------|------|
| Onboarding        | Please complete the onboarding and set up your profile  | 16 | 16.2 | 17, 16, 16, 16, 16 | 100% |
| Mentor Connection | You are interested in connecting with a mentor. Please find a mentor that is a product designer and located in Toronto.         | 7  | 6.4  | 16, 3, 7, 3, 3,    | 20%  |
|                   | Browse their full profile, including their awards and company.  | 4  | 3.2  | 4, 2, 5, 3, 2      | 40%  |
|                   | Request a connection to Anna Banana   | 2  | 2    | 2, 2, 2, 2, 2      | 100% |
|                   | View the request that you had just sent   | 4  | 7.2  | 7, 5, 6, 16, 2     | 60%  |
| Messaging         | Navigate and create a new message to anna   | 5  | 15   | 23, 27, 5, 5       | 75%  |
| Forum             | Explore the forum and make a post. The post will be about career advice and question, so tag your post appropriately, and post. | 8  | 8.4  | 8, 8, 8, 8, 10     | 100% |
| Awards            | Discover your growth progress and awards on the app and view your own profile   | 4  | 4.6  | 6, 3, 3, 5 , 6     | 20%  |

#### a. Missed Sub-Features/Tasks Led to Low Success Rate

While there were many tasks that were effective, with a success rate of 100% by users (onboarding, sending a request, exploring the forum), there were a few that were not as effective. Noticeably, when connecting with a mentor or exploring awards, only  $\frac{1}{5}$  of the participants for each task fully explored the features of each task, as asked. Most of the

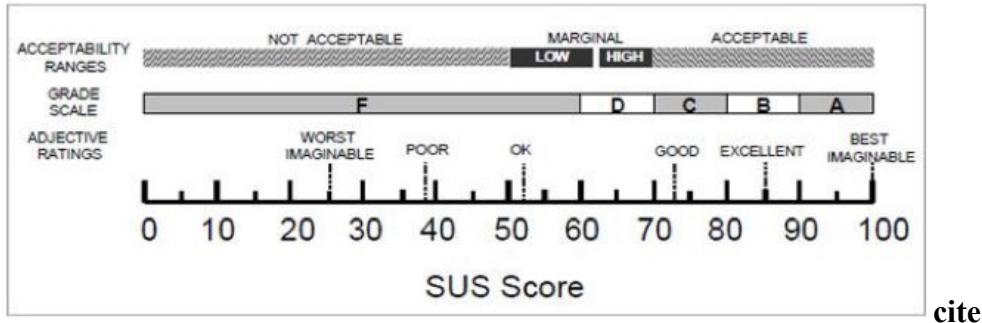
time, different sub-tasks and features were either missed or an alternative pathway was found that satisfied their current task. For example, mentors that were product designers and located in Toronto were often not found using the filter, but rather by clicking a mentor profile in the main page, and [retroactively noticing that the mentor fit the criteria](#) - in fact, this happened 80% of the time. This showed that some paths or functionality we had included for the purposes of accessibility were used as the main navigation because of its perceived efficiency, unlike our intentions.

**b. Large Number of Clicks indicated Low Efficiency for Select Tasks**

There are two other features that, while they had a high success rate, required a much larger number of clicks to accomplish. For example, while the task of sending a message to the mentor had a 75% success, the number of clicks it took for users to get there was 200% **more** than the optimal number of clicks. Another example is viewing the request after requesting a mentor, which has a moderate 60% success rate but was achieved using 180% of the optimal number of clicks, as can be seen in this [example](#). Therefore, it is important to consider the number of clicks and the user success together for each task, as the features that required more clicks were also places of improvement to increase the efficiency of our prototype. By targeting these tasks, we can elevate the user experience.

**2. System Usability Scale (SUS) Questionnaire Results (Quantitative Subjective)**

SUS scores from each participant was calculated using the formula shown previously in **Figure 6**. Averaging participant scores, an overall score of 87.5 suggests that the usability of the app is generally good, but there is still room for improvement. Using **Figure 7**, the SUS scores are interpreted with scores above 73 being good and scores above 85 are considered excellent.



**Figure 7. Interpreting SUS Scores**

From **Appendix A1, Table 3**, was produced using Figure 6 to generate the overall scores and **Figure 7** to interpret the scores. Participants 2 and 3 gave scores of 95, indicating that they found the app very easy to use and were satisfied with their experience. Participant 1 gave a score of 82.5, which is still considered above average, indicating that they found the app relatively easy to use but may have encountered some issues. Participant 5 gave a score of 90, indicating that they found the app quite easy to use and were mostly satisfied with their experience. However, Participant 4 gave a score of 75, which is below average and suggests that they found the app somewhat difficult to use and were dissatisfied with their experience. Overall, the results suggest that the app has good usability, but there may be some areas for improvement to enhance the user experience further. It would be helpful to obtain additional feedback from the participants by conducting a follow-up interview to better understand the rationale behind their scores to identify specific areas for improvement and make necessary adjustments to the app. The next section on Open-Ended Survey results provides a more detailed view into the rationale behind the participant scores, as the questions prompt users to elaborate on their answers to the SUS questions.

**Table 4: SUS Evaluation Scores with Interpretations**

| Participant | Overall Score<br>(Out of 100) | Acceptability<br>Ranges | Grade Scale | Adjective Ratings |
|-------------|-------------------------------|-------------------------|-------------|-------------------|
|-------------|-------------------------------|-------------------------|-------------|-------------------|

|   |      |            |   |                |
|---|------|------------|---|----------------|
| 1 | 82.5 | Acceptable | B | Good-Excellent |
| 2 | 95   | Acceptable | A | Excellent      |
| 3 | 95   | Acceptable | A | Excellent      |
| 4 | 75   | Acceptable | C | Good           |
| 5 | 90   | Acceptable | A | Excellent      |

### 3. From open-ended survey (qualitative subjective data efficiency and satisfaction)

#### Perceived efficiency:

- Two out of five of the participants mentioned that the list of mentors or the recommended mentor list on the home page made the application efficient to use.
- In comparison to other similar applications that they have used, four of the participants found this platform to be efficient or straightforward to use.
- Three out of five of the participants mentioned that finding the mentor sent request button was difficult or confusing. Two of the participants mention that this task was frustrating and suggest that this be done in a smoother manner to better the efficiency of the platform.

#### Perceived satisfaction:

- All five of the participants mention being very satisfied with the overall design and layout of the application. For example: “The design was aesthetically pleasing and simple! I found it really easy to navigate around the app.”
- All five of the participants mention that the application met their expectations, that is in trying to find a mentor to match with, as well as using other features. (such as the forum)

- All five of the participants would consider using this platform again in the future, as well as recommending it to their others to help with their career development.
- When prompted with the question: “Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?”, three participants mentioned the difficulty with finding the mentor sent request button.

*Please note that the key findings already go in detail regarding what went well and what did not go well. Below is a summary/main takeaways.*

What worked well during the evaluation:

**1. Successful onboarding, sending a request to the mentor and exploring the forum and making a post.**

For each of these tasks, the task successfully completed rate is 100%. This means that all five participants finished these tasks as we expected, and had detailed from end to end. We also see that these tasks have an average click close to the optimal number of clicks. More specifically, the successful onboarding has an average number of click of 16.2, with an optimal number of click of 16, the “sending a request to the mentor” task has an average number of click of 2, with an optimal number of click of 2 and the “exploring the forum” task has an average number of click of 8.4, with an optimal number of click of 8. This demonstrates that the flow of the platform for these tasks is easy to understand and is efficient. This is supported by the quantitative subjective data collected where participants mention that in comparison to other similar applications,

four of the five participants mention that the platform is efficient and straightforward to use.

## **2. Ease of use and overall satisfaction with the platform**

From the quantitative objective data as well as qualitative objective and subjective data, we find that the platform is easy to use for the most part. There are aspects of the platform that were not as straightforward and are covered in the next section.

As was detailed above in the key findings from the SUS evaluation, the results overall suggest that the app has good usability, but there may be some areas for improvement to enhance the user experience further. Three out of five of the participants have an overall score of 90 and above, one of 82.5 and one of 75.

The quantitative subjective data also support the overall satisfaction with the application as all five of the participants mention that the application met their expectations, that is in trying to find a mentor to match with, as well as using other features. Moreover, all five of the participants would consider using this platform again in the future, as well as recommending it to their others to help with their career development.

### What did not work well during the evaluation:

#### **1. Task 2c: View your outgoing requests - specifically the request that was just sent to “Anna Banana”**

From the quantitative objective data collected for this task, the task successfully completed rate is 60%. The average number of clicks is 7.2 with the optimal number of clicks being 4. We should note that one of the participants had a number of clicks equal to 16.

Although this number seems quite reasonable, when we analyze the qualitative subjective data, most of the participants complained about this task. More specifically, three out of five of the participants mentioned that finding the mentor sent request button was difficult or confusing and two of the participants mention that this task was frustrating and suggest that this be done in a smoother manner to better the efficiency of the platform.

In this short video clip [here](#), we can visibly see the confusion surrounding this task. The participant browses to the “Message” page and clicks on “requests”. When prompted again to view the connection request that was just sent for mentorship, the participant then browses back to the “Home” page and presses on the correct icon on the top right to go to the sent requests page to find the sent requests. The same confusion can be seen in this [example](#). This suggests that the flow for this feature is not easy to understand and therefore not efficient.

## **2. Task 3: Navigate and create a new message to Anna Banana**

From the quantitative objective data collected for this task, the task successfully completed rate is 75%. The average number of clicks is 15 with the optimal number of clicks being 5. We should note that two of the participants had a total number of clicks equal to 23 and 27 respectively while two had a total number of clicks equal to 5 each. The big difference in the number of clicks between the participants suggests confusion and inefficiency of the platform. The platform may have been easy to understand for some, while not for others.

In fact, from the qualitative subjective data collected, one participant mentions “I wasn't sure how to view my sent requests, or how to message a mentor” when asked about tasks that they found challenging or time-consuming. Moreover, a participant mentions “i think the viewing

requests and mentor messaging could be a bit clearer, but maybe that's just me!" when asked whether there is anything about the application that they found particularly frustrating.

### **3. Task 5, 6: Discover your growth progress and awards on the app and view your own profile**

From the quantitative objective data collected for this task, the task successfully completed rate is 20%. The average number of clicks is 4.6 with the optimal number of clicks being 4. The 20% task successfully completed rate shows that only one out of five participants fully explored the features of each task, as asked.

From the quantitative subjective data, a participant mentions "And, acquiring my growth (?) was a little confusing as well." when asked about specific tasks particularly challenging or time-consuming. Moreover, a participant suggests "Instead of having to "claim" awards, can they just be automatically rewarded?" when asked whether there is anything about the application that they found particularly frustrating and what improvements they would suggest making to the application to make it more efficient. This all suggests that this task was not as efficient and effective as needed.

We should also note that the recording of the participant for this task displays the frustration behind this task. Although the participants were not actively clicking on buttons (which would have been recorded in the quantitative objective data), we observe the confusion surrounding this task [here](#).

## **Design Implications and Lessons Learned**

### Importance of Instructions

During the testing process, we followed a script with all of the instructions to give to the user. We noticed that by changing certain verbs up or how instructions are delivered, it impacted how participants approached the task. In addition, when we gave task instructions all at once, participants would often forget and ask us to repeat the task. Following this instance, we ended up delivering the tasks granularly and after the participant reached a certain checkpoint of a task.

### Information Overload On First Encounter

One of the tasks with the lowest success rate was Mentor Connection. We observed that participants would tap around the app in an attempt to figure out the information architecture and fulfill the task. We believe that because it was their first exposure to the app, users became overwhelmed with the amount of information needed to digest. In addition, because the Mentor page was connected to other task flows, users easily diverted from the task and ended up completing alternative task flows that were irrelevant.

### Understanding Unconventional Flows

Our other task that had the lowest success rate was Redeeming Awards. This is an unconventional task that is unique to our system. Therefore, a lot of users were unfamiliar with what to do when given the task. Although we did provide a text box to prompt the user and describe how to redeem their points, many did not read it. Therefore, perhaps additional measures to ensure that users understand the task is in order.

## List of Changes

### *Message/mentor Request Flow*

- Add notification button to home screen (Figure 8).
- Instead of having separate pages for ‘Mentor Requests and Connections’ and ‘Message Requests’, we combined them together with a notification bell button to indicate new requests. This is more aligned to users’ mental model of existing application flows (Figure 9).

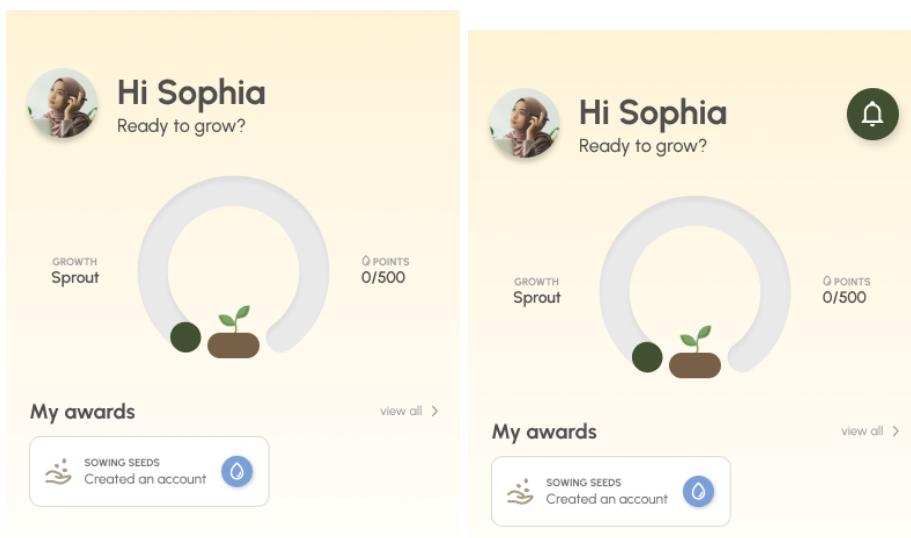


Figure 8. Before and after of new notification button

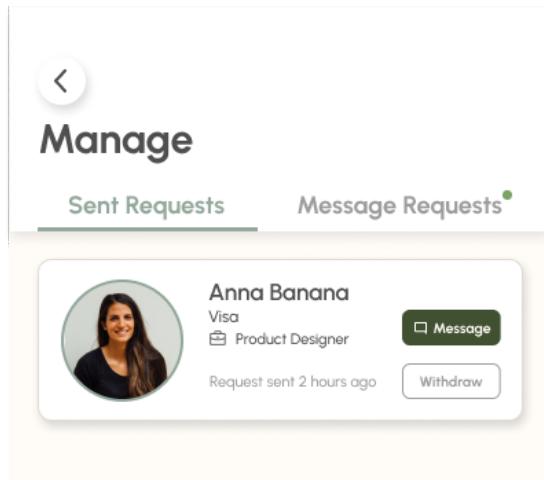


Figure 9.

### *Swipe Mentor View*

- This function to view different mentors was evidently a pain-point found in usability testing, for the next iteration of the design, this function will be taken out and a back button implemented for users to navigate to the list view of mentors.

### *Make Plant Growth Clickable to Page*

- To highlight the ‘Awards’ function of the app, making the plant icon on the homepage functional will allow the user to navigate directly to the ‘Awards’ page to easily access their progress.

### *Make Icons More Distinctly Clickable*

- There were certain buttons that did not appear clickable to the user. We can add shadows to further emphasize that it is an interactive component (Figure 10).



Figure 10.

### *Add Additional Shortcut Buttons*

- On the mentor profile page, participants tried to navigate to their company profile by clicking on the logo of the image. However, it was not connected to the company profile frame so they were unsuccessful. We will connect the logo to the company profile (Figure 11).

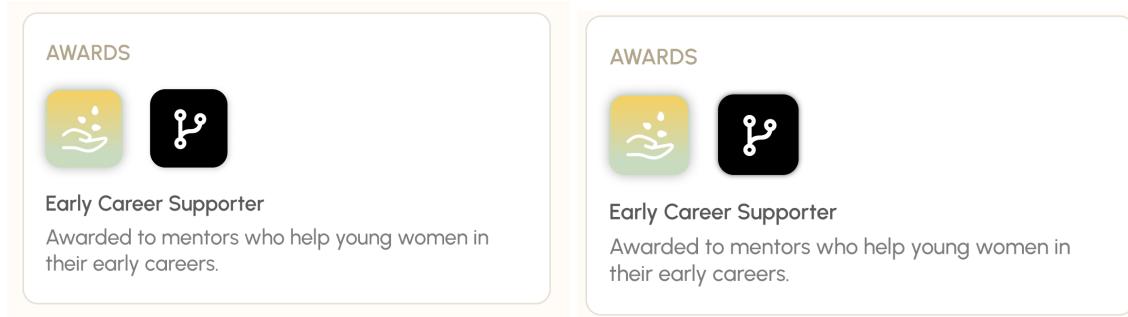


Figure 11. Before and after of adding a shadow

## Reflection

### Quantitative Objective Measures

If given more time, we would have preferred being able to tag or label the different types of errors made throughout the testing to get a better sense of what specific type of error was being caused. For example, some of the tasks users had made errors because there was an extra step that the user didn't take, whereas other tasks failed because users navigated to a completely different path from the optimal one. These different errors are vastly different and would need to be addressed differently as well. It is for this reason that we didn't include an 'overall' error count because it would not help us interpret what went wrong. Instead, we did the flip side, where we counted the number of successes for each task, as there is only one situation in which a user would complete a task successfully. If the error rate was categorized into different types of errors, then this would perhaps help more in identifying issues with our prototype.

### Hawthorne Effect

When doing the testing, we did not try to hide the fact that participants were being recorded or observed. As a result, participants could be acting differently than normal due to the pressure of being watched. This is also known as the Hawthorne effect. If given the resources, we would have liked to make it less intimidating for the participant and used a one way mirror room to test them. This could ease the tension for them and perhaps provide more reliable results.

### Further Testing & Iteration

If given additional time, we would like to thoroughly iterate upon our prototype based on the insights from the usability testing and do another evaluation. The testing conducted was extremely valuable as it allowed us to see how our target demographic would interact with a prototype similar to our final product. Although we will be making changes to our prototype before the presentation, we will be unable to make all changes due to the short turnaround time. In addition, it would be useful to go through another round of testing in order to see if there are any other usability issues not found previously.

### Building Out Mentor Flow

Due to the limited time frame given, we chose to primarily focus on the mentee's flow when designing our app. This allowed us to really flush out the functionalities that would address the pain points of our goal demographic. However, our next steps would be to build the Mentors' perspective of the app. We would like to conduct additional research to understand the mentor

experience and what their current pain points are with mentoring. After, we would design the flow and UI, using this research to educate our decisions. Overall, we believe this will allow us to create a complete app that is functional on both ends.

## Contribution Table

| Member | Task  | Estimated Time (hr) |
|--------|---|---------------------|
| Chyna  | A3 Presentation   | 1                   |
|        | High-fidelity Prototype   | 20                  |
|        | Usability testing (recording)   | 2                   |
|        | Writing (high-fidelity explanation, design changes, proof-reading)            | 3                   |
|        | Prototype iteration   | 1                   |
| Cindy  | A3 Presentation   | 1                   |
|        | Hi-fi prototype   | 20                  |
|        | Usability testing   | 2                   |
|        | Writing (design implications, reflection, proof-reading)                      | 2.5                 |
|        | High Fidelity Usability Testing   | 2                   |
| Lucy   | Quantitative Subjective Data Collection/Analysis                              | 4                   |
|        | Write up for Quantitative Subjective Data Protocol and Results + proofreading | 4                   |
|        | A3 Presentation   | 1                   |
| Maggie | High Fidelity Usability Testing   | 2                   |
|        | Quantitative Objective Data Collection/Analysis                               | 2                   |
|        | Write up for Quantitative Objective Data and Report                           | 3                   |

|         |   |        |
|---------|---|--------|
| Tina    | Presentation  | 1 hr   |
|         | Figma Prototype   | 11 hrs |
|         | Interview, recording  | 1 hr   |
|         | High-Fidelity Write up + 2 Feedbacks  | 3 hrs  |
|         | Functional Req Write up   | 2 hrs  |
|         | Proofreading + Formatting   | 2 hrs  |
| Umayrah | A3 Presentation   | 1      |
|         | Usability testing   | 1      |
|         | Evaluation Protocol - task list, evaluation materials and data collection method rationale for open-ended questionnaire | 2      |
|         | Study Results - demographics and key findings for open-ended questionnaire, what worked/did not work during evaluation  | 3      |
|         | Proofreading  | 1      |

## Appendix

### A1: SUS Questionnaire Responses (Raw Data)



## CSC318: Usability Questionnaire for Mentorship App Prototype

This survey seeks to evaluate the usability of our high-fidelity prototype of an app that aims to better support women-identifying students in STEM education to help them identify the resources they need to navigate their careers within an inclusive environment. We hope to encourage female success in STEM fields and related disciplines. Your opinion is very important to help us identify the measures to make STEM careers more accessible for women. Your responses will be recorded **anonymously**.

**Please sign this consent form prior to participating in the survey: [LINK]**

Without your consent form, your responses will be excluded from our usability study.

The survey results will be analyzed by a team of students at the University of Toronto as part of a course (CSC318H1: The Design of Interactive Computational Media). If you are interested in the results, please indicate it and leave your email address.

Thank you for taking the time to participate in our survey!

### FAQs

#### **Do I have to answer all the questions?**

No. The questions are voluntary and you can choose 'prefer not to answer' to any or all questions.

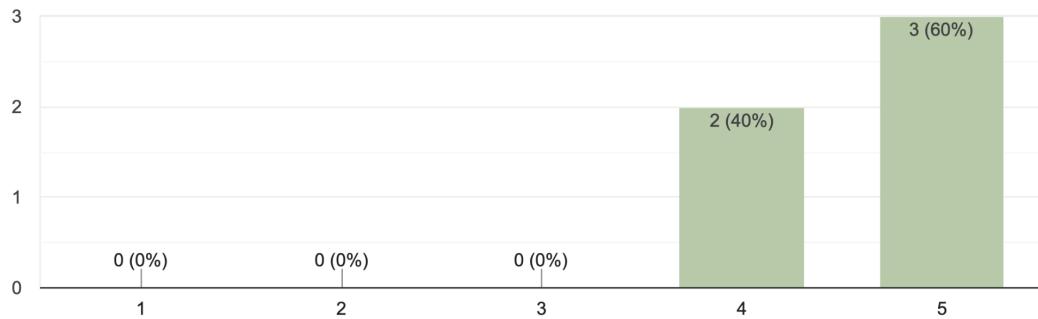
#### **Who will see this information?**

This information will be visible only to our team and course facilitators (ex. professors, TAs). When used to inform our project design, the information will be combined with data from all other survey participants and no one will be able to identify any of the participants.

If you have any other questions please feel free to reach out at [lucyma529@gmail.com](mailto:lucyma529@gmail.com)

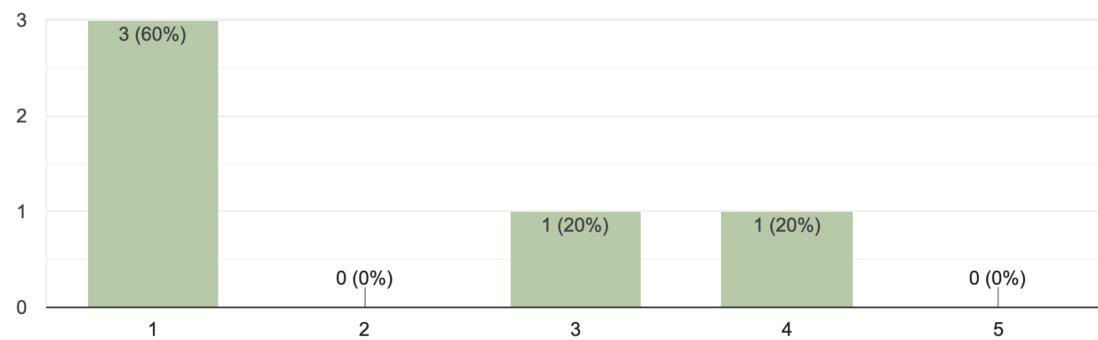
**1. I felt that the app encourages communication between mentors and mentees.**

5 responses



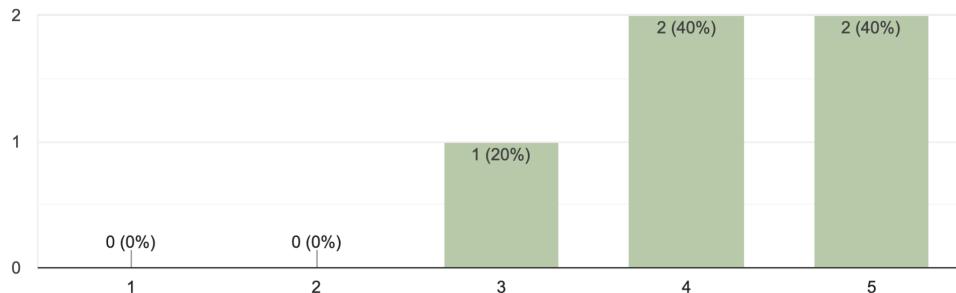
**2. I found that the app does not provide any valuable resources for women in STEM beyond mentorship.**

5 responses



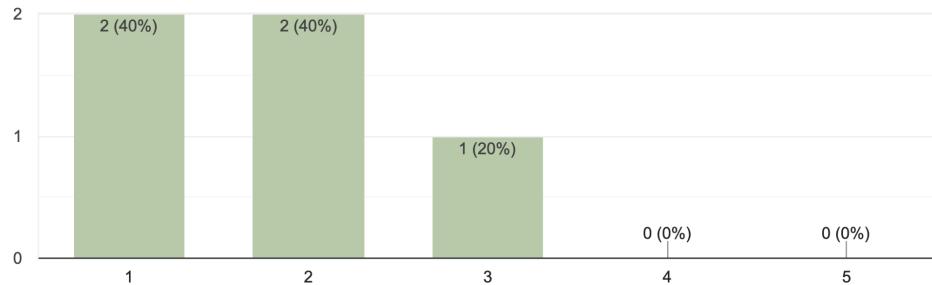
**3. The app makes it easy for me to track progress and goals in the mentorship.**

5 responses



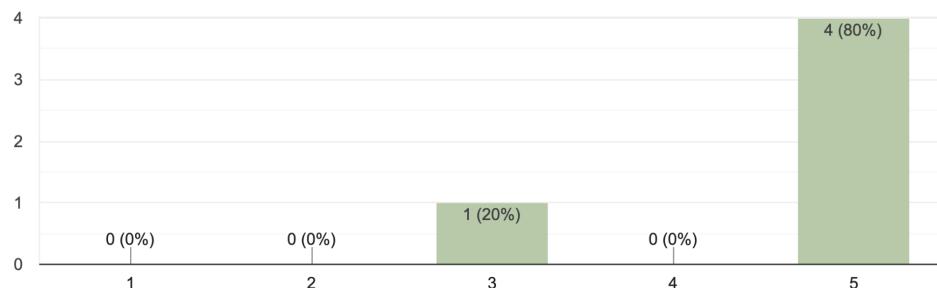
4. I found the features in the app confusing to navigate.

5 responses



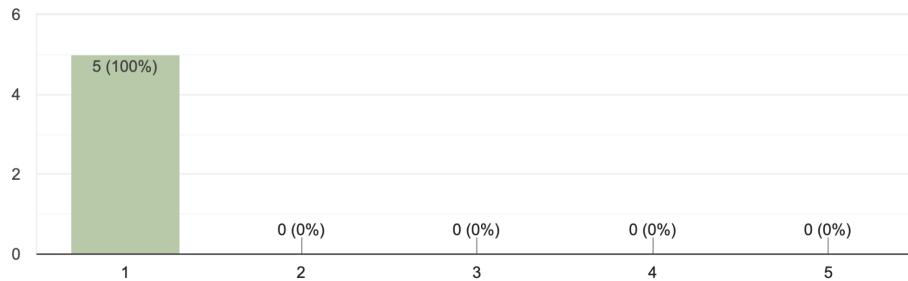
5. The app met my expectations in terms of providing resources for women in STEM.

5 responses



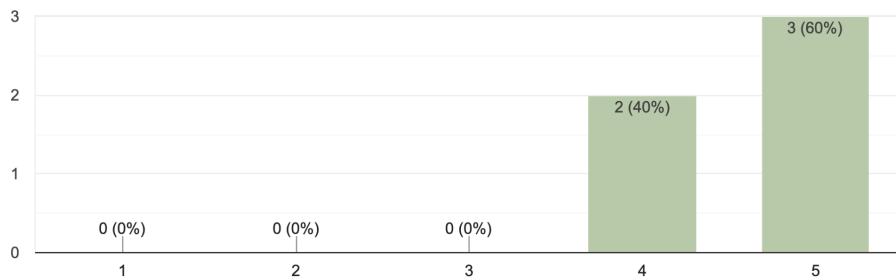
**6. It was time-consuming for me to search for mentors using the app.**

5 responses



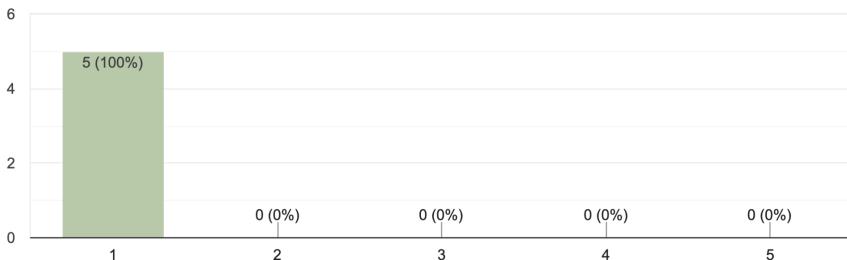
**7. I am confident that the app would be able to effectively help me find a mentor who can provide valuable guidance and support.**

5 responses



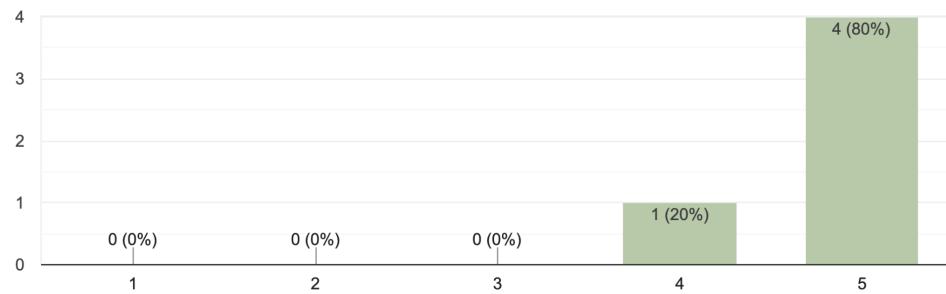
**8. I am not satisfied with the overall design and layout of the app.**

5 responses



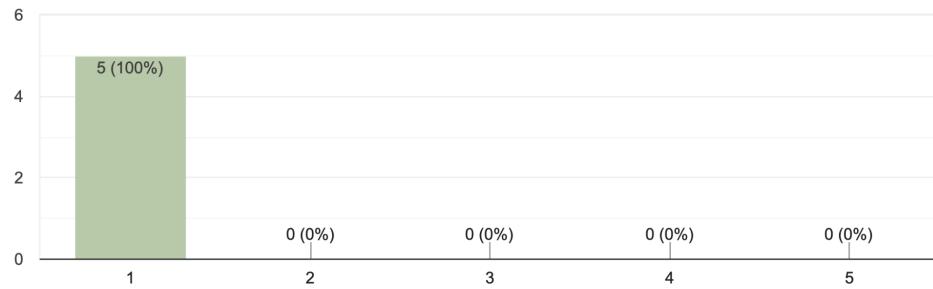
**9. I would recommend the app to a fellow woman in STEM seeking mentorship.**

5 responses



**10. I would need the support of a technical person to use this system.**

5 responses

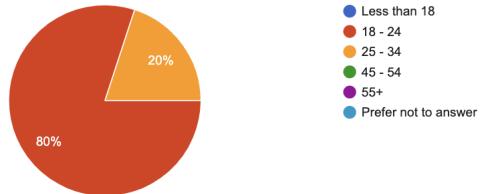


## Inclusive Demographic Data Collection

Please indicate which of the following best describes your age group.

Copy

5 responses



Please indicate which of the following terms best describes your gender identity.

Copy

5 responses



Do you identify as a person with a disability?

Copy

*Persons with disabilities include those who may experience barriers to full participation in University life as a result of long-term, temporary, or episodic physical, mental/emotional, sensory, or learning disabilities, including those caused by chronic health conditions. It should also be noted that the social model of disability recognizes that disability is not created by any medical or physical condition, but rather by societal barriers. A disability may be evident or non-evident.*

5 responses

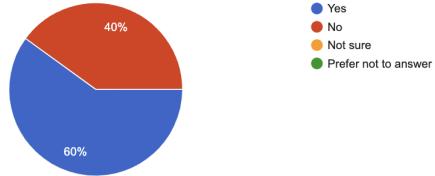


Do you identify as a racialized person/person of colour?

Copy

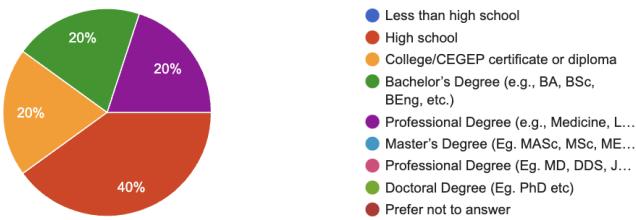
*The Ontario Human Rights Commission defines racialization as a process by which societies construct races as real, different and unequal in ways that matter and affect economic, political and social life.*

5 responses



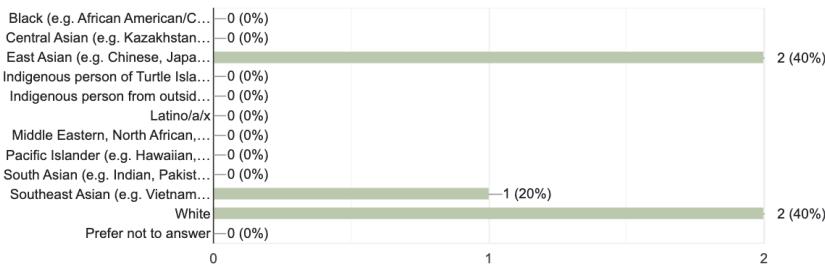
What is the highest level of education you have completed (NOT currently attending)? [Copy](#)

5 responses



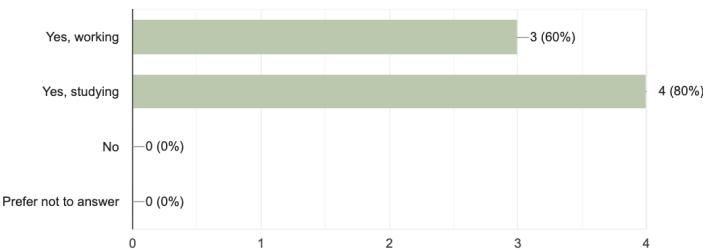
Please indicate which of the following terms best describes your racial and/or ethnic identity. Select all that apply. [Copy](#)

5 responses



Are you currently working or studying in the STEM (science, technology, engineering, mathematics) field? [Copy](#)

5 responses



If yes, what concentration (occupation, major/program, etc.) are you in?

5 responses

astronomy spec, cs major, math minor

statistics

UX Design

User Experience Design

Pharmacy

## A2: Open-ended Questionnaire Responses (Raw Data)

4/3/23, 8:24 PM

Usability Study - Post-Test Questionnaire

# Usability Study - Post-Test Questionnaire

This survey seeks to collect data for a usability testing for the high fidelity prototype that you have just used. Our goal with this questionnaire is to understand the perceived efficiency and satisfaction of individuals who have used the high fidelity prototype. Your opinion is very important to help us identify features that are well implemented and potential gaps in the prototype. Your responses will be recorded **anonymously**.

The survey results will be analyzed by a team of students at the University of Toronto as part of a course (CSC318H1: The Design of Interactive Computational Media). If you are interested in the results, please indicate it and leave your email address.

Thank you for taking the time to participate in our survey!

### FAQs

#### **Do I have to answer all the questions?**

No. The questions are voluntary and you can skip any questions that you would not like to answer.

#### **Who will see this information?**

This information will be visible only to our team and course facilitators (ex. professors, TAs). When used to inform our project design, the information will be combined with data from all other survey participants and no one will be able to identify any of the participants.

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

### Part 1: Efficiency of the high fidelity prototype

*The questions below are used to support our team in better understanding the efficiency of the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing an efficient platform.*

*Reminder of the tasks that you were asked to complete:*

- Signing up: Sign up on the platform and filling out the questionnaire
- Searching for / messaging a mentor: Find the mentor page, filter mentors, request to be mentees
- Messaging mentors: Find the message page and message mentors or other individuals within the application
- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

Please enter your unique participant identifier (please consult the study investigator) \*

032901

Did you find any specific tasks particularly challenging or time-consuming? If so, why?

accessing the mentor page was a bit unclear. Since its more intuitive to click on the mentor to get to the page rather than a different button at the button.

Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?

I found that looking for applicant and connecting with them was done very efficiently.

Were there any features or functionalities that you found particularly helpful in making the application more efficient to use?

the recommended mentors feature was very useful for finding mentors

Were there any features that were missing or could be improved to make the application more efficient?

It would be good if the user can see on other people's account if they have already sent a request in the past to that specific user.

How would you compare the efficiency of this application to similar applications you have used?

I liked the visual idea of the growth feature, as it helps the user see how far they have come.

Was there anything about the application that you found particularly frustrating? What improvements would you suggest making to the application to make it more efficient?

I found it a bit frustrating to find the requests which I have sent in the past.

#### Part 2: Satisfaction of the high fidelity prototype

*The questions below are used to support our team in better understanding the satisfaction of users for the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing a platform that meets users' expectations.*

*Reminder of the tasks that you were asked to complete:*

- Signing up: Sign up on the platform and filling out the "matching" questionnaire
- Searching for / messaging a mentor: Find the mentor page, filter mentors, request mentors to be mentees
- Messaging mentors: Find the message page and message mentors or other
- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

How satisfied were you with the overall design and layout of the application? Did you find it easy to navigate and understand the platform?

I found the overall design very intuitive and clear to read.

Did the application meet your expectations? Why or why not?

the application met my expectations in allowing the user to find mentors to connect with efficiently.

Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?

I found myself lost when trying to locate my history of sent request, but it did not reduce the satisfaction significantly

Were there any features or functionalities that you particularly liked or disliked about the application? Why?

I really liked the recommendation of mentors feature, based on my interests.

Would you consider using the application again in the future? Why or why not?

I would consider using the app in the future in order to find more potential mentors in the future.

Would you recommend the application to others? Why or why not?

I would recommend this app to other women in STEM, those who recently completed high school and are looking in to how to start their career.

Thank you so much for your time!

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

To assist us in our review of this data collection, please share any comments about the questions or this process with us here. We appreciate your feedback as we work to collect accurate and inclusive information.

I have no questions or comments aside from what was mentioned in previous questions.

By clicking the "I consent" checkbox, you consent to having read and signed the consent form given to you prior to the study. You also consent to the data that you have entered in this questionnaire to be collected and used as described in the introduction to this questionnaire. \*

I consent

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# Usability Study - Post-Test Questionnaire

This survey seeks to collect data for a usability testing for the high fidelity prototype that you have just used. Our goal with this questionnaire is to understand the perceived efficiency and satisfaction of individuals who have used the high fidelity prototype. Your opinion is very important to help us identify features that are well implemented and potential gaps in the prototype. Your responses will be recorded **anonymously**.

The survey results will be analyzed by a team of students at the University of Toronto as part of a course (CSC318H1: The Design of Interactive Computational Media). If you are interested in the results, please indicate it and leave your email address.

Thank you for taking the time to participate in our survey!

## FAQs

### **Do I have to answer all the questions?**

No. The questions are voluntary and you can skip any questions that you would not like to answer.

### **Who will see this information?**

This information will be visible only to our team and course facilitators (ex. professors, TAs). When used to inform our project design, the information will be combined with data from all other survey participants and no one will be able to identify any of the participants.

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## Part 1: Efficiency of the high fidelity prototype

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- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

Please enter your unique participant identifier (please consult the study investigator) \*

032902

Did you find any specific tasks particularly challenging or time-consuming? If so, why?

I wasn't sure how to view my sent requests, or how to message a mentor. besides that, it was all really intuitive.

Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?

yes! iconography was helpful and informative

Were there any features or functionalities that you found particularly helpful in making the application more efficient to use?

i really like the forum and mentor search capabilities

Were there any features that were missing or could be improved to make the application more efficient?

no

How would you compare the efficiency of this application to similar applications you have used?

def similar to linkedin, but ofc without the mentorship piece. I haven't used other mentorship matching tools, so I cannot really compare, but it seemed really efficient!

Was there anything about the application that you found particularly frustrating? What improvements would you suggest making to the application to make it more efficient?

i think the viewing requests and mentor messaging could be a bit clearer, but maybe that's just me!

#### Part 2: Satisfaction of the high fidelity prototype

*The questions below are used to support our team in better understanding the satisfaction of users for the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing a platform that meets users' expectations.*

*Reminder of the tasks that you were asked to complete:*

- Signing up: Sign up on the platform and filling out the "matching" questionnaire
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- Messaging mentors: Find the message page and message mentors or other
- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

How satisfied were you with the overall design and layout of the application? Did you find it easy to navigate and understand the platform?

very satisfied

Did the application meet your expectations? Why or why not?

yes! it was pleasing and easy to use

Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?

i did have a few mishaps, but did not impact my satisfaction

Were there any features or functionalities that you particularly liked or disliked about the application? Why?

really liked the forum as well as the sproud/growth iconography

Would you consider using the application again in the future? Why or why not?

yes

Would you recommend the application to others? Why or why not?

yes! was cute and easy to use. seemed geared towards young people without being overt

Thank you so much for your time!

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

To assist us in our review of this data collection, please share any comments about the questions or this process with us here. We appreciate your feedback as we work to collect accurate and inclusive information.

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The survey results will be analyzed by a team of students at the University of Toronto as part of a course (CSC318H1: The Design of Interactive Computational Media). If you are interested in the results, please indicate it and leave your email address.

Thank you for taking the time to participate in our survey!

## FAQs

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Please enter your unique participant identifier (please consult the study investigator) \*

032903

Did you find any specific tasks particularly challenging or time-consuming? If so, why?

I found it a little difficult to find the sent mentor requests. It could have been because I was nervous during the testing, or I just thought it would be under messages.

Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?

Yes

Were there any features or functionalities that you found particularly helpful in making the application more efficient to use?

I really liked the filter option when finding a mentor!

Were there any features that were missing or could be improved to make the application more efficient?

How would you compare the efficiency of this application to similar applications you have used?

Was there anything about the application that you found particularly frustrating? What improvements would you suggest making to the application to make it more efficient?

Part 2: Satisfaction of the high fidelity prototype

*The questions below are used to support our team in better understanding the satisfaction of users for the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing a platform that meets users' expectations.*

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- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

How satisfied were you with the overall design and layout of the application? Did you find it easy to navigate and understand the platform?

The design was aesthetically pleasing and simple! I found it really easy to navigate around the app.

Did the application meet your expectations? Why or why not?

Yes! It was nicely designed and showcased a lot of features.

Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?

I had some trouble learning more about the mentor's current job. I had to scroll up to click on her current workplace. I think it would help if the current workplace is linked in the experience section. It was something small and did not affect my satisfaction with the application.

Were there any features or functionalities that you particularly liked or disliked about the application? Why?

.....

Would you consider using the application again in the future? Why or why not?

Yes! It is impactful for women in STEM to connect with each other.

Would you recommend the application to others? Why or why not?

Yes, I'll recommend this application to my peers who are women in STEM to help them with their career development.

Thank you so much for your time!

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

To assist us in our review of this data collection, please share any comments about the questions or this process with us here. We appreciate your feedback as we work to collect accurate and inclusive information.

.....

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Thank you for taking the time to participate in our survey!

## FAQs

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No. The questions are voluntary and you can skip any questions that you would not like to answer.

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## Part 1: Efficiency of the high fidelity prototype

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Please enter your unique participant identifier (please consult the study investigator) \*

032904

Did you find any specific tasks particularly challenging or time-consuming? If so, why?

Finding the request I sent to the Mentor was a little confusing. And, acquiring my growth (?) was a little confusing as well.

Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?

Nothing in particular made any tasks hard to complete

Were there any features or functionalities that you found particularly helpful in making the application more efficient to use?

The list of mentors on the home page was helpful and straightforward.

Were there any features that were missing or could be improved to make the application more efficient?

Not in particular

How would you compare the efficiency of this application to similar applications you have used?

I think it is similar but more straightforward.

Was there anything about the application that you found particularly frustrating? What improvements would you suggest making to the application to make it more efficient?

Not in particular

#### Part 2: Satisfaction of the high fidelity prototype

*The questions below are used to support our team in better understanding the satisfaction of users for the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing a platform that meets users' expectations.*

*Reminder of the tasks that you were asked to complete:*

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- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

How satisfied were you with the overall design and layout of the application? Did you find it easy to navigate and understand the platform?

I'm overall satisfied! It was intuitive and easy to follow.

Did the application meet your expectations? Why or why not?

Yes, because I'm using it to find a mentor so the process was what I expected.

Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?

Not in particular other than finding the "sent request" to the mentor. But, it did not affect my satisfaction.

Were there any features or functionalities that you particularly liked or disliked about the application? Why?

I liked all of the features, they were visually nice and intuitive.

Would you consider using the application again in the future? Why or why not?

Yes! I think it would be very helpful for people who want to network.

Would you recommend the application to others? Why or why not?

I would recommend it to my fellow friends who are women and working in stem.

Thank you so much for your time!

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

To assist us in our review of this data collection, please share any comments about the questions or this process with us here. We appreciate your feedback as we work to collect accurate and inclusive information.

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I consent

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The survey results will be analyzed by a team of students at the University of Toronto as part of a course (CSC318H1: The Design of Interactive Computational Media). If you are interested in the results, please indicate it and leave your email address.

Thank you for taking the time to participate in our survey!

## FAQs

### **Do I have to answer all the questions?**

No. The questions are voluntary and you can skip any questions that you would not like to answer.

### **Who will see this information?**

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## Part 1: Efficiency of the high fidelity prototype

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- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

Please enter your unique participant identifier (please consult the study investigator) \*

033101

Did you find any specific tasks particularly challenging or time-consuming? If so, why?

N/A

Did you feel that the application helped you accomplish the tasks quickly and efficiently? If not, what factors slowed you down or made the process more difficult?

Yes

Were there any features or functionalities that you found particularly helpful in making the application more efficient to use?

Clear icons, easy on the eyes, not too much text.

Were there any features that were missing or could be improved to make the application more efficient?

Making the icons below the mentor's photo clickable (ie. the Visa icon) would help. (Instead of having to click on just the text). Also, how do I view the requests to mentors I've made?

How would you compare the efficiency of this application to similar applications you have used?

Very efficient!

Was there anything about the application that you found particularly frustrating? What improvements would you suggest making to the application to make it more efficient?

Instead of having to "claim" awards, can they just be automatically rewarded?

#### Part 2: Satisfaction of the high fidelity prototype

*The questions below are used to support our team in better understanding the satisfaction of users for the high fidelity prototype. The data we collect will be entirely **anonymous** and will only be used by our student team to inform our project in designing a platform that meets users' expectations.*

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- Messaging mentors: Find the message page and message mentors or other
- Forum/discussion board: Upvote posts, create new posts, add tags to the posts
- Grow your plant/achievement: You can grow your plant based tasks completed or achievements

How satisfied were you with the overall design and layout of the application? Did you find it easy to navigate and understand the platform?

Yes, very easy to navigate.

Did the application meet your expectations? Why or why not?

Yes, because it makes it very easy for me to search for mentors that fit my interests. It would be nice if we could type our own tags as well, instead of just clicking pre-formed tags.

Did you encounter any problems or issues while using the application? If so, how did they affect your satisfaction with the application?

I didn't know how to see the requests I had made.

Were there any features or functionalities that you particularly liked or disliked about the application? Why?

I enjoyed the design and simple appearance of the app, which made it very easy for me to navigate.

Would you consider using the application again in the future? Why or why not?

Yes! It's a good networking method for women in STEM.

Would you recommend the application to others? Why or why not?

Yes, because it is easy to use and can help many mentees/mentors connect with each other!

Thank you so much for your time!

If you have any other questions please feel free to reach out at [umayrahchonee@gmail.com](mailto:umayrahchonee@gmail.com).

To assist us in our review of this data collection, please share any comments about the questions or this process with us here. We appreciate your feedback as we work to collect accurate and inclusive information.

By clicking the "I consent" checkbox, you consent to having read and signed the consent form given to you prior to the study. You also consent to the data that you have entered in this questionnaire to be collected and used as described in the introduction to this questionnaire. \*

I consent

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## B: Protocol and Consent Form

# Research Protocol - Women in STEM App

**1. Project Title:** High-Fidelity Prototype Study on a Personalized Matching & Networking App for Women in STEM.

**2. Investigators:** Chyna Hui (chyna.hui@mail.utoronto.ca), Cindy Ly (cindykim.ly@mail.utoronto.ca), Lucy Ma (lucyxinyu.ma@mail.utoronto.ca), Maggie Chen (maggiemc.chen@mail.utoronto.ca), Umayrah Chonee (umayrah.chonee@mail.utoronto.ca), Tina Zhang (yizhoutina.zhang@mail.utoronto.ca)

**3. Purpose:** The purpose of our research is to test a high-fidelity prototype of an app that aims to provide support to women-identifying students in STEM education. This app aims to connect women with industry professionals, and other peers within a safe and inclusive space. The data collected through recordings and questionnaires will capture both the usability of the prototype and the degree to which the design satisfies the goals, needs, and wants of our target audience.

**4. Process to be followed:** After asking participants to read and sign our consent form, we will conduct a high-fidelity user testing session, allowing participants to perform representative activities that will be completed on a phone using the prototype. **The facilitator will ask participants to interact with the system while voicing their thoughts aloud. This process will be filmed with consent from the participants. Afterwards, participants will be asked to complete both a questionnaire based on a System Usability Scale (SUS) as well as an open-ended survey.**

**5. Participant selection:** Participants will be women who are currently studying in a STEM field wishing to pursue STEM as their career path.

**6. Relationships:** Our relationship to the participants may be described as follows: friends, acquaintances, and peers.

**7. Risk and benefit:** There will be minimal risk to the participants, for example that they feel that they have wasted their time. The only benefit will be to contribute to the education of the investigators. Participants are free to withdraw before or at any time during the study without the need to give any explanation.

**8. Consent details:** We will brief the participants about the purpose of the study, and explain the [attached consent form](#) to them, and ensure that they consent to participate and sign the consent form.

**9. Compensation:** Participants will receive no compensation.

**10. Information sought:** The information to be sought is how usable our high-fidelity prototype is. We aim to see user patterns and utilize insights to further improve our prototype.

**11. Confidentiality:** Information will be kept confidential by the investigators. Names or other identifying or identified information will not be kept with the data. The only other use will be to include excerpts or copies in the assignment submitted, but names and other identifying or identified information will not be submitted.

## **Consent Form: Supports for Women in STEM**

I hereby consent to participate in a research study conducted by Chyna Hui, Cindy Ly, Lucy Ma, Maggie Chen, Umayrah Chonee, Tina Zhang  
for an assignment in University of Toronto Computer Science 318, *Design of Interactive Computational Media*.

I agree to participate in this study, the purpose of which is to test a high fidelity prototype of an app that aims to provide support to women-identifying students in STEM education.

I understand that:

- The procedure to be used is a think aloud evaluation followed by 2 questionnaire surveys.
- I will receive no compensation for my participation.
- I am free to withdraw before or any time during the study without the need to give any explanation.
- All materials and results will be kept confidential, and, in particular, that my name and any identifying or identified information will not be associated with the data.

### **PARTICIPANT**

Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

### **INVESTIGATOR(s)**

Name \_\_\_\_\_ Signature \_\_\_\_\_