P2P Learning | Evaluate: User Test Report

Vedant B, Tommy N and Himani P

Content

Introduction

With increasing demands from school, students can oftentimes face difficulty balancing their post-secondary course work along with other extra-curricular and personal activities. Active and busy students do not have enough time to give their academic deliverables justice without making sacrifices to other aspects of their lives. A digital solution that can facilitate connections with other speers can drastically lessen the load of one individual by spreading the learning over more peers through collaborative group learning. In this part of our study, we report our informal user testing where we sought potential users to provide feedback and criticism to our low-fidelity digital solution to address the aforementioned problem.

Continuing from our low-fidelity prototype, our team conducted user testing to further assess our design and prototype. Before initiating this user testing we conducted a cognitive walkthrough (CW) on our initial low-fidelity prototype with our CPSC 544 course peers. We received substantial feedback from CW which we used to make a few minor alterations to the low-fidelity prototype before delivering on hte user testing. One of the main problems identified and fixed during this process was:

- **Problem:** Problem with understanding "My notices".
  Potential solution: Considered wrapping "My Notices" within the bulletin. This might help establish meaning for certain UI entities.

Apart from this, we also received more feedback from our CW; these were generally regarding minor UI components that were not our main focus or scope of this low-fidelity prototype. We have, however, noted this feedback and plan to execute some of them as we move on to our medium-fidelity prototype.

We divide the objective for the user-test study into two parts: higher-level and lower-level based on the scope we have with our lo-fi prototype. The objective for this user-test study are:

- **Higher level**
  - In what ways is the app effective at conveying information about the bulletin board, its notices, and the user's own notices? What evidence is there that its organization is consistent with what most users may be familiar with?
  - What are some additional expectations participants may have when navigating through the limited flow?
- **Lower level**
  - How understandable is the navigation bar's items at the base of the interface? Can users identify what each tab ad may entail without navigating to it?
  - To what extent can users articulate what is on the bulletin board? Will users understand that the bulletin contains notices from users trying to form collaborative learning groups for a respective topic/field?

User Test Methods

With the low-fidelity design prototype and a CW completed, our team set out to do some user testing to further critique our prototype. After the CW, we made a few small changes to our low-fidelity prototype to better prepare it for user testing. We removed the "My Notices" section where the user is able to see and interact with the notices or groups that they have created; this was because our current flow does not make use of this at all and so it was better to bring it back when it had more purpose as well as a better

design to communicate its functionalities. Another change involved showcasing what the chatting screen may look like. We added this to give meaning to all four main items in the navigation bar at the base of the interface and to include all of the possible screens associated with this task. Our last set of changes involved updating the placeholder texts to include more realistic data that would better inform our users when they navigate the platform.

Given our limited time, our team is conducting an informal user testing to garner some feedback and criticism before delivering on our medium fidelity. The informality refers to the small number of participants, the recruitment process, the overlapping between user testing and CW, and the short timespan in setting up robust and thorough user testing. For this informal user study, we informally recruited (*n=3*) participants sampled conveniently from our network. The only requirement was that the participant was a post-secondary student. This requirement was to ensure our feedback and criticisms would be most representative of the target user group of this mobile application. Participants were required to read and return a signed consent form via our UBC's secured domestic emailing network (see Appendix B.1).

Our usability testings were conducted mixed in-person and virtually via Zoom through direct observation of the participants' screen to monitor their interaction with the low-fidelity prototype. Of the three participants, two were studied virtually over Zoom and one was studied in–person. Each study ran no longer than ten minutes in duration. Participants were required to have a desktop or mobile device with a stable internet connection to explore the prototype with Zoom installed for screensharing for virtual observations.

During the user testing, participants were all provided with the same Figma prototype link to ensure all participants were being tested on a uniform and consistent prototype. Our team prepared a short script to introduce the study along with the associated tasks. The script is as follows:

> *Thank you for taking the time to be a participant in this usability study. As you may already know, this study is part of our UBC CPSC 544 Human Computer Interaction course project. The objective of this study is to determine the effectiveness of a low-fidelity or rough draft mobile interface design prototype. Our project is about connecting students to optimize collaborative learning. You will be taking on the persona of Alencia during this prototype. The study will assume you have already gone through the onboarding process where you would have created your account, and pre-filled your courses, interests, and other additional information to allow the system to cater to you. This usability study should take no longer than 10 minutes of your time. Throughout this study, we want you to know that we are not testing you, but instead, we are testing our prototype. That being said, please do not hesitate to speak your mind and voice any frustration, concerns, or even questions you have while interacting with this prototype. This study will be the most beneficial if you can think aloud, be verbal, and be explicit as much as possible. You will be asked to complete a series of tasks. I will provide guidance throughout the entire process and may ask for further clarification. Please keep in mind that the prototype will miss some basic functionalities. You may be asked to comment on your expectations, instead. Do you have any questions?*

The users were guided through five major tasks that were split over sixteen screens (see Appendix C.2):
1. What is the application about?
2. Search for *"cloud computing"*
3. Manipulate the filters and sort
4. Request to join a machine learning (ML) group
5. Add the meeting to an external calendar

These tasks were selected to ensure that all of its subtasks would showcase every aspect of this application except for the registration, onboarding, creating, and settings flow. We believed this would be important because it is what we expect most students would be utilizing this application for. This task flow also reflects the updated task example in Appendix C.1. All observations from each study were noted in the participants' respective coding sheets (see Appendix B.2). The data will then be collected and summarized into one table for qualitative analysis to draw insights into what is needed to be further iterated to deliver an effective medium-fidelity prototype that would support our primary task example (see Appendix C.1).

User Test Results

The detailed information from the user-study of our low-fidelity prototype on the three recruited users can be found in Appendix B.2. We performed further qualitative analysis on this collected information by summarizing the key points on different components of the prototype. This summary can be found in Table 1. Each summary references the respective participant identification number (*e.g. P1, P2, P3*).

Prototype Components	Summary
Navigation bar	Icons on the navigation bar are understandable and are a good representation of corresponding screens. [P1, P3]. Sufficient Options [P2]
Bulletin & notices	Lists all the groups with information like tags and group size. Also, an option to expand each notice [P1]. Couldn't understand why it is called Bulletin. [P2, P3]
Search	Easy, universal and consistent. Like the post search feature for adding notices or setting reminders. [P1, P2, P3]
Sort and filter	In general easy [P1, P2, P3]. Except some minor concerns [P1, P3].
Individual notice	More structured information required for each notice [P2]. Who does the message go to, admin? [P1]
Joining group	No indication of whether a join request was sent or not [P1]. In general, it is easy to understand. [P1, P2, P3]

| Notification | Consistent and easy [P1, P2, P3] Notification status using white dot in unclear [P1] |
| Chat | Easy and consistent [P1, P2]. Is there an option for personal chat or just groups? [P3] |

Table 1: *Summary of feedback received from participants corresponding to the prototype component.*

Based on the feedback collected and summarized, the key concerns with the prototype that requires attention with their potential solutions can be found in Table 2.

Identified severe concerns	**Potential solutions**
Nomenclature with bulletin and notices	To ease the UI across the home page and rename it to something more intuitive and understandable. Perhaps, "Dashboard".
Information within individual notice and its structure.	Lay out a specific template for notice that is more structured and lays out most of the important information that should be present about notices.
Chat option (Whether individual or group)	Improve the inbox with a separation for group and individual messages with potentially a slide feature.

Table 2: *Identified severe concerns with the prototype and corresponding potential solutions.*

Apart from the above-listed concerns, we label the other concerns identified as "minor". These arise mostly from the screens that were not particularly in the scope of our lo-fi prototype. We plan to keep them in mind while we dive deeper into this component during designing our medium-fidelity prototype. The results very well addressed our objective with the user study. Most of the feedback received was about our higher-level objectives and gave us a stronger sense of the direction we need to take moving forward in our design process.

Appendix

Appendix A: Team Member Contributions

1. Himani P
   - User testing, Analysis
2. Vedant B
   - User testing, UI improvement, Report drafting, Analysis, Review
3. Tommy N
   - User testing, UI update, Protocol, Coding sheet, Script, Review

Signed by TN, VBahel, HP on Nov 22, 2022 .

Appendix B: Study Materials

B.1) Consent Form

🅦 HCICourseEthics-ConsentForm-General-v1.1_P2PLearning.docx

THE UNIVERSITY OF BRITISH COLUMBIA

Department of Computer Science
2366 Main Mall
Vancouver, B.C., V6T 1Z4

Consent Form

Human-Computer Interaction Course Projects

Principal Investigator: Dongwook Yoon, Assistant Professor, Department of Computer Science, University of British Columbia, yoon@cs.ubc.ca, 604-822-1993

Co-principal Investigator: Karon MacLean, Dr, Department of Computer Science, University of British Columbia, maclean@cs.ubc.ca, 604-822-8169

Student Investigators: Bahel, Vedant, bvedant@cs.ubc.ca
Nguyen, Tommy, tommyvn@cs.ubc.ca
Prajapati, Himani, himani27@student.ubc.ca

Introduction: Thank you for considering participating in this study. This work is affiliated with the UBC course "Human Computer Interaction" (CPSC 544). Please note that we are seeking people who may have some experience looking for or being a tutor as well as people with experience learning in group settings (*2 or more people*).

Purpose: The overall purpose of this study is to determine the effectiveness of the current of our low-fidelity design prototype

What you will be asked to do: After you have read this document, I/we will respond to any questions or concerns that you may have. Once you have signed this consent form, you will be asked to:

- interact with digital systems (e.g., a laptop or phone)
- interact with digital design prototype
- think aloud and provide regular verbal feedback
- answer interview questions

No activities that involve in-person interaction will take place during the suspension of in-person activities due to COVID-19, with the exception of two cases: with the exception of three cases: (Case 1) naturalistic observation can take place with physical distancing, (Case 2) research done with people in the same household/bubble, e.g. family, so long as remains low-risk and non-coercive, and (Case 3) the research plan satisfies both Safe Research Guidelines and Safe Research Plan provided by UBC BREB.

This should take about 30 minutes and be completed in 1 session.

How the data collected will be used: Data collected (including any audio/video recordings) will be used for analysis and may also be used for class project presentations and other research presentations. Although only a course project in its current form, this project may, at a later date, be extended by one or more of the student investigators to be submitted as a research publication.

Compensation: There is no compensation for participating in this study.

Confidentiality: The results of your participation will be reported without any reference to you specifically. All information that you provide will be stored in Canada. It will be treated confidentially and your identity will not be revealed in reporting the study results. The two exceptions are: (1) excerpts from the video/audio recording in which a participant can be identified may be presented in a class project presentation (but any other presentation venue, such as a scholarly conference, will require that participants be non-identifiable in the video/images), and (2) we request but cannot enforce focus group members to keep discussions from any focus group confidential.

Data retention: Identifiable data and video/audio recordings will be stored securely in a locked metal cabinet or in a password protected computer account. All digital data will be encrypted. All data from individual participants will be coded so that their anonymity will be protected in any reports, research papers, and presentations that result from this work.

Protecting identities while using Zoom: If using Zoom, you can log in using only a nickname or a substitute name or research code given ahead of time by the researcher, you can turn off your camera, and you can mute your microphone (if it is not needed).

Contact for information about the rights of research subjects: If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

I, __REBECCA WANG_____, have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw at any time.

_____RW_____	NOV 20, 2022
Participant's Signature	Date

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I, _____PARTH SEHTIYA_____, have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw at any time.

_____ Nov 20ᵀᴴ, 2022
Participant's Signature   Date

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I, _____Bhagya T._____, have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw at any time.

_____BT_____19/09/2022_____
Participant's Signature   Date

B.2) Coding Sheets & Participant response

PARTICIPANT 1

Task 1: What's this mobile app all about? What do you see and notice? What do you expect?

Subtasks	Complete?	Negative remarks	Positive remarks	Other
Navigation bar?	■			Home is where i am, messages to message ppl, add to create own group/card, notifications, profile account
Bulletin? And its notices?	■			List of groups or space, maybe a forum to talk about the place, tags and group size, expand for more info about that space? Tapping in will take to space
UBC logo?	■			Assume campus app, or something for UBC, dropdown for setting or change campus
Anything else?	■			

Task 2: Try to search for "cloud computing"

Subtasks	Complete?	Negative remarks	Positive remarks	Other
On the search bar, type "cloud computer"	☑			Searched by viewing list first
What can you do now?	■			Can get notified when someone create a notice, this is really cool and convenient, not sure what notice is but seems like its a space

Task 3: Clear search, manipulate filter and sorts

Subtasks	Complete?	Negative remarks	Positive remarks	Other
Clear search	☑			
Clear filter	☑			
Open filter	☑	Looks like can scroll horizontally but theres two rows so can we		

		horizontally scroll one row at a time?		
Set new filters	☑			
Sort by most viewed	☑			
Set these as default	☑	Wasn't immediately clear what set as default was, assumed set as default was like save and would close the filter		
Close filter	☑	Seems like an additional step. Probably fine but not as intuitive		
Ask for remarks?	■		Know where to look for things, clearly labelled, nice to see what my filters or sorts after its done without having to open it up again	

Task 4: Request to join the machine learning (ML) group via its notice

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Click on ML notice	☑		Pretty clear	Click on first one, can see what that group is about and its size, can message (not sure who, maybe the admin or group chat), can request to join the group
Request to join with no additional messages	☑	No indication of whether the request was sent or not	Pretty clear. Closing is nice in case don't wanna join	

Task 5: Check notification, chat, and add meeting to external calendar

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Notice anything in the navigation bar?	☑	Did not notice until mentioned		
Click on notification in navigation bar	☑	White icon seem like a notification status?	Deleting seems fine. Seems important	See notifications, wonder what search and filter will do, see the new notification icon, and a close icon, figures can send a group a chat. Maybe it's weird to chat with a notification?

Check ML notice and chat with the group	☑	Not sure how to check it but can chat	Chat seems straightforward. Have seen this before in other messaging app. Seems very consistent and familiar	
Add meeting time to calendar	☑		Prompt button is convenient	
Overall FLOW				
Additional comments:		Everything felt small, but doesn't seem to affect usability, kinda weird to see the bar opening up before searching–having to click twice to search, no indication of which page i'm on in the app– i can guess though		User went through entire flow again to critique– most notes were added rectroactively

PARTICIPANT 2				
Task 1: What's this mobile app all about? What do you see and notice? What do you expect?				
Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Navigation bar?		-	Relevant, Understandable, Sufficient options	
Bulletin? And its notices?		Couldn't understand the bulletin. Could call it dashboard or simply "groups".		
UBC logo?			Could understand the it's a UBC (school level) app	
Anything else?		Relevant info/summary in group description? What if people don't add that info in description? So how it works? Couldn't understand how long the post remains active? Who is the admin? Can there be multiple admin? What extra authority does the admin have? Can pic/file/vide/location be shared in chat?		Tags: Predefined could be more effective
Task 2: Try to search for "cloud computing"				
Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**

On the search bar, type "cloud computer"	☑		Good (universal/general)	
What can you do now?	⬛		Create alert, create own group is amazing feature	

Task 3: Clear search, manipulate filter and sorts

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Clear search	☑		Ok	
Open filter	☑		Decent(works)	Have pre-defined tags to filter out.
Clear filter	☑		Ok	
Set new filters	☑		Ok	
Sort by most viewed	☑		Ok	
Set these as default	☑		Ok	
Close filter	☑		Ok	
Ask for remarks?	⬛			

Task 4: Request to join the machine learning (ML) group via its notice

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Click on ML notice	☑	Description should be relevant. Not very descriptive. The Basics of what's happening in a group? Character limit maybe? Or some guideline on what to write so that all relevant info is included.		
Request to join with no additional messages	☑	It should be optional (or maybe as per what the admin wants). Maybe there could be option for automatic acceptance (if the admin wants it)		

Task 5: Check notification, chat, and add meeting to external calendar

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Notice anything in the navigation bar?	⬛		Notification and chat	
Click on notification in navigation bar	☑		Decent (Understandable)	

Check ML notice and chat with the group	☑		Understandable	
Add meeting time to calendar	☑		Great feature	
Overall FLOW				
Additional comments:				

PARTICIPANT 3

Task 1: What's this mobile app all about? What do you see and notice? What do you expect?

Subtasks	Complete?	Negative remarks	Positive remarks	Other
Navigation bar?		None	Easy to identify, nice use of icons	
Bulletin? And its notices?		None	What is a bulletin? Looked at the screen then assume it may be like dashboard	
UBC logo?		Is this just for UBC students? What if I want to learn but not affiliated with a university?		
Anything else?		None		

Task 2: Try to search for "cloud computing"

Subtasks	Complete?	Negative remarks	Positive remarks	Other
On the search bar, type "cloud computer"	☑	None	Easy to accomplish	
What can you do now?				

Task 3: Clear search, manipulate filter and sorts

Subtasks	Complete?	Negative remarks	Positive remarks	Other
Clear search	☑	None	Easy to accomplish	
Open filter	☑	None	Easy to accomplish	
Clear filter	☑	None	Easy to accomplish	

Set new filters	☑	What if I set it but there is nothing coming up when I search with that filter.	Easy to accomplish	
Sort by most viewed	☑	None	Easy to accomplish	
Set these as default	☑	None	Easy to accomplish	
Close filter	☑	None	Easy to accomplish	
Ask for remarks?	■	None	Very similar to other websites, so find easy to understand all the steps	

Task 4: Request to join the machine learning (ML) group via its notice

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Click on ML notice	☑	If I click will I be joined or I am just looking at the information? Also, is there any predefined group size per each notice?	None	None
Request to join with no additional messages	☑	None	Done	None

Task 5: Check notification, chat, and add meeting to external calendar

Subtasks	**Complete?**	**Negative remarks**	**Positive remarks**	**Other**
Notice anything in the navigation bar?	■	None	Done	None
Click on notification in navigation bar	☐	None	Yeah I kinda like this	None
Check ML notice and chat with the group	☐	None	Done	Option to make personal messages on group chat?
Add meeting time to calendar	☐	None	Done	Will this be directly to my gmail calendar? I don't want that.

Overall FLOW	■			
Additional comments:		Overall, I found there are some things like ….options for chat, but there is no option for personal chat in groups, …are there any options to join without any university affiliation?	I understand almost everything looking at the screen. This is very similar to other apps I am using so yes most of the things are clear.	None

Appendix C: Current task examples, steps, conceptual model

C.1) Updated Task Example

Alencia uses peer-learning app to search and look for people in her university or local area to collaborative learn with in her two desired courses: cloud computing and machine learning (ML)
Alencia is a 3rd-year undergraduate student in Computer Science. She is a fairly competent student who optimizes her schedule really well, however, she is looking for a suitable peer to connect with to better make use of her time. In the past, she has tried to reach out to her classmates in-person and through social platforms provided by her classes, like Piazza and Canvas, but they never really gain much traction. She is not satisfied learning with friends as she thinks of it as a distraction—ultimately leading to unproductive work. Alencia is looking for help in her "cloud computer" course and is struggling with the "decision tree" concept from her machine learning (ML) course. To optimize her time, Alencia believes that she can accomplish much more if she can fill in the gaps in her knowledge by learning collaboratively in a group. Also, she likes to strengthen her knowledge by teaching as well as learning from others.

She grabs her phone and opens a peer-learner app. Ensuring she is in her UBC study space, she first looks for a "Cloud computer" group by typing it into the search bar. If there's no result, she'll consider setting a reminder, clear search and check another course. Her account is pre-filtered to show all of her courses and things she is interested in; she wants to clear the filters as well as sort it by most viewed to identify the popular groups. She sets this as the default. Alencia finds an "ML" group and requests to join it. After joining, she gets a notification in the navigation bar and checks it out. Liking the group, she joins and adds it to her calendar.

C.2) Low-Fidelity Prototype Steps

Home Screen
1. Begin search
2. Search "c"
3. Search "cloud computing"
4. Clear search
5. View filter
6. Clear filter
7. Select new filters
8. Sort by most viewed
9. Set new default filter and sort
10. Close filter
11. View machine learning notice (ML 4Ever)
12. Request to join
13. Continue to request to join without messaging

Notification
14. View notification

Chat

15. Chat with ML 4Ever
16. Add meeting time to calendar

C.3) Updated conceptual model

- Our new conceptual model aims to adhere to the following metaphor where students can be part of a study hall that has a bulletin board. On the bulletin board, students or groups can post notices looking advertising collaborative learning and study groups. As a user, one can browse the notices and immediately be able to connect with the relevant individual or group to collaborate with.