

Date Mar.11

Group Name:slay\_the\_finals

# Study Room matcher

Proposal for final project

# Guidelines

Problem Statement

Design

implementation

Evaluation

Reflection

Evidence

Theories & Challenges

Q&A

# Problem : Finding the Right Virtual Study Environment

## Existing Virtual Study Rooms



## Pain Points

- Students **waste time** hopping between random virtual groups to find a comfortable match
- **No dedicated platform** that tags study rooms by major, subject, or atmosphere(music vs. quiet vs. pomodoro rooms etc.)

## Why It Matters

- A good study environment can **increase focus, reduce stress** and **foster peer interaction**
- Students can **quickly** match with peers who share interests or academic goals

## Target Users

### High school students



### College Students



### Adult learners in specific area



## Characteristics

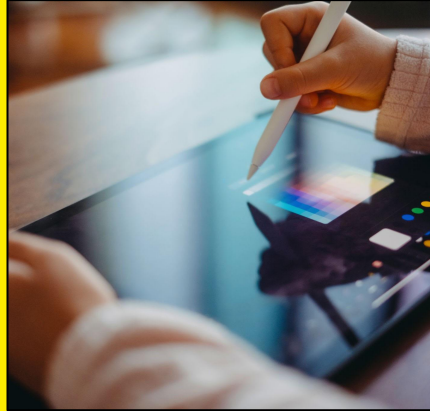
- Comfortable with online platforms but frustrated by the lack of “study room matchmaking.”
- Frequently join or create Zoom/Discord/Teams calls to study or co-work.

# timeline



## Research

Final Project Requirements Analysis  
March -April.4



## Design

Final Project Prototype design  
April.3-11



## Testing

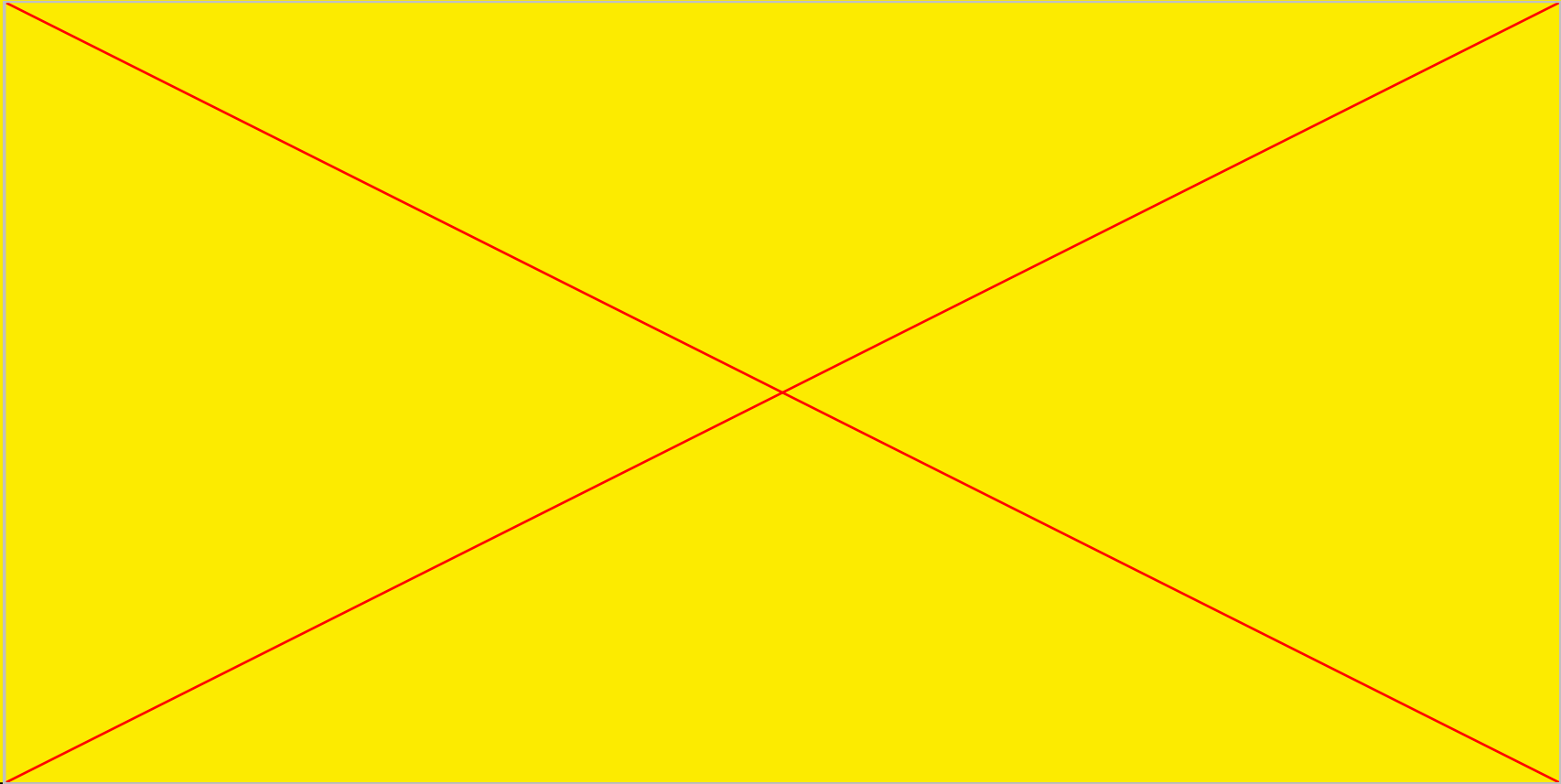
Final Project Interface and Evaluation  
April.11-18



## Presentation

Final Project Presentation  
April 18-22

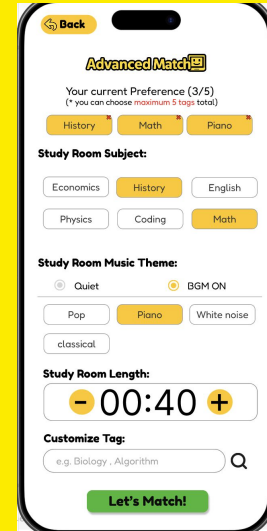
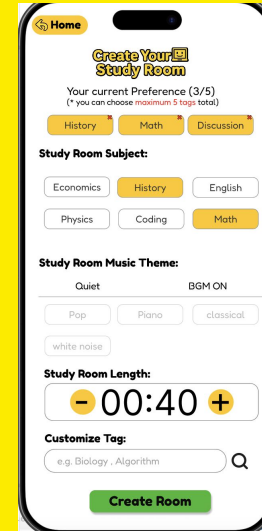
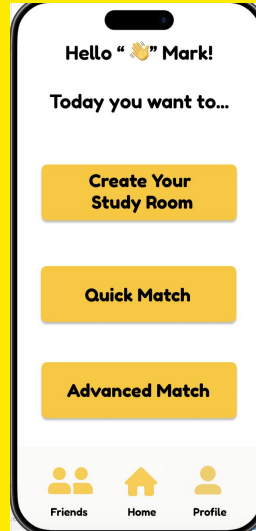
# Design Demo



# Key Designs - Core Features

## Three Core Features

- **Quick Match:** Instantly joins a room based on preset preference(in the profile).
- **Create Your Study Room:** Allows users to start a room with custom settings.
- **Advanced Match:** Enables users to select detailed preferences before matching.



# Key Designs - Real-Time Feedback

## Real-Time Feedback

- **Visible Processing Time** for Advanced Match
- "Please wait..." **loading indicator** to Match Process
- **Visible match** confirmation page with updated message: "Match Found!"

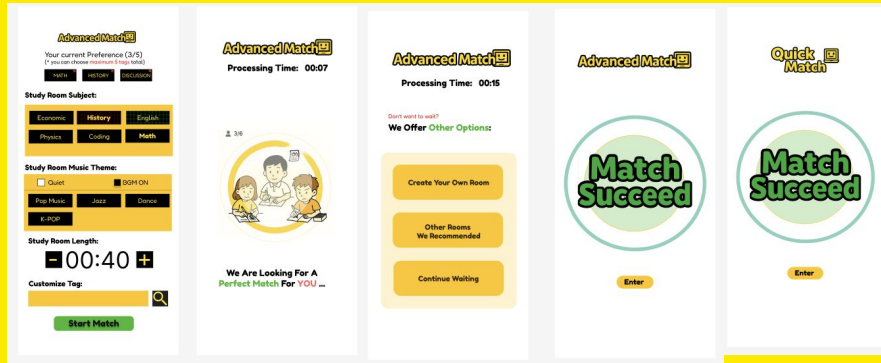




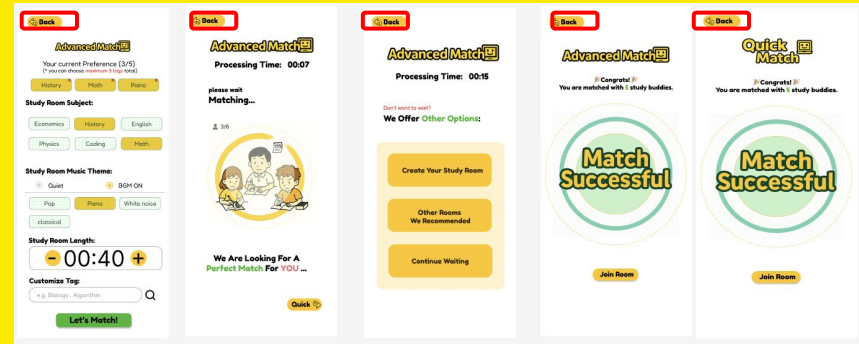
# Design Decisions Driven by Evaluation

Clear Navigation & Control: **Back** buttons added to all major flows.

- Persistent navigation icons ensure users can exit or switch match types anytime.



Original Major Flows



Final Major Flows

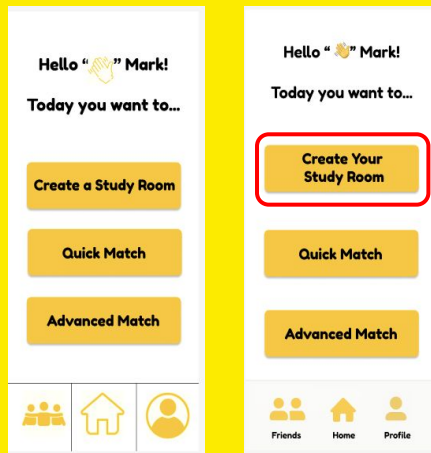
# Design Decisions Driven by Evaluation

## Refined Language & Labeling

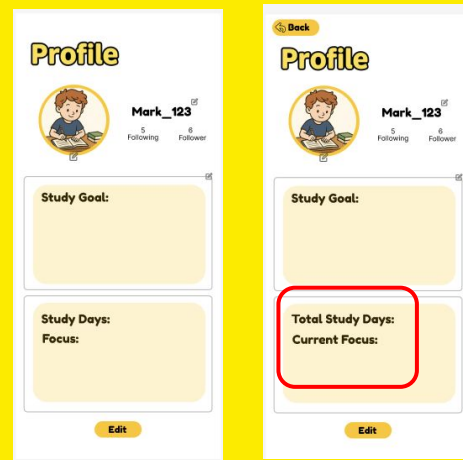
Changed phrase to a natural way



Aligned all "Create Room" tags to "Create Your Study Room."



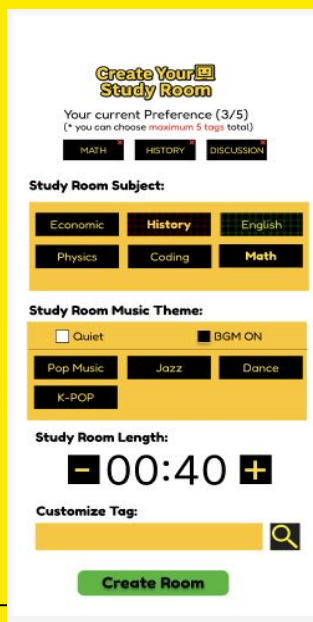
Clarify the labels



# Design Decisions Driven by Evaluation

## Visual Clarity and Tag Selection

- Selected tags now appear in **yellow**, unselected in **light green**.
- Removed noisy yellow frame background to create a cleaner look.



**Create Your Study Room**

Your current Preference (3/5)  
(\* you can choose maximum 5 tags total)

MATH HISTORY DISCUSSION

**Study Room Subject:**

Economic History English  
Physics Coding Math

**Study Room Music Theme:**

☐ Quiet ☒ BGM ON

Pop Music Jazz Dance  
K-POP

**Study Room Length:**

- 00:40 +

**Customize Tag:**

🔍

Create Room

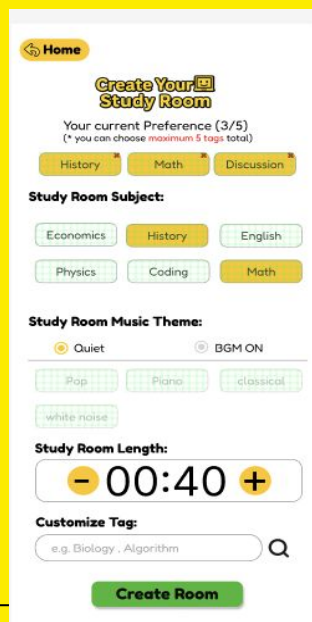
Original Design



**Quick Match**

**Match Succeed**

Enter



**Create Your Study Room**

Your current Preference (3/5)  
(\* you can choose maximum 5 tags total)

History Math Discussion

**Study Room Subject:**

Economics History English  
Physics Coding Math

**Study Room Music Theme:**

☒ Quiet ☐ BGM ON

Pop Piano classical  
white noise

**Study Room Length:**

- 00:40 +

**Customize Tag:**

🔍

Create Room

Final Design



**Quick Match**

🎉 Congratulations! 🎉  
You are matched with 5 study buddies.

**Match Successful**

Join Room

# Design Alternatives Considered

- **Modal vs Page for Match Confirmation:** We considered a pop-up modal but opted for a full confirmation screen to increase visibility.
  - **Icon-Only Navigation vs Label + Icon:** Initially used icon-only buttons, but switched to label+icon to reduce ambiguity after think-aloud feedback.
  - **Static vs Dynamic Match Preview:** Considered showing profiles of study buddies, but due to MVP scope, postponed to future iteration.
-

# Implementation

- **Tool:** Figma (for both low-fidelity wireframes and high-fidelity interactive prototype)
- **Platform:** Designed for mobile and tablet viewports
- **Interaction Design:** Clickable areas to simulate button transitions and dynamic feedback
- **Testing Method:** Conducted with high-fidelity prototype (simulated flows only; no backend)

# Important Implementation Design Decisions

1. **Loading Indicators & Process Visualization:** In Advanced Match, we added a “processing” screen with time counter and animation. To accommodate longer match times, if the wait exceeds 15 seconds, users are offered **3 alternative options** to maintain engagement.
2. **Interactive Visual States for Selection:** Tags use **color-coded** states to improve clarity and reduce cognitive load.
3. **Clear Label Guidance:** In the home page, we listed all 3 features as buttons, which **minimize the matching process** and eliminate the confusion for the first-time users.



- Improved the users' **satisfaction** of the design:
  - Advanced Match feature got **Average SUS score  $\geq 80$**  (considered "excellent" usability) from all interview participants
- Error Count: Clear visual cues and navigation enhancements kept user errors (e.g., misclicks) **under 5 per task**.
- We also received the feedback about the color match for our design. Thus, we changed the color-coded states to green for clear visualization for the future product.
- Interfaces were designed to allow  **$\geq 90\%$  of users** to successfully complete tasks:
  - All interview participants (first-time user) successfully completed the tasks

# Evaluation Strategy

## 1. Evaluation Methods Used:

- Heuristic evaluation using Nielsen's 10 Usability Principles
- User testing with 3 participants (college students with tech proficiency)
- System Usability Scale (SUS) scoring

<div>1</div> <div>Visibility of System Status</div> <div>The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.</div> <div><ul style="list-style-type: none"><li>Does the design clearly communicate its state?</li><li>Is feedback presented quickly after user actions?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>The "Matching..." screen only shows a static "Processing" timer counter, with no animation or feedback.</li><li>The user might think the app is frozen or unresponsive, especially if network delay occurs.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Add a visual loading indicator (e.g., spinning icon, minimation, or pulsing dot).</li><li>Display dynamic status feedback (e.g., "Searching for users...", "Almost there...").</li><li>Show estimated waiting time or a progress ring.</li></ul></div>	<div>2</div> <div>Match Between System and the Real World</div> <div>The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.</div> <div><ul style="list-style-type: none"><li>Will user be familiar with the terminology used in the design and lacks contextual meaning?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>The final confirmation screen says "Match Successful" which is grammatically incorrect and uncommon in user-friendly interfaces.</li><li>Terminology like "Enter" is vague and lacks contextual meaning.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Replace "Match Successful" with "Match Successful" or "You are Matched".</li><li>Add a sentence that aligns with users' real-world expectations: "Your name is matched with 2 study buddies."</li><li>Replace "Enter" with "Join Room".</li></ul></div>	<div>3</div> <div>User Control and Freedom</div> <div>Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.</div> <div><ul style="list-style-type: none"><li>Does the design allow users to go back a step in the process?</li><li>Are exit links easily discoverable?</li><li>Can users easily cancel an action?</li><li>Is Undo and Redo supported?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>There is no way for the user to cancel or go back once the matching process has started.</li><li>No visible "Back" or "Home" navigation on the Matching screen.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Include a "Cancel Matching" button.</li><li>Add a persistent back/home icon or swipe-back gesture support.</li></ul></div>	<div>4</div> <div>Error Prevention</div> <div>Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Often, eliminate error-prone conditions, or check for them and prevent users with a confirmation option before they commit to the action.</div> <div><ul style="list-style-type: none"><li>Does the design prevent slips by using helpful constraints?</li><li>Does the design warn users before they perform risky actions?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>There is no confirmation screen or constraint before beginning the Match.</li><li>Users may accidentally tap "Quick Match" without understanding what will happen.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Provide a pop-up confirmation: "Are you ready to match now?"</li><li>Include a short tooltip on first-tap explaining "Quick Match" function.</li></ul></div>	<div>5</div> <div>Help Users Recognize, Diagnose, and Recover from Errors</div> <div>Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.</div> <div><ul style="list-style-type: none"><li>Does the design use traditional error message visuals, like bold, red text?</li><li>Does the design offer a solution that solves the error immediately?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>No error message shows when matching fails or times out.</li><li>No guidance provided if searching goes wrong (e.g., no network, no users).</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Implement a failure fallback: "No match found. Try again or switch to Advanced Match."</li><li>Use friendly error visuals (sad emoji, empty state illustrations) with retry options.</li></ul></div>	<div>6</div> <div>Recognition Rather Than Recall</div> <div>Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g., field labels or menu items) should be visible or easily retrievable when needed.</div> <div><ul style="list-style-type: none"><li>Does the design keep important information visible, so that users do not have to memorize it?</li><li>Does the design offer help in context?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>There is no visual summary of what the Quick Match process will do once the user taps the button.</li><li>The user has to remember what comes next.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Add a brief description below the "Quick Match" button: "Automatically connects you to study groups based on your time."</li><li>Use icons with labels to visually represent progress steps (e.g., Login &gt; Select &gt; Match &gt; ...).</li></ul></div>	<div>7</div> <div>Flexibility and Efficiency of Use</div> <div>Shortcuts — hidden from novice users — may speed up the interaction for the expert user such that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.</div> <div><ul style="list-style-type: none"><li>Does the design provide accelerators like keyboard shortcuts and touch gestures?</li><li>Is content and functionality personalized or customized for individual users?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>No shortcuts or user preferences available for returning users.</li><li>The process is identical every time, even if the user is familiar.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Add a "Skip to Match" or "1-click Quick Match" for returning users.</li><li>Allow users to set their preferred study mode and auto-apply it as future sessions.</li></ul></div>	<div>8</div> <div>Aesthetic and Minimalist Design</div> <div>Interfaces should not contain information that is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility.</div> <div><ul style="list-style-type: none"><li>Is the visual design and content focused on the essentials?</li><li>Have all distracting, unnecessary elements been removed?</li></ul></div>	<div>Issues</div> <div><ul style="list-style-type: none"><li>The "Match Successful" text has a green fill with thick black outline that is visually heavy.</li><li>Text size is disproportionately large.</li></ul></div>	<div>Recommendations</div> <div><ul style="list-style-type: none"><li>Use moderns flat typography without outlines.</li><li>Maximize hierarchy using font weight and spacing, not just size or stroke.</li><li>Reduce text size and align with overall minimalist visual identity.</li></ul></div>
--	--	--	---	---	---	--	--	--	--	---	--	---	--	--	--	--	--	--	---	---	---	---	--

These complementary approaches helped us identify strengths and areas for improvement in our interface design

summary of Heuristic evaluation :

Study Room Matcher - Usability Evaluation Summary

Heuristic	Issues Found	Modifications Made	Future Improvements
1. Visibility of System Status	No feedback during matching process	Added "please wait, matching" phrase to provide real-time feedback	Add visual loading indicators and estimated time counters
2. Match Between System and Real World	- Unnatural phrases like "Match Succeed" - Confusing labels ("Enter", "Focus")	- Changed to "Match Successful" - Renamed "Enter" to "Join Room" - Changed "Focus" to "Current Focus" - Changed "Study Days" to "Total Study Days"	Continue reviewing terminology for intuitive understanding
3. User Control and Freedom	- No cancel/back/home buttons - No way to exit a process once started	- Added "Back" button for step backtracking - Added "Home" button on Friend page - Added "Back" button for matching process	Add confirmation dialogs before critical actions
4. Consistency and Standards	- Inconsistent icon and button styles - Varying terminology ("Create Room" vs "Create Study Room")	- Changed font and frame style to rounded - Standardized terminology to "Create Your Study Room"	Create a design system with consistent UI components
5. Error Prevention	- No confirmation before Quick Match - No limits or warnings for tag over-selection	Added "Back" button for accidental match cancellation	Implement confirmation pop-ups and tooltips for first-time users
6. Recognition Rather Than Recall	- Selected tags hard to distinguish - App doesn't remember previous selections	Enhanced visibility of selected tags with better layout and formatting	- Add descriptive button labels - Implement visual progress indicators - Save user preferences between sessions
7. Flexibility and Efficiency of Use	- No shortcuts for returning users - Same process every time	No current modifications	Allow users to set preferred study mode that auto-applies in future sessions
8. Aesthetic and Minimalist Design	- Bold tags and outlined text create visual clutter - "Match Succeed" visual too heavy	Lightened "Match Successful" logo style for better visual comfort	Further refine visual hierarchy and reduce unnecessary elements
9. Help Users Recognize, Diagnose, and Recover from Errors	- No error messages if matching fails - No retrv or fallback options	Added "Back" button in wait page for process cancellation	Implement error messages with suggested actions
10. Help and Documentation	- No onboarding for new users - No explanations for buttons/features	Added explanation page for new users	Implement contextual help tooltips and first-time user prompt windows

Quick Match performed best with SUS scores ranging from 93-98, while Create Room scored lowest at 78-88. Common issues included difficulty finding back buttons, confusion with tag selection, and uncertainty about what happens after matching. Participants particularly appreciated the customization options in Advanced Match, finding them more meaningful and tailored compared to Quick Match



# Evaluation Strategy 2

## 1. Key Findings Overview:

- Average SUS score of 90+ for Quick Match feature
- Strong task completion rates (all users completed tasks)
- Identified usability issues primarily in navigation and feedback

Research Question	Findings	Conclusion
Does customization improve satisfaction?	<ul style="list-style-type: none"><li>- All participants completed advanced matching</li><li>- All reported feeling more control with customization</li><li>- Average SUS scores &gt;80 for all features</li><li>- P1: "More confident once I added preference restrictions"</li><li>- P3: "Definitely more than Quick Match" (re: control)</li></ul>	Customization features enhanced perceived match quality and satisfaction, though navigation improvements are still needed
How do interface clarity and feedback affect efficiency?	<ul style="list-style-type: none"><li>- All participants had navigation difficulties</li><li>- Missing visual cues caused uncertainty</li><li>- Users wanted to see study buddy count before entering</li><li>- Selected/unselected tags hard to differentiate</li><li>- P3: "The tags below don't have difference" after selection</li></ul>	Lack of visual differentiation and missing navigation controls increased task time and errors. Users expected more confirmation and system status visibility.
Can users navigate tasks without guidance?	<ul style="list-style-type: none"><li>- All participants needed at least one clarifying question</li><li>- Frequent pauses during page transitions</li><li>- Observed hesitations, backtracking, unclear mental models</li><li>- Users could figure out next steps with small hints</li></ul>	Current navigation flow not intuitive enough for independent task completion. Prototype needs better guidance for self-guided usage.

# Study Room Matcher - User Testing Summary

Participant	Task	Completion	Errors	Time (s)	SUS Score	Key Observations
P1 Data Scientist 26 years old Male College student	Quick Match	✓	1	35	95	- Wanted to quit but couldn't find button - Wanted to know number of study buddies before entering
	Create Room	✓	3	52	81	- Selected too many tags without realizing limits - Couldn't differentiate selected tags (font/color issue) - Hesitated when selecting tags
	Advanced Match	✓	2	48	90	- Wanted to switch to quick match but no button - Asked about difference between match types - Felt more confident with preference restrictions
P2 Data Analyst 26 years old Female College student	Quick Match	✓	1	47	98	- Unsure what to do after match button - Felt study room didn't know them, "would not stay"
	Create Room	✓	5	62	78	- Not sure if BGM items were labels - Wanted more customization options
	Advanced Match	✓	3	61	89	- Lost in middle where users choose quick match/create room - Liked the tags with study information - Felt it was "more meaningful"
P3 Software Engineer 30 years old Male Professional engineer worker	Quick Match	✓	2	40	93	- Could not find visible back button - Confused by automatic match with no loading indicator - Expected to see profiles or who they matched with
	Create Room	✓	3	60	88	- Confused about customized yellow tag bar - Expected more customization (time setting, room naming)
	Advanced Match	✓	2	55	90	- Could not find back button - "Enter" button was confusing - Selected BGM tags didn't show visible difference - Liked setting filters, felt "more tailored"

# Remaining Usability Issues

## Next Steps for Improvement

Based on our evaluation results, we plan to implement the following improvements:

1. **Enhance System Feedback:**
  - Add visual **loading indicators and estimated dynamic wait times**
2. **Improve User Control:**
  - Implement confirmation dialogs for critical actions
  - Add consistent navigation controls (back, home buttons) across all pages
3. **Increase Recognition:**
  - Enhance visual difference between selected/unselected tags
4. **Enhance Flexibility:**
  - Allow users to **set preferred study mode that auto-applies**
  - Add **shortcuts** for returning users
5. **Provide Help System:**
  - Implement contextual help tooltips
  - Add **onboarding prompts** for first-time users

# Reflection

## Prototype Scope and Features

What we could have done differently:

- **Feature prioritization:** Rather than implementing all features at once, we could have better prioritized features based on user needs. For example, testing the basic matching functionality thoroughly before adding customization options.

## Prototype Techniques

Alternative approaches we could have explored:

- **Paper prototyping for early conceptual validation:** While we did use paper prototypes, we could have employed them more extensively for rapid iteration before moving to digital prototypes. Probably we will iterate more version of the paper prototype.
  - **Interactive scenario-based prototypes:** Creating scenario-specific prototypes rather than a comprehensive app would have allowed deeper testing of specific use cases.
-

# Reflection

## Evaluation Methods

How we could have improved our evaluation approach:

- **Expand participant diversity:** Our testing pool (n=3) was limited to highly educated, tech-savvy users. Including participants with varied technical backgrounds would have provided more comprehensive insights.
- **Contextual inquiry:** Observing how users currently study virtually would have provided valuable insights into real-world behaviors that our prototype could address.
- **Comparative testing:** Testing our prototype against existing solutions (like Discord or Zoom study rooms) would have highlighted competitive advantages and disadvantages, and also help us to improve our product.

## Research Design

Improvements to our research approach:

- **Mixed methods approach:** Combining qualitative feedback with quantitative metrics like eye-tracking or click path analysis would have provided more objective data.
  - **Iterative testing cycles:** Rather than a single evaluation phase, multiple short test-revise-test cycles would have yielded more refined results.
-

# Theories & Challenges

**Familiar Icons:** Use of well-known symbols for ease of use.

Reversed Arrow = Back

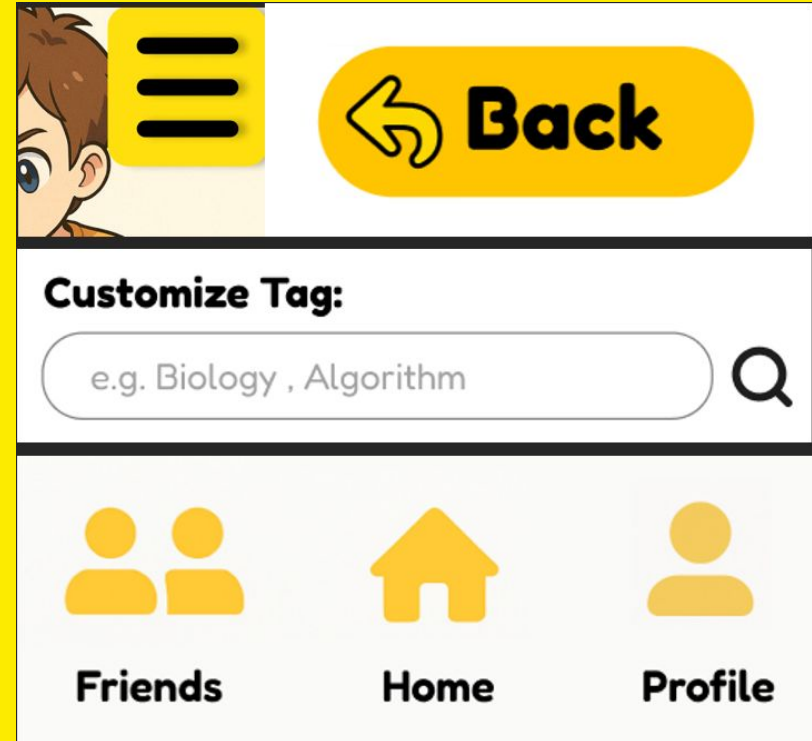
Three Bars = Menu

House = Home Page

Person = Profile

Two People = Friends

Magnifying Glass = Search



# Theories & Challenges

## **Visual Consistency & Brand Recognition:**

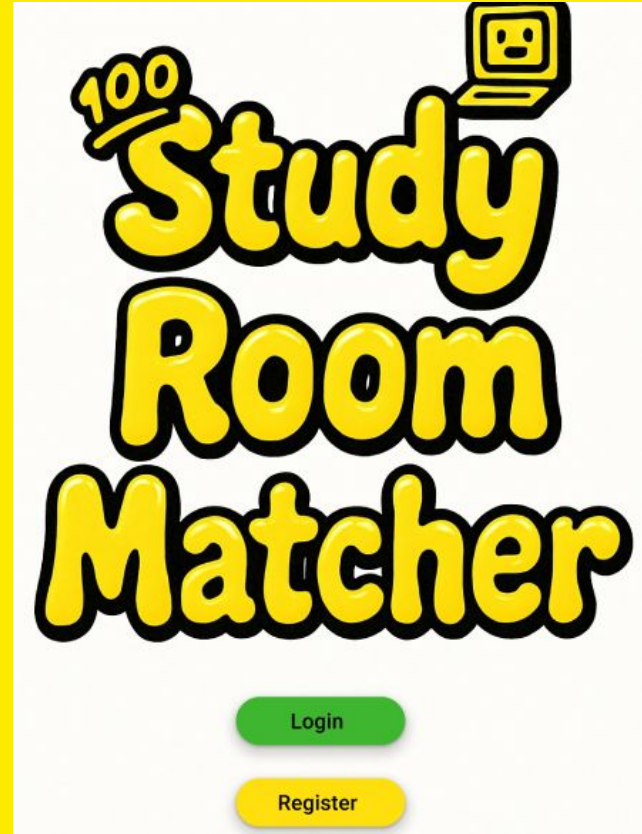
Yellow reinforces brand identity.

## **Positive & Energetic:**

Yellow evokes a cheerful, lively feeling.

## **Enhances User Experience:**

Ideal for creating a positive emotional connection.



# Theories & Challenges

## **Simplified Home Page:**

3 options and 3 buttons for easy navigation.

## **User-Friendly Design:**

Focus on simplicity for quicker, intuitive usage.

## **Enhanced Experience:**

Less complexity, more ease of use.

Hello “👋” Mark!

Today you want to...

Create Your  
Study Room

Quick Match

Advanced Match



Friends



Home



Profile



# Theories & Challenges

**7 ± 2 Information Limit:**  
Only 7 options presented at once for easy processing.

**Simplified Interface:**  
Key features like subject, music, and room length.

**Enhanced Usability:**  
Intuitive, user-friendly design with minimal clutter.

[↩ Back](#)

### Advanced Match

Your current Preference (3/5)  
(\* you can choose **maximum 5 tags** total)

History

Math

Piano

**Study Room Subject:**

Economics

History

English

Physics

Coding

Math

**Study Room Music Theme:**

☐ Quiet

☒ BGM ON

Pop

Piano

White noise

classical

**Study Room Length:**

-

00:40

+

**Customize Tag:**

Q

Let's Match!

# Theories & Challenges

## **Back Button Navigation:**

Enhances user flow and accessibility.

## **Clear Prompts & Confirmation:**

Prepares users mentally before entering the room.

## **User-Centered Design:**

Focus on smooth and confident user experience.



# Q&A: We Need Your Feedback!

## Design Approach

- Does our matching approach with both Quick Match and Advanced Match options make sense for study environments? Would you prefer a different balance between simplicity and customization?
- What are your thoughts on our prioritization of navigation improvements (Back/Home buttons) over visual refinements?

## Feature Extensions

- Which additional features would most enhance your study experience: note-sharing, flashcard integration, session scheduling, or accountability check-ins?
- For our planned user preference saving feature, what specific preferences would be most valuable to have auto-applied in future sessions?

## Implementation Concerns

- Our user testing revealed concerns about privacy and wanting to know who they're matched with. What level of user profile visibility would you expect before joining a study room?
- We've prioritized improving tag selection visibility in our future improvements. Would color-coding by subject area or a tag organization system be more helpful?

## Experience Personalization

- Our test participants expressed interest in more customization options. Beyond subject, BGM, and duration, what other study environment factors would you want to customize?
- How important is the ability to name or personalize your study room compared to other features?

## THE TEAM

### Jieyao Chen



#### Role

Primary: UI/UX Design & Prototyping  
Secondary: Usability Evaluation & User Testing

### Zhaoqi Gao



#### Role

Primary: Project Management & Documentation  
Secondary: UI/UX Design Support & Quality Assurance

### Yuqian Tan



#### Role

Primary: Usability Evaluation & User Testing  
Secondary: Documentation & Results Analysis

# Professor

Megan Hofmann  
[m.hofmann@northeastern.edu]

# Team member

Jieyao Chen, chen.jieyao@northeastern.edu  
Yuqian Tan, tan.yuq@northeastern.edu  
Zhaoqi Gao, gao.zhaoq@northeastern.edu

# Thank You

# Problem Proposed Solution: A Virtual Study Room Matcher

## Core Features

- **Search & Filter:** Users specify criteria (subject area, background music preferences, group size, etc.).
- **Matching Algorithm:** Automated suggestions for virtual rooms that match the user's preferences (e.g., "Lofi Music & Calculus," "Classical Music & Literature").
- **Room Creation:** Option to create a new room with custom settings (e.g., invite link, designated quiet times, shared Google Docs/Notion space).

## Interface Highlights

- A **dashboard** with recommended rooms based on user profile.
- **Room tags** to quickly see the vibe or subject (e.g., #Pomodoro, #ExamPrep, #MusicOn).
- **Real-time** occupancy and chat/voice integration.

# Logistics

## Resources Needed

Collaboration tools (Interface: Figma for design and build the prototype, analysis: Usability Evaluation)

## Target Audience Access

We will recruit 5 volunteer college students (2 from Computer Science, 3 from Business) who regularly use virtual study groups to evaluate our prototype

## Team Roles & Skills

Our team member Jieyao is responsible for UI/UX Design & Prototyping, Zhaoqi is responsible for Project Management & Documentation, Yuqian is responsible for Usability Evaluation & User Testing