Project Title: Study Room Matcher

Team Members Info

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Study Protocol

Consent Script (Before Starting)

"Hello, and thank you for participating in our user testing session today. Before we begin, I'd like to explain what we're doing and get your consent to participate.

We are testing a paper prototype for an app called "Study Room Matcher" that helps users find virtual study rooms. We want to emphasize that we are testing the prototype, not you. There are no wrong actions or responses.

During this session:

- You'll be asked to complete 3 tasks using our paper prototype
- We'll ask you to think aloud while completing these tasks
- We would like to record video of your hands interacting with the prototype (not your face)
- The session will take approximately 20-30 minutes

This testing is completely voluntary. You can stop at any time for any reason without penalty. Your personal information will remain confidential - we will only collect demographic information like age, education level, and occupation, but no identifying details.

The data collected will only be used for improving our design and for academic purposes related to this project.

Do you have any questions about the process? Do you consent to participate in this user testing session? Do you consent to video recording of your hands interacting with our prototype?"

[Wait for verbal consent before proceeding]

User Briefing (After Consent)

"Great, thank you for your consent. Now, let me introduce you to our app.

StudyRoom Matcher is designed to help users quickly and easily find virtual study rooms that match their academic and environmental preferences. Whether you're a student preparing for exams, a professional upskilling, or just looking for a quiet, focused environment, the app helps you connect with others who want the same study atmosphere.

You'll be given a series of tasks that simulate how someone might use our app. As you go through the tasks, please say your thoughts out loud - anything that comes to mind about what you're seeing, what you expect to happen, and any confusion or questions you have.

Remember, we're testing the prototype, not you. Your honest feedback will help us improve the design.

Do you have any questions before we begin the first task?"

Research Statement

We aim to understand whether providing customizable study preferences enhances users' ability to find suitable virtual study partners, and how UI design impacts engagement, clarity, and match satisfaction.

To narrow down the research statement, we proposed 3 questions for the research:

Research Question 1: Does allowing users to customize their study preferences (subject, environment, duration) improve satisfaction and matching outcomes?

Research Question 2: How does interface clarity and feedback (e.g., visual indicators, navigation buttons) affect task efficiency and error rates?

Research Question 3: Are users able to easily navigate through different tasks without guidance?

Hypothesis

If users can customize their study room preferences (e.g., subject, atmosphere, music), they will experience higher satisfaction, increased usability, and more successful matches compared to using default or random match systems.

Hypothesis 1: Users who are given the ability to customize their study preferences (e.g., subject, study environment, and session duration) will report higher satisfaction levels and

more successful match outcomes than users who receive randomly assigned or default matches.

Hypothesis 2: Interfaces that provide clear visual feedback (e.g., loading indicators, confirmation messages) and consistent navigation options (e.g., back/home buttons) will lead to faster task completion and fewer user errors compared to interfaces lacking these features.

Hypothesis 3: Users will be able to complete tasks with minimal assistance if the interface follows consistent patterns, uses intuitive labels, and provides visible cues, leading to higher independent task completion rates. And the time they finish each task should be less than 3 minutes.

Training Materials Provided to Users

Training Material

Testing Methodology

To test our research statement—that customizable study preferences and intuitive UI design improve virtual matching outcomes, task efficiency, and user satisfaction—we conducted a **user study** using a high-fidelity prototype of the Study Room Matcher.

Study Setup

- **Participants:** 3 users (Age range: 26–30, all technically proficient, graduate-level education)
- **Environment:** Remote or in-person testing using a paper or high-fidelity prototype
- **Format:** Moderated usability testing with observation, think-aloud protocol, and post-task survey

Procedure

1. **Consent & Briefing:** Each participant received a combined consent and briefing script before beginning.

2. **Scenario-Based Tasks:** Participants were asked to complete the following tasks using the prototype:

    - Quick Match a Study Room
    - Create your Study Room
    - Advanced Match with Extra Preferences

3. **Think-Aloud Protocol:** Participants were instructed to verbalize their thoughts as they interacted with the system.

4. **Observation:** The moderator documented errors, confusion, hesitations, and navigation issues.

5. **Post-Task Survey & Interview:** Participants provided feedback on their experience, including perceived usability, satisfaction, and match quality.

Measures Collected

Quantitative Measures

1. **Task Completion Rate:** Whether users successfully completed the customization and matching flow.
    - **Rationale:** A higher completion rate indicates users understood and could utilize preference-based matching.
    - **Success Criterion: ≥90%** of users complete the task.

2. **Time on Task:** The time it took to complete each task (e.g., Create Room, Quick Match).
    - **Rationale***:* Longer task times may suggest confusion, poor labeling, or missing feedback (e.g., no loading indicator).
    - **Success Criterion**: **≥90%** of users complete the task within **2 minutes.**

3. **Error Count:** Number of observed misclicks, hesitations, questions, or backtracking.
    - **Rationale***:* Indicates usability breakdowns due to poor interface feedback, lack of control, or ambiguous wording.
    - **Success Criterion: ≥90%** of users complete the task less than making **3 mistakes.**

4. **System Usability Scale (SUS) Score:** Users shall rate their overall satisfaction with the matching process at **≥80/100** on the System Usability Scale (SUS).

- **Rationale:** Administer the **8-item** SUS questionnaire post-task. Provides a standardized, holistic measure of perceived usability.
- **Success Criterion**: Average **SUS score ≥8**0 (considered "excellent" usability).

Qualitative Measures

1. **User Satisfaction Ratings (Post-task Interview):** Verbal responses to questions like “Was this match what you expected?” or “Did the preferences feel useful?”
    - **Rationale***:* Helps determine whether users felt the customization improved their experience.

2. **Qualitative Feedback (Think-Aloud):** Comments on ease or frustration during selection of tags, atmosphere, or custom options.
    - **Rationale***:* Reveals whether the customization process is intuitive and effective.

Quantitative and Qualitative Data Collected

Demographics

interviewer 1(Yuqian):

Time: April 15th, 2025

Place: interviewee’s home

Equipment: Camera, pens, paper, high-fidelity prototype

Participant Profile1

- **Age:** 26 years old
- **Gender:** Male
- **Technical proficiency levels**: confident
- **Educational background:** Master's
- **Occupation/field**: Data Scientist

Interviewer2(Zhaoqi):

Time: April 17th, 2025

Place: Living room

Equipment: Camera, pens, paper, high-fidelity prototype

Participant Profile2

- **Age:** 26 years old
- **Gender: Female**
- **Technical proficiency levels**: confident
- **Educational background:** Master's
- **Occupation/field**: Data Analyst

Interviewer3(Jieyao)

Time: April 16th, 2025

Place: interviewee's home

Equipment: iPhone, pens, paper,high-fidelity prototype

Participant Profile3

- **Age: 30** years old
- **Gender: Male**
- **Technical proficiency levels**: confident
- **Educational background: Master's**
- **Occupation/field**: software engineer

Table: Qualitative and Quantitative Data

Participant	Task	Completion	Errors	Time(s)	Average System Usability Scale (SUS) Score	Observation
P1 (Data Scientist, 26)	Quick Match	Completed	1	35	95	- Wanted to quit the quick match but couldn't find the button
	Create Room	Completed	3	52	81	- Selected too many tags without realize the limits

						- Couldn’t differentiate what tags have been selected because of the font and color of the tag - Hesitated when selected the tags
	Advanced Match	Completed	2	48	90	- Wanted to change to quick match in the middle, but there was no button for this function - Asked about the difference between advanced match and quick match
P2 (Data Analyst, 26)	Quick Match	Completed	1	47	98	unsure what to do after the match button
	Create Room	Completed	5	62	78	was not sure that bgm were not labels
	Advanced Match	Completed	3	61	89	lossed in the middel were user can choose to quick match or create room
P3(Softwar Engineer, 30)	QuickMatch	Completed	2	40	93	-Can not find the visible button to go back
	Create Room	Completed	3	60	88	-Confused about the customised yellow tag bar
	Advanced Match	Completed	2	55	90	Can not find the go back button,

						and,after match successful , Enter button was confusing

Interview Script(User Satisfaction & Expectations):

Participant 1

Task	Question Type	Sample Question	Purpose	User Behaviors
Quick Match	Post-task Interview	"Was this match what you expected?"	Understand expectation vs. result	"I didn't expect the quick match would be that convenient, I like the function."
	Think-Aloud Prompt	"Is anything confusing here?"	Spot interface pain points	"Hmm.. I want to know how many study buddies there are in the study room before I get in. Is there a way to know about it?"
Advanced Match	Post-task Interview	"Did the preferences help you?"	Evaluate customization effectiveness	"I think the preferences selection definitely helped me because I selected the advanced match for extra needs. Especially I want to change the subject to study when I get a new study room."
	Post-task Interview	"Do you feel more control of who you would match with?"	Evaluate customization effectiveness	"Sure.. I was more confident about the match result once I added more preference restrictions."
	Think-Aloud Prompt	"What do you think this does?"	Catch confusion before errors happen	"I think the advanced match helps me to increase the precision of the match based on my extra needs? Am I correct?"
Create your study	Think-Aloud Prompt	"Is this what you were expecting?"	Understand expectation vs. result	"Yes.. but I just hope there will be a button for me if I want to quit the

room				study room.”
	Post-task Interview	“Was it easy or difficult to complete the task?”	Spot the usability	“In general, I think it was pretty easy for me to create my own study room. I just hope that tags can be more prominent after I choose them. Sometimes I don’t remember which one I choose.”

Participant 2

Task	Question Type	Sample Question	Purpose	User Behaviors
Quick Match	Post-task Interview	“Was this match what you expected?”	Understand expectation vs. result	“So this is the study room? is a lot quicker than i thought ”
	Think-Aloud Prompt	“Is anything confusing here?”	Spot interface pain points	“Not really, i feel like this study room does not know me at all and probably would not stay.”
Advanced Match	Post-task Interview	“Did the preferences help you?”	Evaluate customization effectiveness	“Yes I like the tags give me more information about what I'm studying for ”
	Post-task Interview	“Do you feel more control of who you would match with?”	Evaluate customization effectiveness	“I like this one one it feels m0re meaning full ”
	Think-Aloud Prompt	“What do you think this does?”	Catch confusion before errors happen	“may be be more clear about what i can choose feel like the information are not that clear.”
Create your study	Think-Aloud Prompt	“Is this what you were expecting?”	Understand expectation vs. result	“yes but there should be more things i can

room				choose by creating a room”
	Post-task Interview	“Was it easy or difficult to complete the task?”	Spot the usability	“over all this part feel natural to me ”

Participant 3:

Task	Question Type	Sample Question	Purpose	User Behaviors
Quick Match	Post-task Interview	“Was this match what you expected?”	Understand expectation vs. result	“Wait… am I already matched? There’s no loading or something. It just kind of jumped to this screen.”
	Think-Aloud Prompt	“Is anything confusing here?”	Spot interface pain points	“Honestly, no. I expected to see some profiles or at least know who I’m matching with. It felt too automatic.”
Advanced Match	Post-task Interview	“Did the preferences help you?”	Evaluate customization effectiveness	“Yeah, they helped! I wanted to study for a specific exam, so I picked the subject and it matched me with people doing the same thing.”
	Post-task Interview	“Do you feel more control of who you would match with?”	Evaluate customization effectiveness	“Definitely more than Quick Match. I like being able to set filters—it felt more tailored.”
	Think-Aloud Prompt	“What do you think this does?”	Catch confusion before errors happen	“Maybe it lets me choose more specific stuff… like the subject or how many people I want in a room?” “And also the BGM on

				and quiet, these two button,after being selected, the tags below don't have difference."
Create your study room	Think-Aloud Prompt	"Is this what you were expecting?"	Understand expectation vs. result	"Mostly, yeah. I thought there'd be more customization though, like setting a time or naming the room."
	Post-task Interview	"Was it easy or difficult to complete the task?"	Spot the usability	"Pretty easy, but I think the interface could be a little clearer, and also when I entered the room, the room do not have any other infos for me: music type, how many time remaining, the preference that I set before"

Results

Research Question 1: Does allowing users to customize their study preferences (subject, environment, duration) improve satisfaction and matching outcomes?

Findings:

- All participants successfully completed the advanced matching and reported that customization helped them feel more in control of who they were matched with.
- One participant said, "It's nice that I could pick music or no music—otherwise I'd probably get a match I couldn't focus on."
- All participants scored average SUS >80, which means the system design for advanced matches was "excellent".

Conclusion: Customization features enhanced the perceived match quality and contributed to higher satisfaction. However, participants mentioned that there are still rooms to improve the error handling system(eg. add buttons to return to the home page or back to the last step).

Research Question 2: How does interface clarity and feedback (e.g., visual indicators, navigation buttons) affect task efficiency and error rates?

Findings:

- All participants hesitated or asked for missing navigation elements (no back/home/confirm buttons) led to repetitive clicks and occasional restarts.
- The absence of visual cues (like progress reminde) on the advanced matching caused uncertainty.
- Participants also wanted to know how many study buddies were in the matched study room before they entered.
- Some participants found it different to differentiate the selected tags and unselected tags because the color didn't change prominently.

Conclusion: Lack of differentiation colors of the tags and missing navigation controls back to the previous pages directly increased task time and errors. Participants expected confirmations and more visibility into system status.

Research Question 3: Are users able to easily navigate through different tasks without guidance?

Findings:

- No participant completed all tasks without asking at least one clarifying question.
- Users frequently paused when transitioning between pages (e.g., from "Create Room" to match preview), unsure of what step they were in. However, they were able to figure it out after a small hint.
- Observed behaviors included hesitations, backtracking, and unclear mental models of task flow.

Conclusion: The current navigation flow was not intuitive enough for users to complete tasks independently. The prototype lacked sufficient guidance to support self-guided usage.

Reflection on Study Validity

Strengths:

- Realistic tasks and moderately complex scenarios reflected actual app usage.

- Think-aloud protocol revealed rich, qualitative insights about decision-making and confusion.
- Multiple roles (student, engineer, analyst) provided diverse perspectives.

Limitations:

- Small sample size (n=3), all highly educated and tech-savvy—limits generalizability to broader student populations.
- Prototype did not include live system feedback, which may have impacted perception of responsiveness.

Suggestions for Improving the Study Method

- **Expand Participant Pool:** Include more users with varying tech literacy, education levels, and familiarity with study apps.
- **Include A/B Testing:** Compare customizable matching vs. random/default matching to directly test impact on satisfaction.
- **Add Pre-task Survey:** Collect baseline data on users' current study habits and preferences for richer context.

Suggestions for Improving the Study Method

Based on the findings, the next iteration of the prototype will include:

1. **Clearer System Feedback:**
    - Add "please wait" slogan to advanced match to show the matching is in processing
    - Show the amount of people in the matched room for the users before entering the room

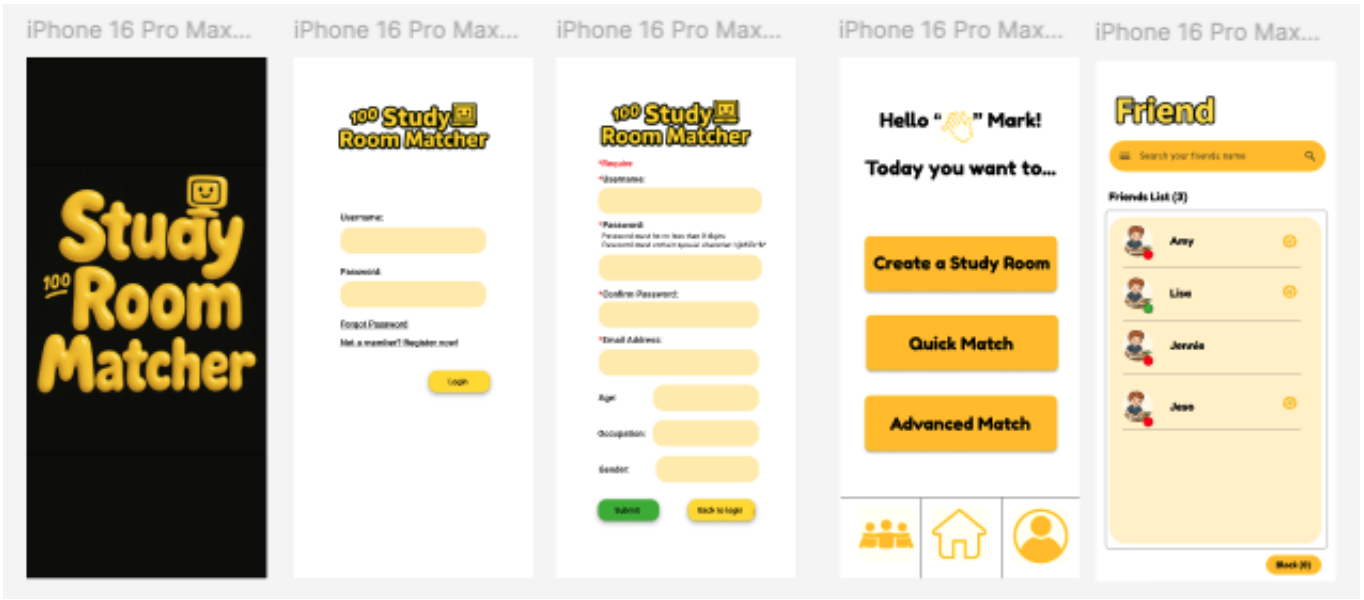
2. **Improved Navigation:**

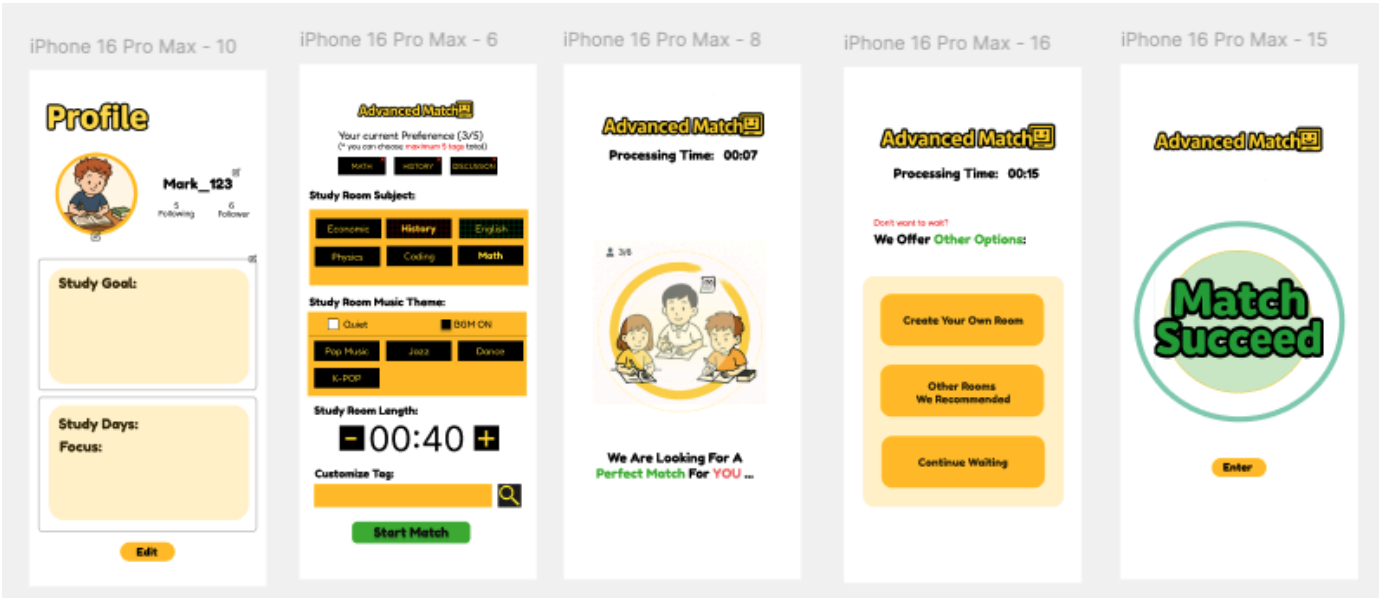
    - Add "Back", "Home" buttons to advanced match, quick match and create your study room feature pages
    - Introduce the "quick match" button to the advanced match feature page in case of users want to change to quick match feature while advanced match processing
    - Introduce the "advanced match" button to the quick match feature page in case of users want to change to the advanced match feature while quick match processing

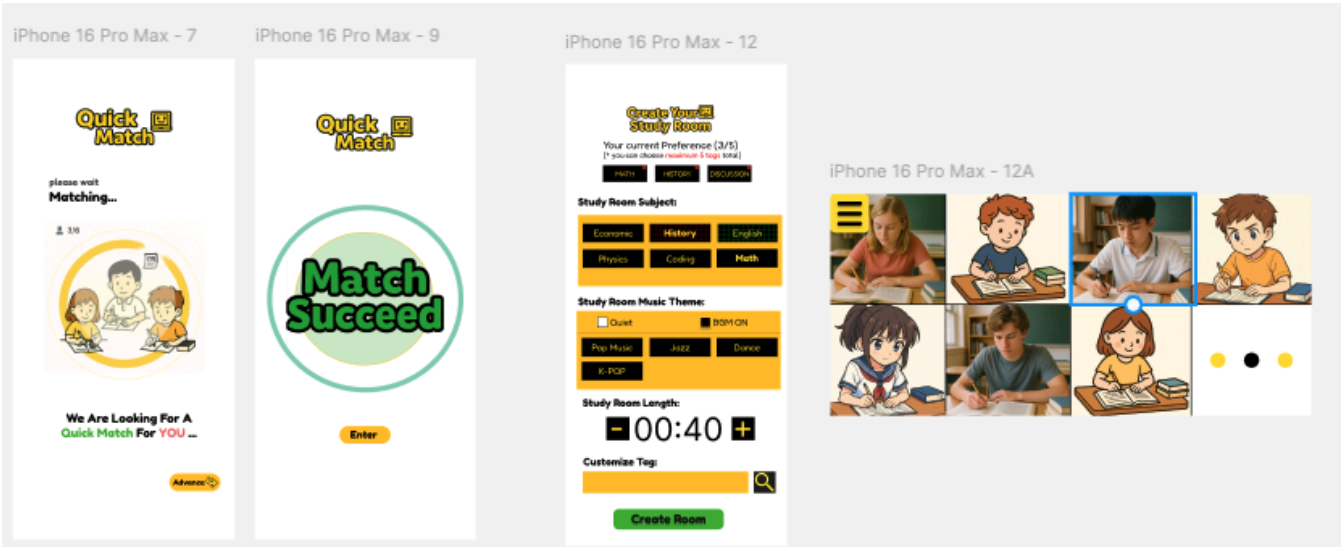
3. **Refined Language and Labels:**
    - Align all the create room tags to “create your study room” to eliminate the inconsistency
    - Clarify the “study days” to “total study days” in the profile page
    - Clarify the “focus” to “current focus” in the profile page
    - Change the "Match Succeed" to more natural phrases like “Match Successful”
    - Change the “Enter” button to “Join Room” button
    - Add a phrase of “Congrats” after match succeed

4. **Modified the color match to reduce confusion**
    - Only highlight the selected tag as yellow, the unselected tags remain light green
    - Remove the yellow background frame to make the page looks more clean

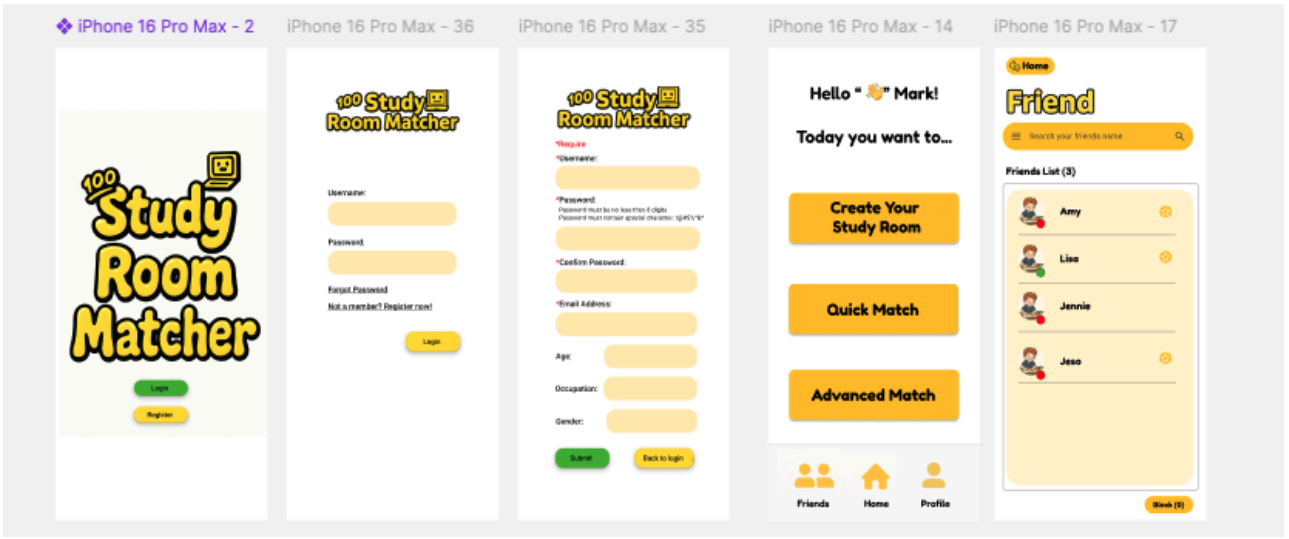
Appendix1 Original High-fidelity Prototype(before improving)

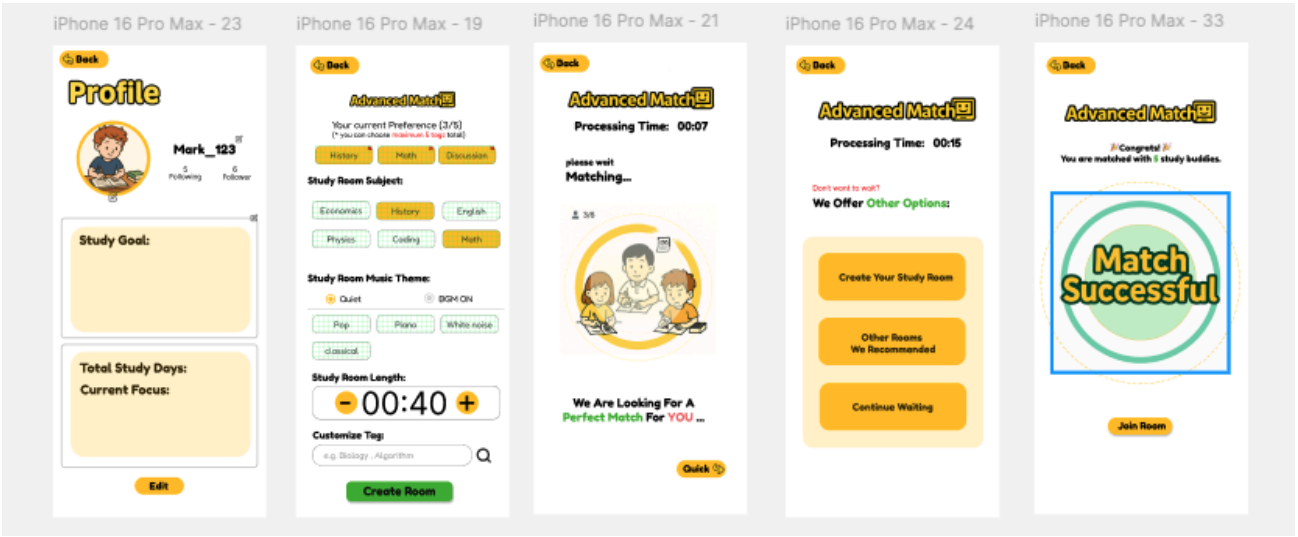


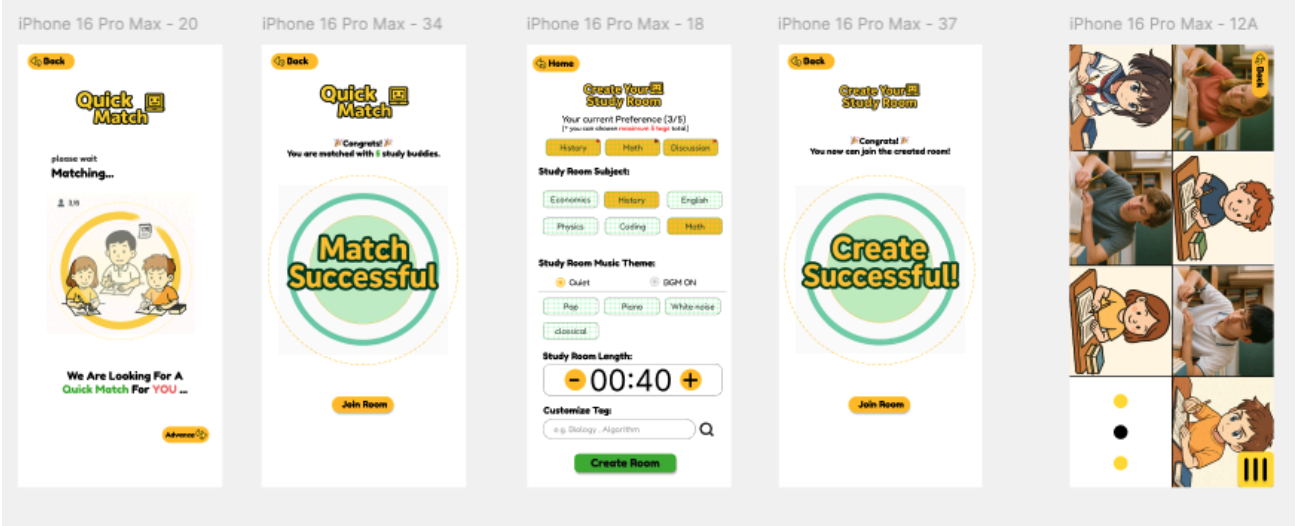




Appendix2 Revised High-fidelity Prototype(final version)







Appendix3 SUS Score Form – Study Room Matcher

Please indicate how strongly you agree or disagree with each of the following statements about your experience using the *Study Room Matcher* prototype. Use the scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

#	Statement	1	2	3	4	5
1	I think I would like to use this system frequently.	☐	☐	☐	☐	☐
2	I found the system unnecessarily complex. *(R)*	☐	☐	☐	☐	☐
3	I thought the system was easy to use.	☐	☐	☐	☐	☐
4	I think I would need the support of a technical person to use this system. *(R)*	☐	☐	☐	☐	☐
5	I felt confident using the system.	☐	☐	☐	☐	☐
6	I found the system unnecessarily inconsistent. *(R)*	☐	☐	☐	☐	☐
7	I felt the system's features were well integrated.	☐	☐	☐	☐	☐

8	I needed to learn a lot of things before I could get going with this system. *(R)*	☐	☐	☐	☐	☐

Instructions for Scoring:

- Reverse the score for negatively worded items marked *(R)* (i.e., 5 becomes 1, 4 becomes 2, etc.).
- Sum all the item scores and multiply by 2.5 to get a usability score out of 100.