Responsible Use of AI for Education: Collaborative Learning with AI
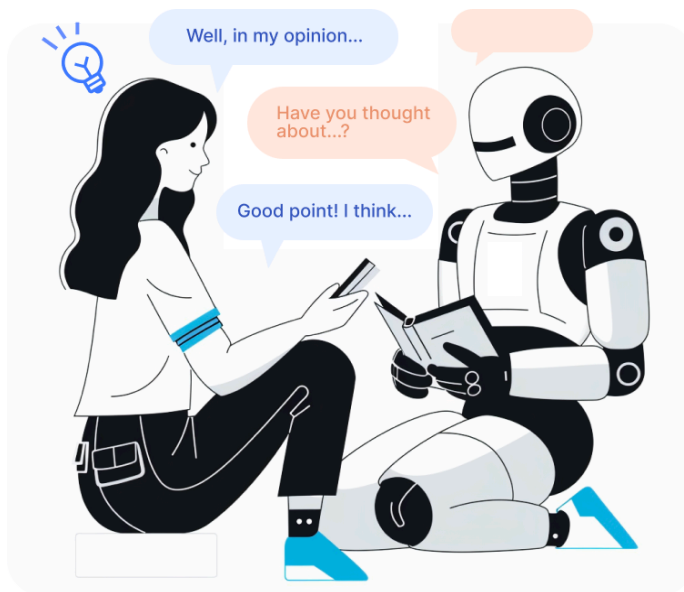
Research for Design

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Project Overview

Problem Framing

- AI assistance can significantly improve student's learning outcomes. However, once the AI assistant is removed, the student's outcome declines. Students tend to rely on, rather than learn from, AI.
- **How Might We design an AI tool that assists student's design learning without undermining students' agency in the long run?**

Key Research Insights

- **Collaborative learning with AI**
  In collaborative learning settings, AI can serve as a teammate, providing feedback and resources to student learn as if they work together on projects or assignments. AI encourages students to reflect on their experiences and questions the status quo, helping students develop critical thinking skills and deeper understanding of the material.
- **By combining collaborative learning and AI-assisted learning, students can use AI as their study-buddy and help them better understand study materials and critical thinking.**
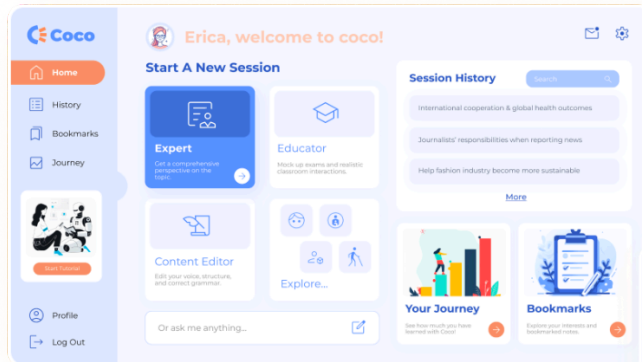
Design Activities

- **User interviews:** I conducted several interviews with students who are from both the first and second year of the HCI/d program. The interviews touch on their learning experiences and the use of AI for learning purposes.
- **Design workshop:** I conducted a observation session and workshop with a group students in the Intro to HCI class. The session lasted for around 2 hours. The workshop is about 40 mins, each student was given 8 minutes to brainstorm 8 ideas, and present them with their teammates.
- **User testing & iteration:** I conducted several rounds of design sketching and user testing, and iterated my design solutions based on the feedback received. I have also received feedback from the in-class gallery walks. Throughout the two-semester process, I've shifted my project focus while continue developing my design solutions.
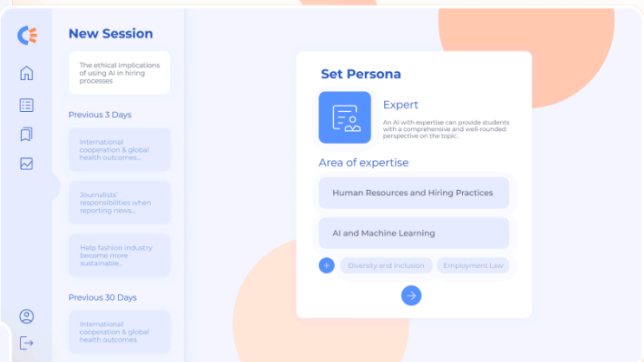
Final Solution Preview

Coco is a AI-powered chatbot that leverages the concept of collaborative learning and is designed to foster critical thinking in students as they engage in conversations with its AI personas.
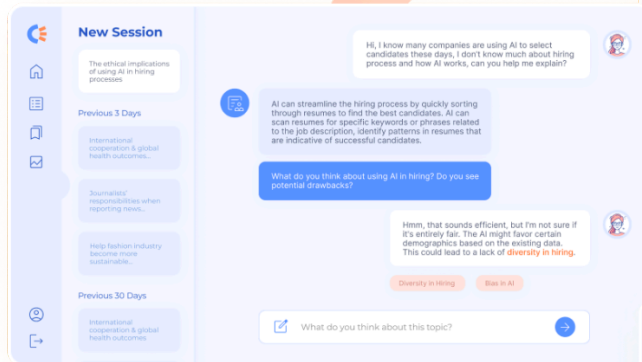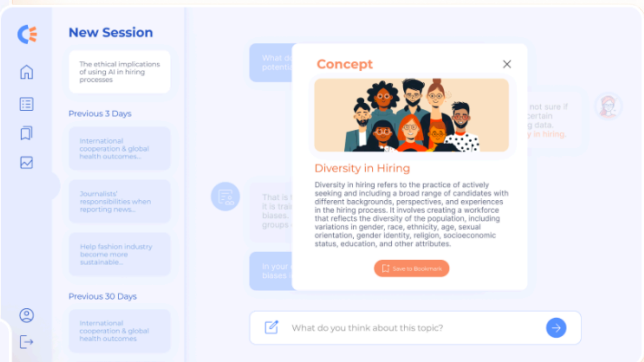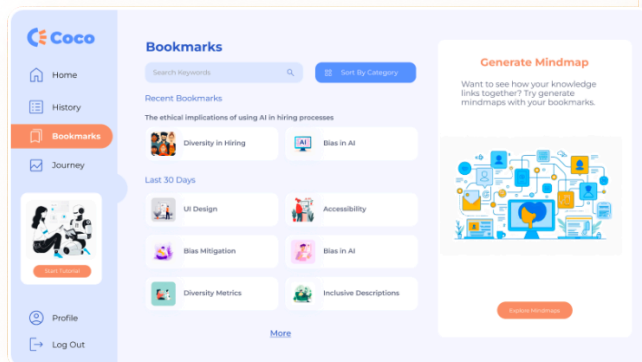[Figma Link](#)

Homepage

Coco

Home
History
Bookmarks
Journey

Start Tutorial

Profile
Log Out

Erica, welcome to coco!

Start A New Session

Expert
Get a comprehensive perspective on the topic.

Educator
Mock up exams and realistic classroom interactions.

Content Editor
Edit your voice, structure, and correct grammar.

Explore...

Or ask me anything...

Your Journey
See how much you have learned with Coco!

Bookmarks
Explore your interests and bookmarked notes.

Session History

International cooperation & global health outcomes

Journalists' responsibilities when reporting news

Help fashion industry become more sustainable

More

Persona

New Session

The ethical implications of using AI in hiring processes

Previous 3 Days

International cooperation & global health outcomes...

Journalists' responsibilities when reporting news...

Help fashion industry become more sustainable...

Previous 30 Days

International cooperation & global health outcomes...

Set Persona

Expert
An AI with expertise can provide students with a comprehensive and well rounded perspective on the topic.

Area of expertise

Human Resources and Hiring Practices

AI and Machine Learning

Diversity and Inclusion   Employment Law

Critical Thinking

New Session

The ethical implications of using AI in hiring processes

Previous 3 Days

International cooperation & global health outcomes...

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Previous 30 Days

International cooperation & global health outcomes...

Hi, I know many companies are using AI to select candidates these days, I don't know much about hiring process and how AI works, can you help me explain?

AI can streamline the hiring process by quickly sorting through resumes to find the best candidates. AI can scan resumes for specific keywords or phrases related to the job description, identify patterns in resumes that are indicative of successful candidates.

What do you think about using AI in hiring? Do you see potential drawbacks?

Hmm, that sounds efficient, but I'm not sure if it's entirely fair. The AI might favor certain demographics based on the existing data. This could lead to a lack of diversity in hiring.

Diversity in Hiring   Bias in AI

What do you think about this topic?

That is true! AI can unintentionally perpetuate biases if it is trained on historical data that reflects existing biases. This can lead to discrimination against certain groups of candidates.

In your opinion, how could companies address these biases in their AI systems?

Discovery

New Session

The ethical implications of using AI in hiring processes

Previous 3 Days

International cooperation & global health outcomes...

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Concept

Diversity in Hiring

Diversity in hiring refers to the practice of actively seeking and including a broad range of candidates with different backgrounds, perspectives, and experiences in the hiring process. It involves creating a workforce that reflects the diversity of the population, including variations in gender, race, ethnicity, age, sexual orientation, gender identity, religion, socioeconomic status, education, and other attributes.

Save to Bookmark

What do you think about this topic?

Bookmarks

Coco

Home
History
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Start Tutorial

Profile
Log Out

Bookmarks

Search Keywords

Sort By Category

Recent Bookmarks

The ethical implications of using AI in hiring processes

Diversity in Hiring   Bias in AI

Last 30 Days

UI Design   Accessibility

Bias Mitigation   Bias in AI

Diversity Metrics   Inclusive Descriptions

More

Generate Mindmap

Want to see how your knowledge links together? Try generate mindmaps with your bookmarks.

Explore Mindmap

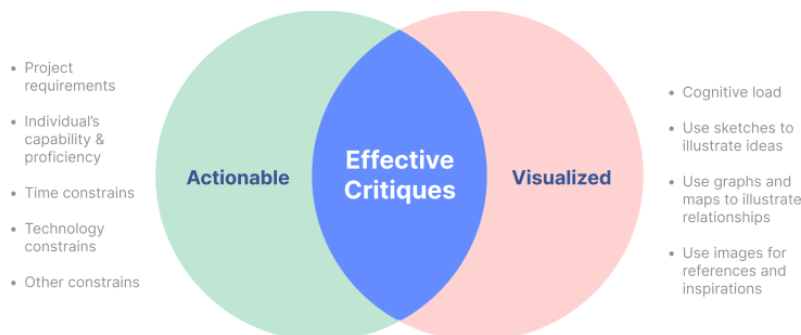# From Framing Problem to Design: A Iterative Process

The Design Challenge: Student Learning

- For my capstone project, I'm interested in helping students get better learning experiences and outcome leveraging technology. I started my journey focusing on students' experience learning in team settings, looking at how **collaboration and critiques** happens and how they impact student learning.
- **AI-assisted learning** later comes into the picture when I realize the potential of bringing the benefits students experience in team collaboration and critique into student-AI interactions. I researched how students current AI usage and create a AI-powered learning tool that learn with students collaboratively.

For the sake of clarity, this documentation only includes the key research insights that have impacts on design iterations and final design solution. For the complete research, please check the appendix for previous documentations.

Research on Student Collaboration & Critiques

- **Effective Critiques:** To be able to teach students about critiques, we first need to understand what counts as effective critiques. Based on my research, users favored visualization as the most effective means of conveying and comprehending feedback. They emphasized the importance of feasible, actionable feedback that fits their project constraints and time limitations.

  - Project requirements
  - Individual's capability & proficiency
  - Time constrains
  - Technology constrains
  - Other constrains

  Actionable **Effective Critiques** **Visualized**

  - Cognitive load
  - Use sketches to illustrate ideas
  - Use graphs and maps to illustrate relationships
  - Use images for references and inspirations

-

- **The Critique Experience in Collaboration:** Critique can also be a chance for students to learn, because whenever there's a disagreement, they are incentivized to investigate and conduct self-initiated research, which results in shared new knowledge across team.

Self-initiated research

Disagreement

Learn new ways of doing

Self-initiated research

Disagreement

- Following instructions
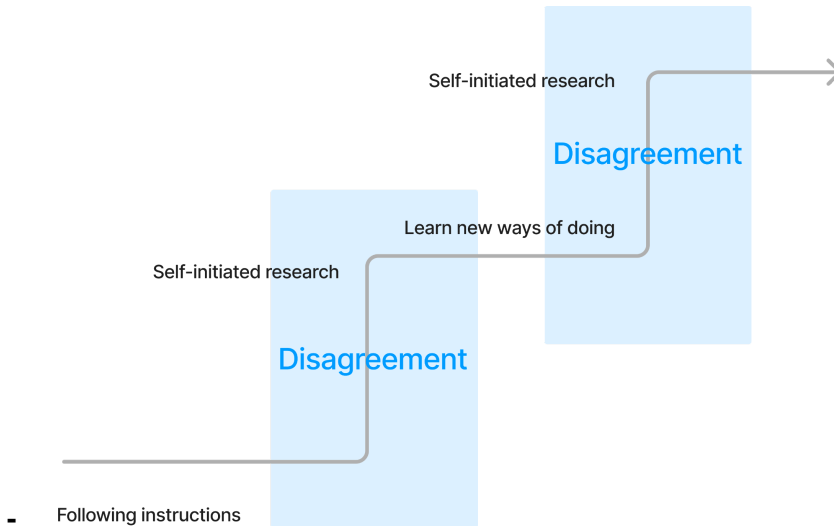
- **Cognitive apprenticeship** is an effective approach for teaching and acquiring knowledge with situated learning. We can apply this theory in various stages to facilitate student learning and collaboration. For instance, one and use modeling and coaching to provide effective feedback.

Instructor
Learner

Instructors provide examples
Learners observe and imitate

Modeling

Instructors provide guidance, feedback, and support

Coaching

Exploration

Learners explore and experiment, active learning

Cognitive Apprenticeship

Reflection

Learners analyze their own learning experiences & reflect

Articulation

Learners express their thought processes and reasoning out loud, verbalize their reflection

-

Design solution for student team collaboration

- **Building Trust with Your Peers:** John is an international student and just joined a new team in her Intro to HCI class. He's introverted and worried that he couldn't understand her teammates and won't make new friends. Luckily, Cohort has an onboarding feature to help him introduce herself to others, and also allows him to get to know his teammates better.

- **Learning How to Critique:** John doesn't have many design related experiences and he's worried that he doesn't know what to say about his teammates' work. With Cohort's critique onboarding feature and tone-check tooltips, he's able to give effective feedback with a little assistance.
- **Get Support When Needed:** John and his teammates couldn't agree on the design and wanted some help from the instructors and AIs. Normally, they need to email the teaching team and schedule an office hour meeting, but now they can do that smoothly on Cohort by requesting help on the team file.

Name Card

Peer Evaluation

Examples

Critique Tooltip

Request Review

Office Hours

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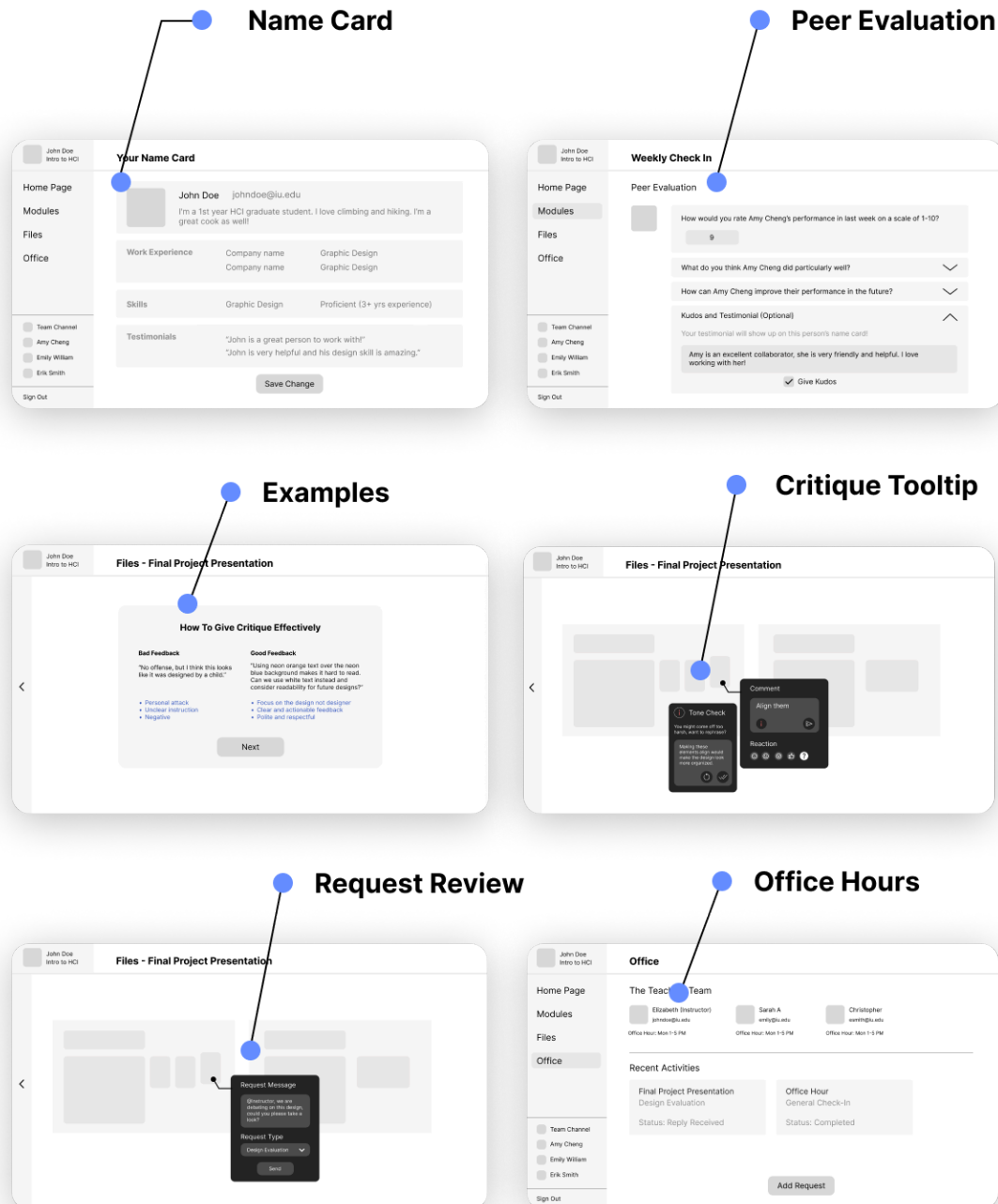
Shifting Focus: From Student Team Collaboration to AI Collaboration

Why I shifted my focus?
- **Feedback received on the solution:**
    - Trying to do too much but ended up not specific enough to solve the problem
    - Focusing too much on the features, not the overall experience
    - Solution is too general and replaceable
- **Team collaboration has little to do with technology**: The factors that influence team collaboration outcome include team members' personalities, cultural backgrounds, expectations on the final outcome, and many other factors that I'm unable to control. It might need a higher-level systematic approach, but my interest is to help students learn better, not a reformation of the education system.
- **Identified painpoints on AI-assisted learning**: I noticed the pervasive use of AI in students that I interviewed, and also observed the popular use among my peers, including myself. However, there's currently no good AI tool that are responsible. I started thinking:
    - **Can we incorporate the benefits of team collaboration and critique into AI-assisted learning?**

Research on AI-Assisted Student Learning:

- There are a few common types of use of AI among students: exploration, generating ideas, providing feedback, summarizing, and planning.
- **Pervasive use of AI in higher education:** AI is now widely utilized by students across various aspects of their learning activities, and its usefulness is undeniable. Students have adopted AI assistant tools in diverse formats to help them learn, such as seeking ideas, finding references, and generating content. These seemingly all-capable AI tools have significantly facilitated their learning processes like never before.
- **Negative impact of AI on student's learning:** However, unchecked usage of AI can potentially diminish students' learning abilities and agency. Research indicates that poorly designed AI assistant tools not only result in excessive reliance on AI for simple tasks but also undermine students' agency and motivation to learn in the long run. Therefore, developing AI tools to support students' learning must carefully consider the complexity of this issue.
- **Student-AI interaction - Collaborative Learning with AI:** After receiving feedback from the gallery walk, I realized that this project needs to be pivoted to researching and developing an overarching framework for the responsible use of AI in education. I was confined by the existing AI tools that always provide answers to questions, but

overlooked the essence of higher learning is not to get questions answered, but to think critically and question the established norm.

Design solution for AI-assisted learning

- **Adaptive Learning & personalization:** AI adapt to students' learning habits, create a customize learning experience that best suits the student's interest and ability to learn.
- **Critical Thinking & Feedbacks:** Encourages students to ask critical questions, and challenge the status quo. Provides feedback from various perspectives and discuss with students in a meaningful way.
- **Continuous Learning & exploration:** Provide personalized content recommendations based on the student's learning goals, preferences, and performance data, assisting student's long-term learning goal.

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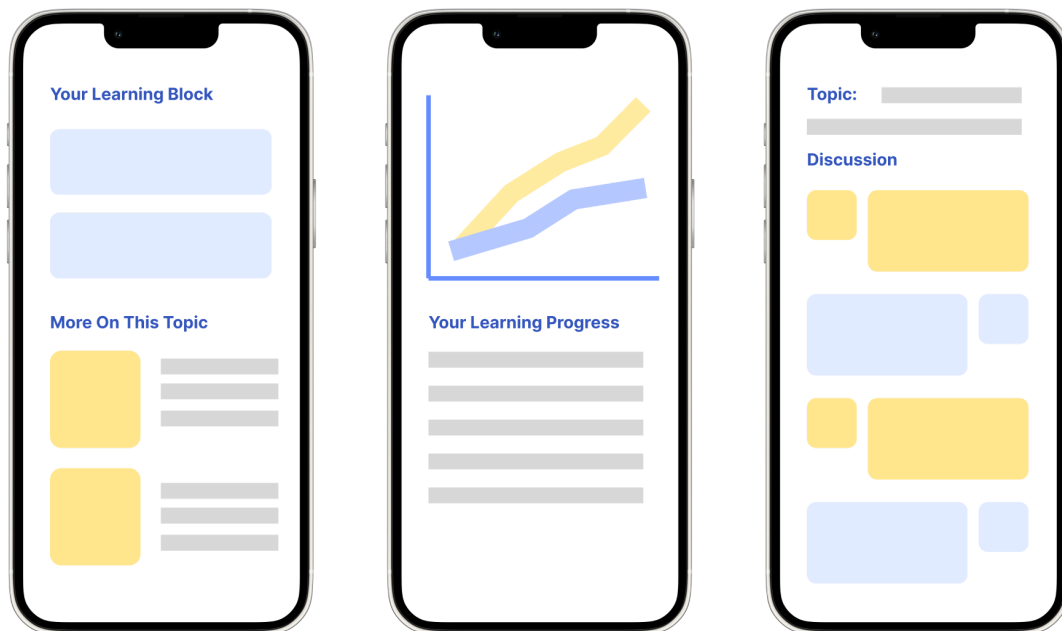
Feedback Received

- **Avoid using AI for everything:** It's very easy pitfall to design a AI tool that have AI doing everything for the user. It seems more like a capability test for AI rather than a design solution of the designer.
- **Focus on the key interaction**: Since the key concept is to have a conversational AI that helps user develop critical thinking skills during conversation, my project should be surrounding this key concept and illustration the user journey.

Final Solution

Collaborative Learning with AI

- **Drawbacks of the current model:**
  The current question-answer one-way interaction could lead to student passive learning, where students simply receive information without actively engaging with it. This can result in lower levels of understanding compared to interactive learning experiences. It may also build students' dependency on AI for easy answers.
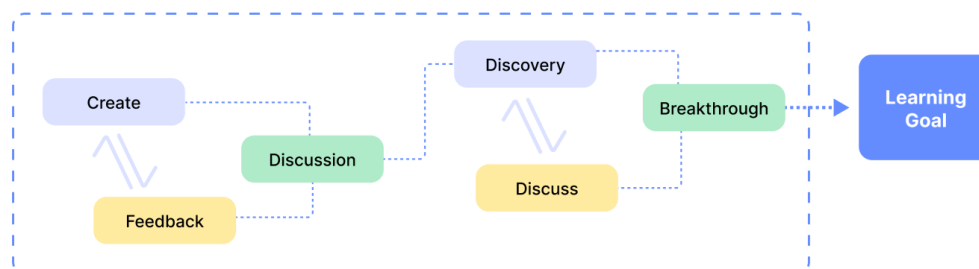
- **What is Collaborative Learning with AI:**
  In collaborative learning settings, AI can serve as a teammate, providing feedback and resources to student learn as if they work together on projects or assignments. AI encourages students to reflect on their experiences and questions the status quo, helping students develop critical thinking skills and deeper understanding of the material.

CURRENT MODEL: PROMPT - ANSWER

| Prompt | Answer | Follow-Up Prompt | Answer | ... |

SOLUTION: COLLABORATIVE LEARNING

Create → Feedback → Discussion → Discovery → Discuss → Breakthrough → Learning Goal
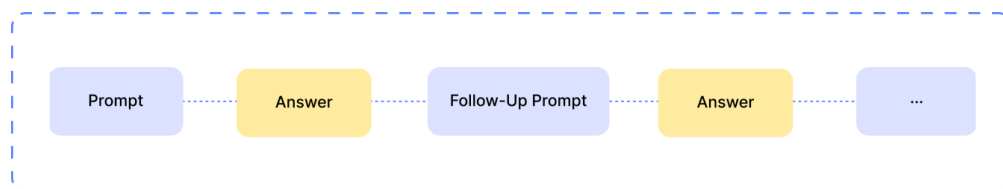
Design Walkthrough

- **Chat with personas:** Do you want a casual chat with a peer, or get expert's opinions on the topic? To start, user can choose from presets or create your own persona. Persona helps user quickly identify your learning objectives, and by using the persona which is trained to ask user different types of questions, they are able to improve their writing or gain a deeper understanding of the material.
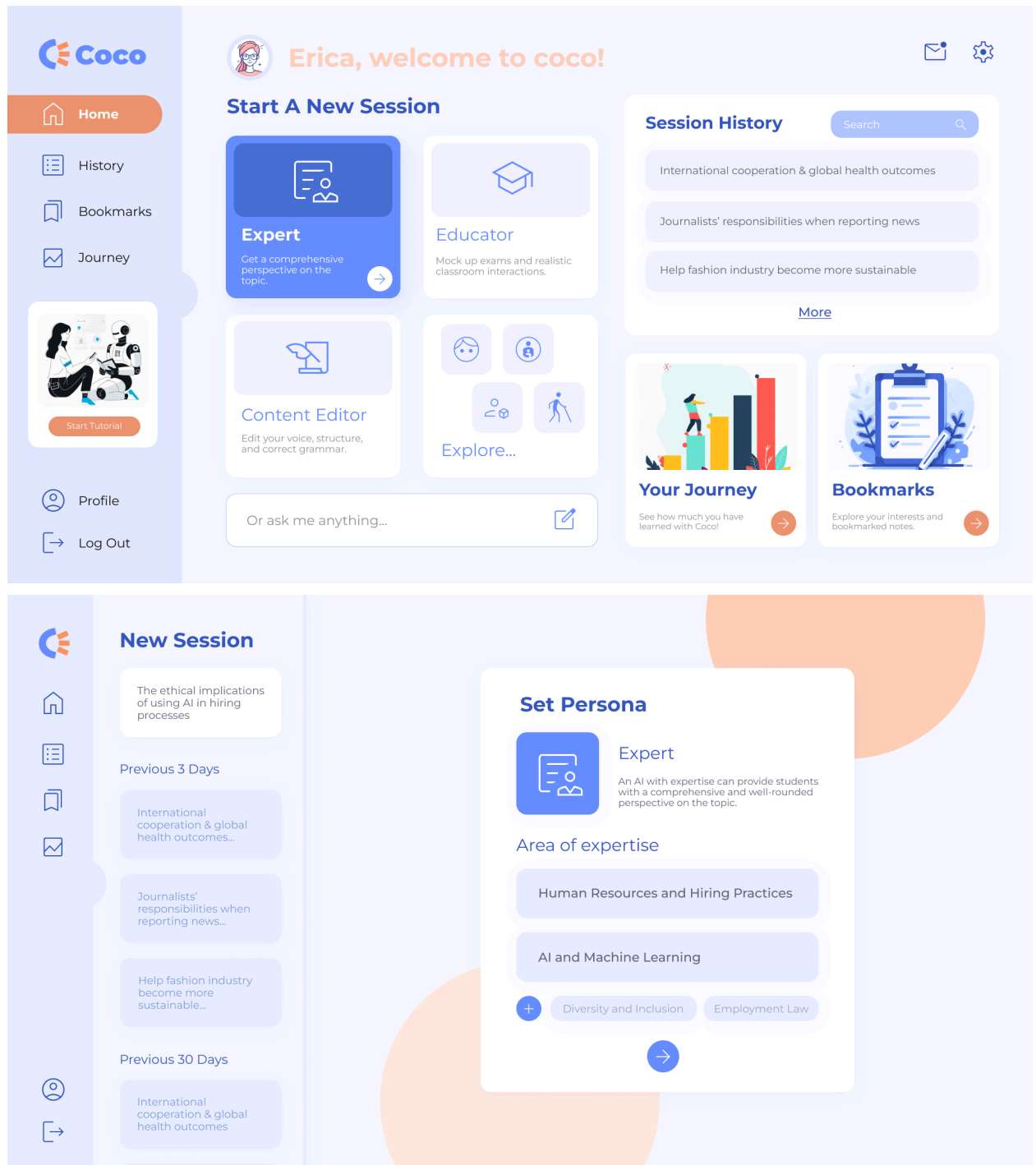
- **Dynamic Discussion & Critical Thinking:** Use a Socratic-style questioning approach to guide students through a structured, interactive, and inspiring discussion. By asking open-ended probing question such as: "What are your thoughts on these perspectives?", the AI encourages students to think critically and reflect on their personal experience.

New Session

The ethical implications of using AI in hiring processes

Previous 3 Days

International cooperation & global health outcomes...

Journalists' responsibilities when reporting news...

Help fashion industry become more sustainable...

Previous 30 Days

International cooperation & global health outcomes

Hi, I know many companies are using AI to select candidates these days, I don't know much about hiring process and how AI works, can you help me explain?

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Hmm, that sounds efficient, but I'm not sure if it's entirely fair. The AI might favor certain demographics based on the existing data. This could lead to a lack of diversity in hiring.

Diversity in Hiring   Bias in AI

What do you think about this topic?

New Session

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In your opinion, how could companies address these biases in their AI systems?

What do you think about this topic?

- **Spontaneous Discovery & Long-Term Development:** Interactive features such as reference and bookmark allows students to research the topics that interest them during the conversations. Coco promotes curiosity and a desire to explore topics in depth, fostering a love of learning that can continue throughout a student's life.

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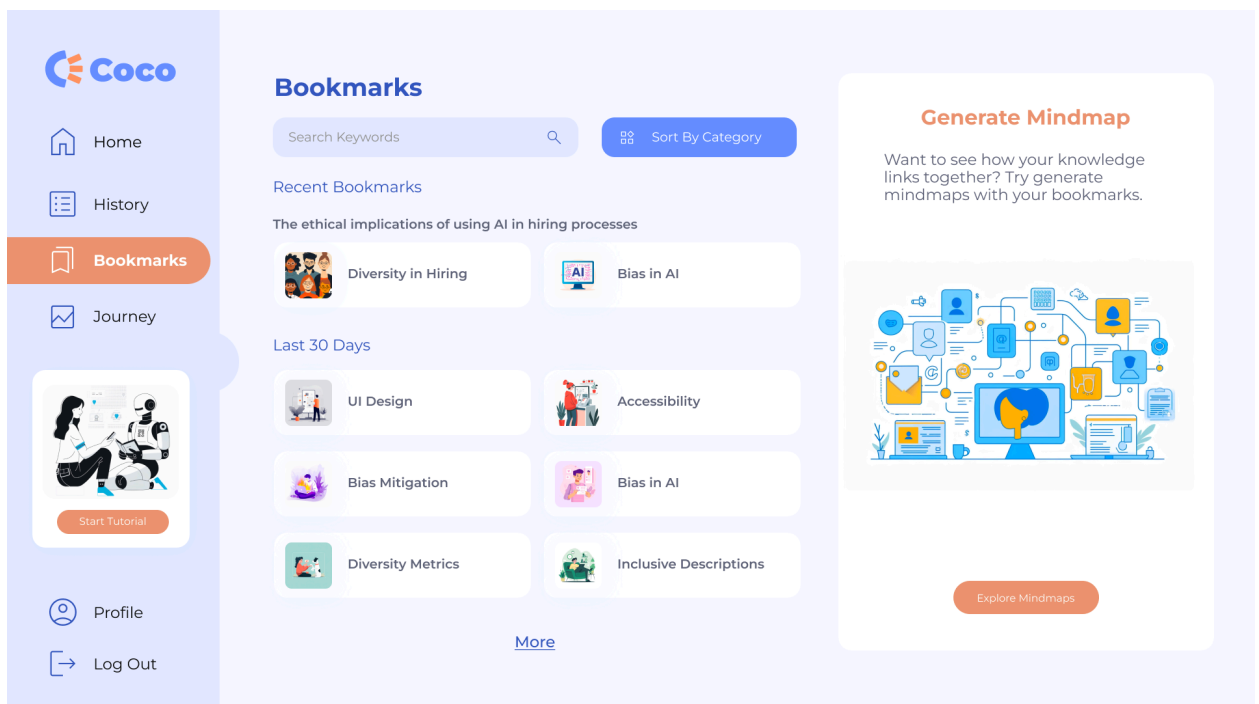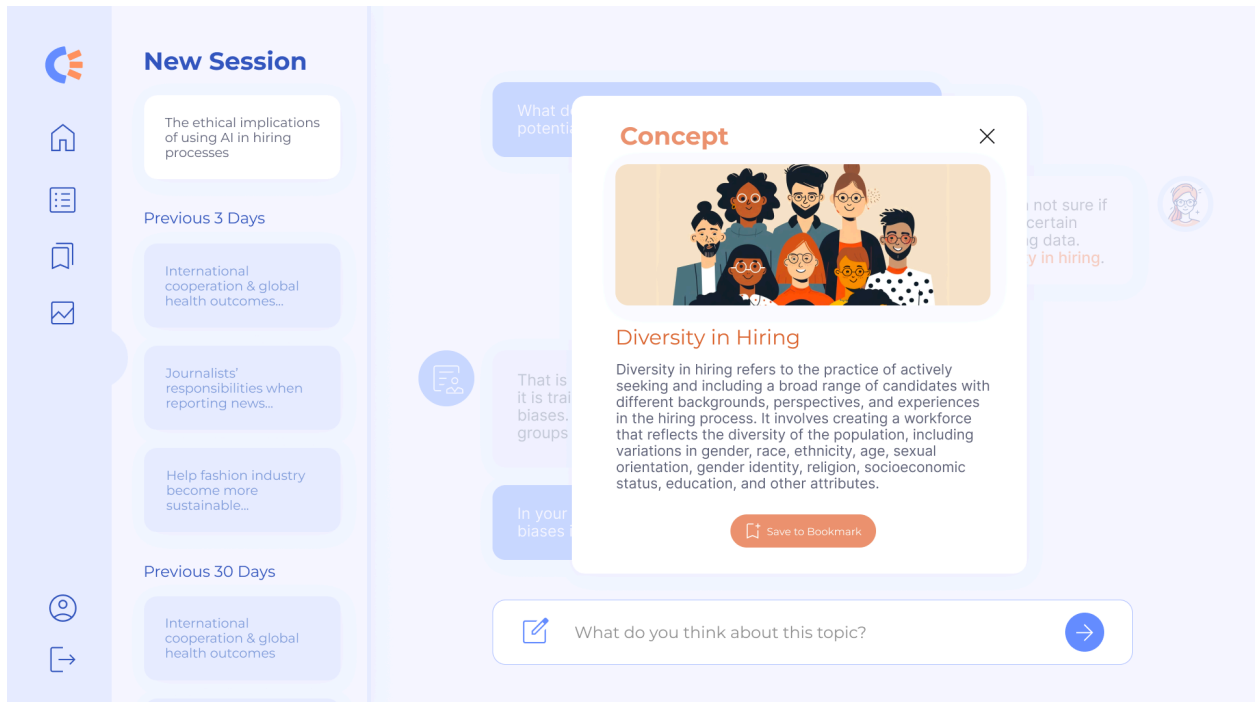
Reflection

Responsible use of AI:
-   This is a very interesting project for me to create because I have to use AI to build this product, testing its feasibility, and it surprised me how much AI can do for us! I implemented the collaborative learning method and co-created the dialogue I used in the final design screens, and I felt myself actually starting to feel more engaged and curious about the topic than during my usual interaction with ChatGPT. It turns out that AI is very good at role-playing and simulating scenarios, and I've also learned a lot about how to use AI more effectively for learning from many online resources. Now I think Coco is definitely a product I want to use.

Reflection on my creative process
-   This project went through several rounds of iterations, and it's kind of like the paradox of changing the tiles on the ship. When I realized it, the project seemed nothing like what it was when it first started. But after careful thinking, I realized that all the key elements are there, and what I did during the first semester actually set the stage for my pivot in the second semester. I think it taught me to change and pivot when I feel it's necessary, and I wouldn't have had so much fun with this project if I had stuck to my initial prompt.

What would I do differently:
-   I think what I didn't do well during the process is afraid to share my unfinished work, which resulted in not getting enough feedback at the early stage, and had to do a lot more work to make up for that in later stages. I think my mentality that showing unfinished work is shameful and worried about getting critiqued has hindered my learning. There's no way anyone can create something amazing at the first try, we learn as we fail, and it's very normal to fail. Once I accepted that failure is also part of the process, I started showing my very rough sketches to people, and opened to criticism and suggestions. I've learned and grown a lot from this experience, and I hope I started doing it earlier.

Appendix

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