

## I. Abstract

This project focuses on the design and development of multiple Gemini Gems, a specific chatbot was created to support college students enrolled in *Italian Food for Thought* as well as other bots were made for their respective classes. The goal was to design a network of chatbots that act as live tutors which enhances learning by providing quick, accessible explanations and study support related to its specific course. The project addresses the need for more engaging, student-centered learning tools that are able to pay attention to niche details that regular bots won't be able to give, even in the learning mode. Our team of four collaborated to plan, design, and implement the chatbot using Gemini's Gems, with a big emphasis on usability. The process required effective teamwork, communication, and project management to ensure that the final product met our goals. Gemini Gem is a great example of how conversational technology can co-exist and improve traditional coursework, offering students a new, supportive way to engage with class material beyond just lectures and readings.

## II. Intro

The design problem that guided our project centered on improving student engagement and accessibility in multiple areas of study, for me specifically that was *Italian Food for Thought*, which is a college-level course that explores Italian cuisine and culture. Our goal was to design an intuitive network of chatbots, using Gemini Gem, that could stand in for course materials, answer student questions, and provide cultural context in an interactive and conversational format without giving them the answer right away. The target audience for this tool is college students enrolled in the course who may need additional clarification, study assistance, or references to course content outside of class. By creating a series of chatbots tailored specifically to the audience that is students currently enrolled in the given chatbots course, our team made it our goal to improve learning efficiency and make studying and learning way more approachable. The project had us balance informative content with a more user-friendly interaction, in mind, ensuring that the chatbot was not just accurate and relevant but also engaging and easy to use. In the end, the purpose of Gemini Gem is to demonstrate how conversational technology can support education in meaningful, accessible ways.

## III. Process Description

This group assignment required collaboration, as well as persistence, and careful planning across multiple stages of development. Working in a group of four, we divided responsibilities informally. Each of us contributed ideas for the training of the chatbots, as well as course related content. I found myself taking more of a leadership role in directing overall scrums and meetings. I tried to coordinate our group progress as well. One of the biggest lessons I learned from this process was the importance of establishing a clear and efficient communication platform. Time management strategies should also be developed super early on

in the process. Although we did not assign strict roles, it did help to have someone pseudo in-charge as it made maintaining focus and ensuring that deadlines were met easier.

We approached the project using several project management strategies discussed in the textbook, including goal definition, iterative development, and team accountability. We met early and used that time to outline our deliverables and clarify what the chatbot should accomplish. We tried to adopt an iterative design process, which would mean regularly testing small components of the chatbot and discussing feedback as a group, but we ran into an issue of none of us having a schedule that perfectly lined up. We used Outlook as our main form of communication, though we all learned from this experience that It would be better to pick a better communication tool like Discord or text messaging. With this method and different communication tool, we definitely would have been able to refine our direction better rather than waiting until the near end to make adjustments. In terms of leadership, I found that setting short term goals for each meeting session definitely helped the group stay motivated and on top of things. This strategy is one that I definitely will be taking with me for future group projects.

Throughout this project I learned a great deal about communication in collaborative environments. It became very clear to me that effective teamwork requires not only technical contribution but also active listening and flexibility. Group projects often come with vastly different opinions and work styles, and balancing these was an essential part of this experience. I ended up gaining greater confidence in expressing ideas clearly and calmly, which is an incredibly valuable skill for both an academic and professional setting.

In terms of artificial intelligence, we did not use it to train or test our Gemini Gems, the project gave us an opportunity to explore how AI interfaces can support human learning. Designing a chatbot for educational use required us to think specifically about how users interact with AI like how the bot interprets questions, provides feedback, and maintains a consistent yet encouraging tone. This experience has helped me understand both the potential and the limitations of conversational AI. Moving forward, I can see how the importance of user-centered design and ethical AI use will be useful in any context where technology and communication are involved together.

#### **IV. Usability Study Method**

The Usability Study was split into 2 different sections. A testing script to follow to ensure that each of the users testing out the project were approached with the same questions and format as well as a Usability Survey which consisted of 6 multiple choice questions that followed the Likert Scale and 2 short sentence questions that ask the user what they liked about the bot and what they think would improve their experience with said bot.

The purpose of the script and survey were to measure usability, engagement, and support while learning. In the first section, I focused on some general questions such as “Are you currently taking Italian Food for Thought?” and “How comfortable are you with using AI chatbots or digital assistants?” which allowed me to further sort their responses into specific categories that made analysis of responses easier to understand. The following tasks were centered around the 5 E’s of user-centered usability and design. The final section was to close up the interviews allowing the test subject to list any comments or emotions that they felt during the testing phase. I also employed a Usability Survey to gather some more simplified data that was easy to understand and help me focus on which parts that needed working on such as engagement of users. While both of these were used to gather real course-based interactions, the test emphasizes the students’ experiences rather than just usability metrics, while the survey was focused on almost purely the metrics. The end goal is to learn how effectively Gemini Gem can communicate information, like whether it is engaging enough and the information can be provided in an efficient manner, and whether it actually improves users’ understanding of Italian food and culture or not.

## V. Results

Due to only testing on 3 different users, the sample size is quite small and thus does not represent all users of the chatbot Italian Food for Thought. Through testing the survey showed that all participants agreed that the responses from the chatbot were clear and accurate, as well as participants were able to get the information quickly, and the chatbot allowed the participants to recover easily from a mistake or wrong answer. One of the most challenging issues that I ran into which was highlighted above as well was user engagement. Most students simply do not want to spend the time learning if there is no form of goal or reward in the end. One of the following short answers from a user to the question -

*“What improvements would make this chatbot more useful for your learning?”*

with the response being -

*“While I did find the bot super helpful, It wasn’t very interesting to use.”*

Another question which was tied to the user engagement question was “I would use this chatbot again to study for or review class topics.” This question, like the former, scored lower on the Likert Scale with both getting 1 *disagree* and 2 *neutral* responses. Despite this one issue, the chatbot was incredibly easy to figure out without any intervention from me during the testing which is extremely important if this bot will be shared with others. It seems in general the Italian Food for Thought chatbot is well received and can be used in a serious academic setting for those who require a tutor but are not able to meet with the professor.

**VI. Recommendations - Based on the data collected in the usability tests, make recommendations for revising your project deliverable (150-250wds).**

Based on the results from both the testing survey and the usability test survey it seems the most glaring issue that should be fixed would be the user engagement levels. User engagement is extremely important to retain a user base as well as expanding said user base. Students are less likely to recommend or use this chatbot if using the bot itself is boring. A proposed change that I would implement would be more of a gamified style learning where the learning section allows users to gain exp and unlock badges depending on how much they have learned. Another potential way to increase engagement for this bot would be a rapid fire mode where its a fast paced or timed environment in which the user would answer questions, either multiple choice, fill in the blank, or short answers, in order to potentially speed up learning. I think it would also be important to test this bot and run more usability tests on more participants in order to get a better gauge on what may need fixing to make this bot more useful and efficient.

**VII. Appendix**

[Project Deliverable](#)

[Project Repository](#)

[Usability Survey](#)

[Testing Script](#)