Lab 1 Final Draft

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1. Introduction

Artificial Intelligence tools, such as ChatGPT and Gemini, have become integral to students lives. Some classes even require the use of them for class assignments, like Packback for discussion type questions where AI gives them a “curiosity score” based on how original and thought-provoking the question posted is. These tools can be helpful and help students learn more efficiently, but there are growing concerns that many students are relying too heavily on AI. The reliance on AI impacts students critical thinking and problem-solving skills, making them not learn these skills that will help them throughout their lives. A study by Qirui found that complete reliance on generative AI for writing tasks reduced the accuracy of the writing by 25.1% and the author found that “If students merely skim content or rely solely on AI-generated summaries, they might not develop the critical skills needed to discern fact from fiction” (Qirui). Students who rely too heavily on AI tools struggle with analytical reasoning and independent thinking.

The overuse of AI is a problem that is still being studied, but studies are already showing that AI dependence is having a negative impact on skill development and independent learning. Students are relying on generative AI to complete assignments, sometimes without even proofreading or editing the paper to ensure accuracy. According to Farhan, there are common mistakes when students rely on AI tools while writing, such as blind acceptance of AI suggestions and failure to develop independent writing skills. Many students do not check what AI is outputting, leading to incorrect information and improper grammatical changes, instead of thinking critically about if the suggestion makes sense and applies to what they are changing. By not learning about the topic, writing, and editing the paper, students are not learning how to gain knowledge on a topic or writing papers in their own words. The lack of these skills could impact them throughout their lives.

EduSense is an innovative platform that is designed to help students and educators use AI tools ethically and in a way that will help learn the material better while using modern technology. EduSense will be integrated with learning platforms, allowing instructors to upload assignments and control how students interact with AI. The LLM will not answer any questions directly; instead, it will try to help the students solve the problem independently with the use of guided questions, reflective prompts, and challenge modes. Educators will be able to upload assignments and class materials for the AI to direct students to reference. They will also have access to analytics to monitor how students are interacting with AI and identify any weak areas for individuals or the class. EduSense will include a copy/paste restriction layer, usage tracking, and admin controls for oversight by educators. EduSense is designed to support learning by helping students work through problems and increase/maintain their knowledge, improving critical thinking and problem-solving skills. EduSense will help students use modern technology while ensuring that learning is not replaced by AI.

2. EduSense Product Description

EduSense is an educational AI tool that will be used by students and professors to help encourage the ethical use of AI. Students will be able to ask EduSense questions about the assignments they are assigned, and they will receive assistance without receiving any answers. Students will be able to chat with the LLM and receive help while being encouraged to work through and solve problems independently. This will urge students to work on their critical thinking and problem-solving skills while still being able to ask for help if needed. The program will allow instructors to upload assignments and monitor student usage of the platform to identify potential areas where students need extra help. By promoting the use of AI without relying on it for answers, EduSense encourages students to use modern technology while still building critical thinking and problem-solving skills that will help them throughout their lives.

2.1 Key Product Features

EduSense is designed to provide assistance to students with a LLM while enforcing responsible AI use. It will allow educators to upload assignments or connect the class to the program, allowing the LLM to reference the class materials while helping the students. If the student asks or the LLM decides they need to read class materials to solve the problem, it will be able to reference the material and guide the student to where the information is located. When using EduSense, students will ask questions on the assignment and instead of providing answers, it will help the students by guiding the student on the principles behind solving the problem and explaining where to look for further assistance. By using this approach, students will be able to use AI tools while developing critical thinking skills, ensuring they do not become reliant on AI.

2.2 Major Components

The only hardware required for EduSense is an internet connected device that has access to a web browser. For the application, we will use the Django framework for interactivity and style, which will be written in HTML, CSS, and JavaScript. The backend will be written in Python and will handle the user requests, LLM integration, and assignment uploads. The database will be written in PostgreSQL to store assignments, interactions, and user data. Figure 1 shows the major functional components and how they interact within the program.

EduSense will allow instructors to choose which LLM can be used for the assignments. It will support OpenAI, Claude, and LLaMa. EduSense will also integrate with the Canvas REST API, allowing instructors to upload classes and assignments. This will also allow EduSense to access course materials for the LLM to reference.

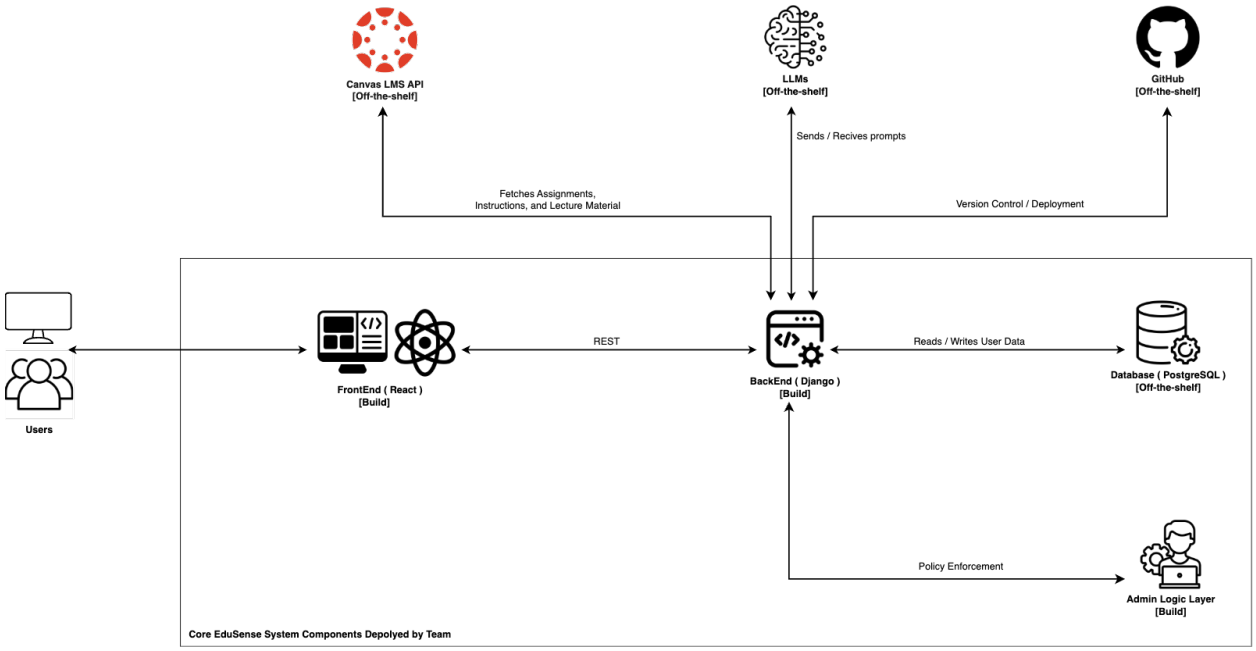

Figure 1 MFCD

3. Identification of Case Study

EduSense is being developed for students and educators in academic settings. As AI tools continue to increase in popularity, many students have become reliant on AI to solve problems and generate answers. While AI tools can be useful, overreliance can harm the development of lifelong skills such as critical thinking and problem solving. EduSense aims to address this problem by creating a platform to use these tools while promoting ethical and responsible use of modern technology. It will encourage students to think deeply about what is being outputted by the LLM, guiding them to make decisions rather than accepting the output of AI.

Beyond classroom use, EduSense has the potential to scale across diverse learning environments. Universities could integrate it into their academic integrity efforts, using it to not only help students learn but also safeguard against integrity violations. Corporate trainers and professional developments programs could also adopt EduSense to ensure employees are using AI intentionally in ways that follow company standards and enhance skills. By making an AI tool that complements learning, EduSense promotes a culture of accountability and ethical technology use.

Ultimately, the long-term vision for EduSense is to help learners of all ages and background use AI intentionally while promoting critical thinking skills. By reinforcing ethical AI use, EduSense contributes to the future of AI use in the world by supporting the use of new technologies in ways that help, rather than hinder, lifelong skills.

Glossary

- Artificial Intelligence (AI): A commonly used term encompassing any machine learning algorithm designed to train from a given input to provide an expected output.
- Large Language Model (LLM): An advanced machine learning algorithm trained on massive text datasets to understand and generate human-like language.
- Canvas LMS: A learning management system used by educators to manage course content, assignments, and communication with students.
- Challenge Mode: Setting that encourages learners to try on their own before getting help. It limits access to answers to encourage thinking through the assignment first.
- Guided prompts: Targeted questions or hints created to help students think critically and come up with their own solution.
- MFCD (Modified Functionality Component Diagram): A diagram showing the major hardware and software components of the product and how they interact.
- Usage Tracking: The process of recording how users interact with the system, such as which features they use or how they engage with LLM prompts.

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