EduSense

Feasibility Presentation
Team Emerald 07/14/25

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Team Emerald

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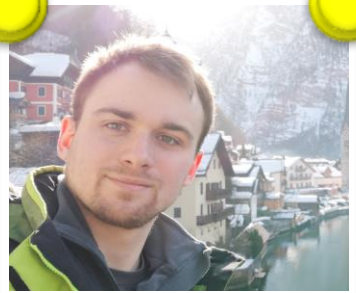

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ChatGPT and Grammarly have become everyday companions for students. There's a growing risk that we're letting AI do too much thinking for us, leading to weaker critical thinking, creativity, and problem-solving skills.

Recent studies show AI can boost writing quality and save time, but students who rely too heavily on AI understand less in the long term. That’s why we're building a mobile/web application that will encourage users to think first with features like reflective prompts, challenge modes, and usage tracking.

Our app will empower students and teachers to harness the benefits of AI while still building the independent skills that matter most for lifelong learning.

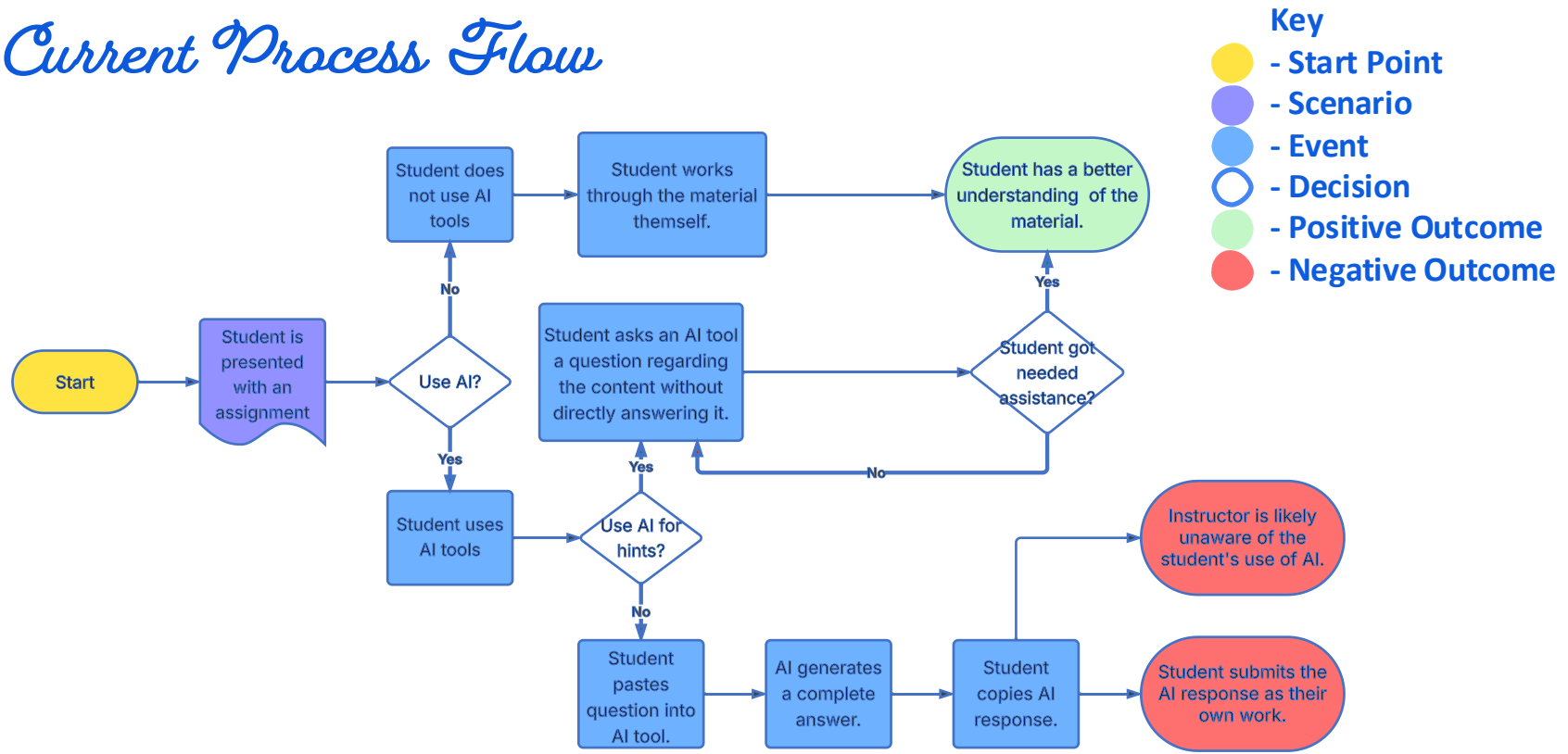
The Societal Problem

As ChatGPT, Grammarly, and AI search engines become more popular, many users, especially students, have begun to rely on them too much. Instead of using them for support, users are asking these AI tools to do their thinking for them. While that may seem helpful in the moment, it could cause long-term issues in developing critical thinking, creativity, and problem-solving skills.

Problem Characteristics

- According to Qirui Ju, a study conducted on a group of students found that those who fully relied on AI for their school assignments scored almost 20% lower during a writing assignment than those who don't. (Ju, 2025)
- A systematic review found that excessive reliance on AI dialogue systems significantly impairs students' abilities in critical thinking, decision-making, and analytical reasoning. (Zhai et al., 2024)
- Many users rely on AI responses without checking them, often because of mental shortcuts and cognitive biases. (Vasconcelos et al., 2023)

Current Process Flow



Solution Statement

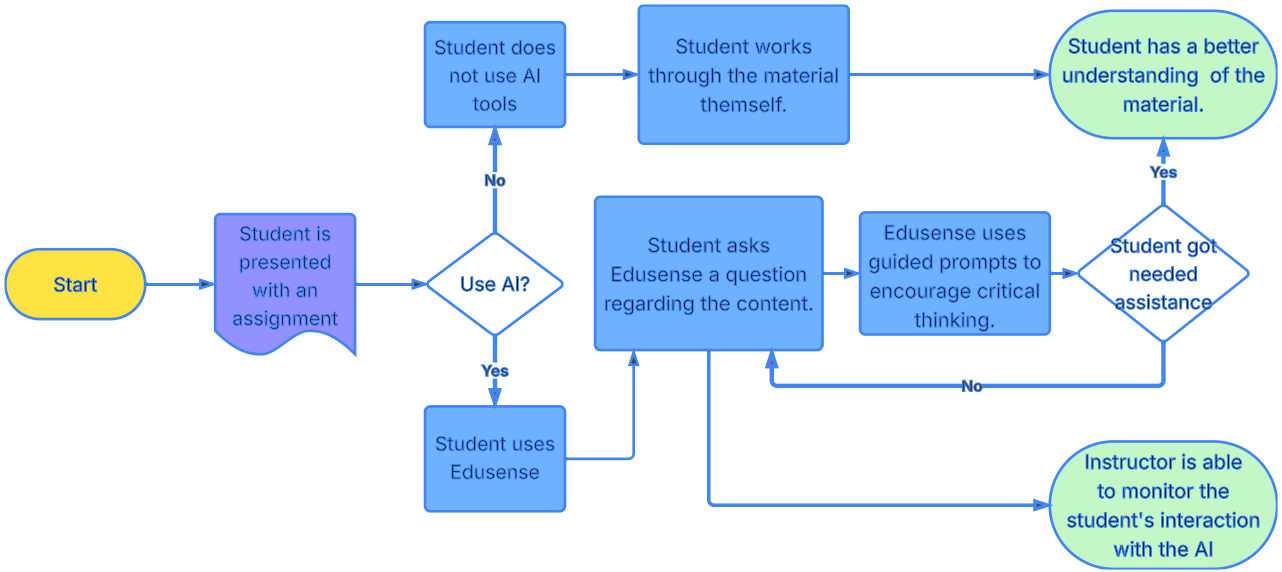
Our goal is to build EduSense, a mobile app and web application that helps students and educators use AI tools more intentionally. Instead of giving direct answers, the app will encourage users to use their own thought process first with the help of guided questions, reflective prompts, and challenge modes that limit or delay AI input. The end goal is to help students better understand the material.

The student's usage history will also be accessible to educators. This will allow them to identify problem areas in student comprehension and improve their lesson plans. Including integration with Canvas so that it can recognize the context of student questions.

Canvas Integration Overview

- Canvas was selected for its widespread adoption, reducing complexity for instructors and students
- Direct integration with Canvas API enables automatic syncing of assignments, due dates, and instructional materials into our platform
- AI generates guided prompts tailored specifically to the synced assignment content
- Instructors can directly control AI assistance levels for each synced assignment
- Student interactions are captured, allowing instructors to monitor common difficulties

Solution Process Flow



Key

- Start Point
- Scenario
- Event
- Decision
- Positive Outcome
- Negative Outcome

This Process Flow assumes that a student does not plan on letting AI tools solve their problems.

What It Will Do

- Help students develop critical thinking and problem-solving skills
- Provides the student with access to an LLM while completing their assignment.
- Guides the student's questions with leading prompts to help them arrive at the answer.
- Provides the instructor with the student's user history.
- Provide instructor with the ability to upload assignments to the platform.
- Integrate with learning platforms such as Canvas to better guide students.

What It Won't Do

- Provide direct answers to assignment questions.
- Replace the need for student effort and critical thinking.
- Diminish the guardrails put in place by the LLM's originator.

Competition Matrix

Function	EduSense	Chegg	ChatGPT	Google's AI Overview
Explains how the solution was achieved	✓	✓	✓	✓
Saves user history for review	✓	✓	✓	
Integrates with learning platforms to better assist students and instructors	✓			
Provides external links to more information	✓		✓	✓
Guides the user with leading prompts based on the desired answer	✓			
Improve Student Problem-Solving and Critical Thinking	✓			

Development Tools

Development Space	Tool
Frontend	HTML, CSS, JavaScript and React
Backend	Python (Django)
Database	PostgreSQL
Testing Framework	PyTest (Python), Jest (JavaScript)
Documentation Tool	Pydoc (Python), JSDoc (JavaScript)
LLM Integration	OpenAI GPT, Claude, Gemini, or LLaMa
Version Control / CI-CD	Git, Github, Github Actions, Github Workflows

Functional Components

- User Authentication (students & educators)
- Assignment Managment (upload, assign, track)
- AI integration (prompts, challenge modes, LLM access)
- Copy/paste restriction layer
- Admin controls (Educators can toggle certain LLM features by assignment as well as select from a variety of LLMs)

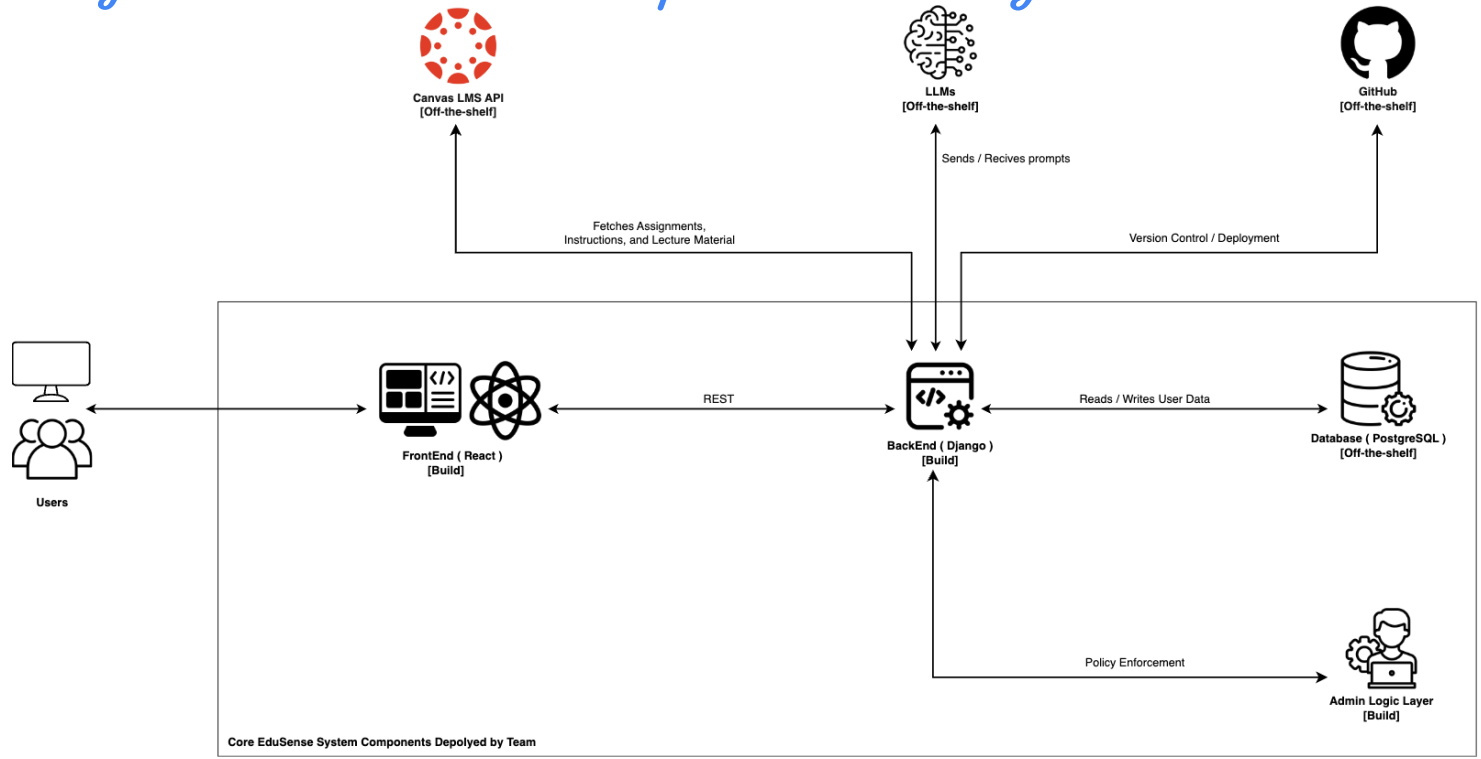
Admin Controls Example (ChatGPT)

- Students can use instructed or guided prompts during their schoolwork.
- Instructors can also select which LLM(s) of those supported can be queried by Edusense, or allow students to select one of the allowed options.
- These features can be toggled on or off by instructors on a per-assignment basis.
- This enables educators to tailor the assistance given to students for each task.

Gamification

- Students may feel inclined to bypass the guided prompts
- This issue can be mitigated by employing gamification to keep them engaged.
- EduSense will feature a 'challenge mode' with different difficulties that students can select from.
- Harder difficulties will limit the amount of support they get from the LLM (i.e. less guidance).
- Educators have the option to reward extra credit for assignments completed on harder difficulties.

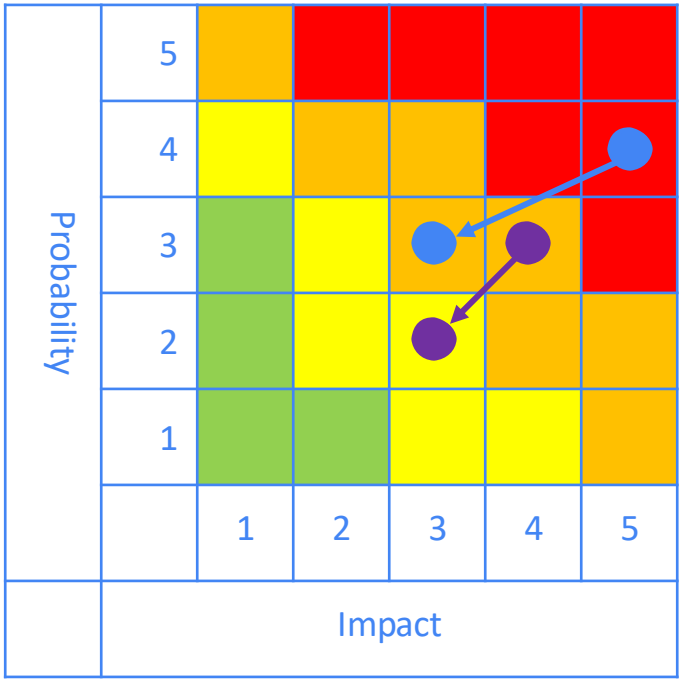
Major Functional Components Diagram



Risks Overview

- Bypassing Guardrails: Students may still find workarounds.
- Privacy concerns: Tracking usage must comply with FERPA/GDPR.
- Technical complexity: integrating restrictions and analytics.
- User adoption: Educators and students may resist new workflows.

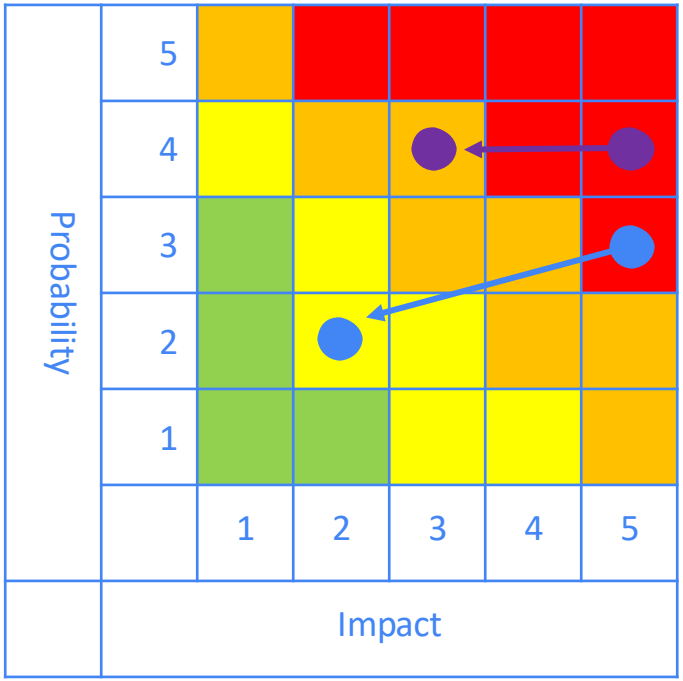
Risks - Customer & End User



- **Risk: Students Bypass Guided Prompts**
  - Probability: 4; Impact: 5
  - Mitigation: Employ gamification and reward users to keep them engaged.
  - Expected reduction: Probability: 3; Impact: 3

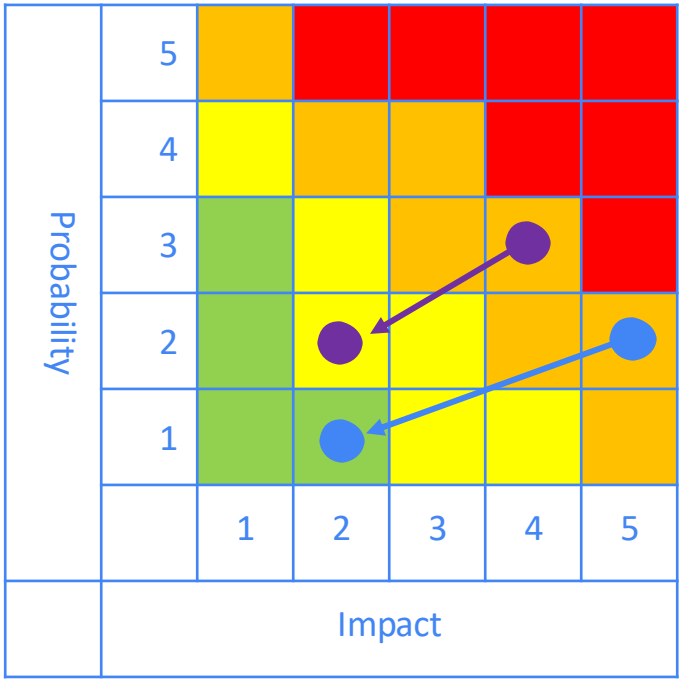
- **Risk: Students Find the Platform Cumbersome**
  - Probability: 3; Impact: 4
  - Mitigation: Our platform will remember what concepts users have already mastered, bypassing unnecessary prompts in future sessions and incorporating periodic knowledge checks to ensure users don't forget what they've already learned.
  - Expected Reduction: Probability: 2; Impact: 3

Risks - Technical



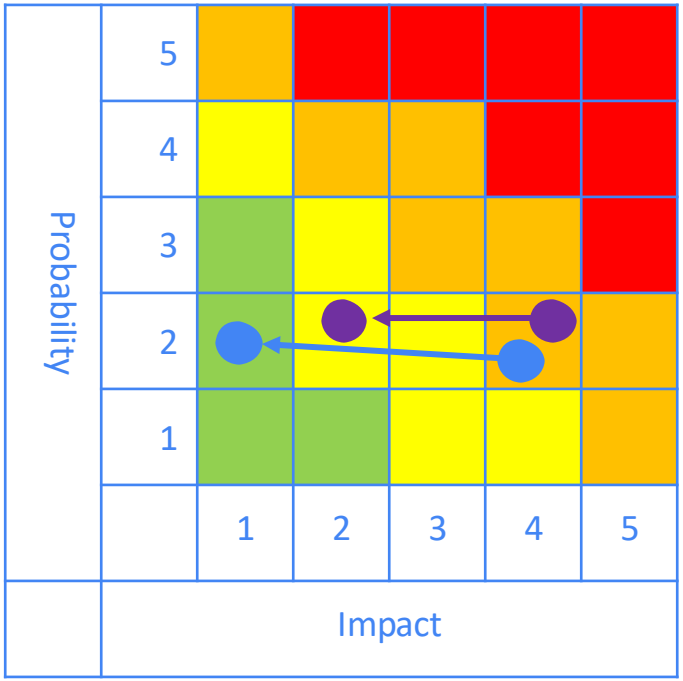
- **Risk: Prompt Guidance Fails**
  - Probability: 3; Impact: 5
  - Mitigation: Employ extensive testing with diverse special cases and include 'backstep/undo' options to revert to a previous state should a prompt fail to guide the student.
  - Expected reduction: Probability: 2; Impact: 2
- **Risk: LLM Quota Limits**
  - Probability: 4; Impact: 5
  - Note: Prototype risk that only needs to be considered during development.

Risks - Security



- **Risk: User Inputs Confidential/Personal Information**
  - Probability: 2; Impact: 5
  - Mitigation: Utilize the filters already present in the LLM to detect certain keywords and block certain prompts. Then relay the LLM warnings to the user. Also relay if any confirmation on the user side is required due to possible confidential data within in the prompt.
  - Expected reduction: Probability: 1; Impact: 2
- **Risk: Users Try to Access Harmful Content**
  - Probability: 3; Impact: 4
  - Mitigation: Utilize the filters already present in the LLM to detect certain keywords and block certain prompts. Then relay the LLM warnings to the user.
  - Expected reduction: Probability: 2; Impact: 2

Risks - Legal



- **Risk: Plagiarism**
  - Probability: 2; Impact: 4
  - Mitigation: Provide disclaimers and guidance on ethical AI use as well as encourage citation of AI assistance. The platform will provide MLA / APA citations of source material in this case.
  - Expected reduction: Probability: 2; Impact: 1
- **Risk: Copyright Infringement (e.g. user uploads textbook excerpts)**
  - Probability: 2; Impact: 4
  - Mitigation: Add a user content policy that prohibits copyright violations. In addition, utilize the filters already present in the LLM to detect certain keywords and block certain prompts. Then relay the LLM warnings to the user.
  - Expected reduction: Probability: 2; Impact: 2

Conclusion

- Large Language Models like ChatGPT and Gemini have become pervasive in education.
- Students and Educators need a tool that help them better engage with an LLM.
- EduSense will apply ethical AI use and the socratic method of teaching to fulfill this need.

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Appendix

Real World Product	vs.	Prototype
1. Scalable 2. Robust security 3. Full analytics & integration with LLM 4. Polished UX/UI 5. Proprietary LLM		1. Low Scalability 2. Basic Security 3. Limited analytic functionality 4. Basic UX/UI 5. Reliance on non-proprietary LLM

Glossary

- Artificial Intelligence (AI): Ability for a computer of machine to perform tasks that typically require human intelligence. Ex. Problem solving, languages, or understanding languages.
- 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.
- Large Language Model (LLM): An advanced AI system trained on massive text datasets to understand and generate human-like language
- 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 AI prompts.