Lab 2

Emerald Group – EduSense

Old Dominion University

CS 411W Professional Workforce Development II

Professor Kennedy

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1. Introduction

1.1 Purpose

The purpose of this document is to provide an in-depth description of the scope and functionality of the EduSense tutor software product. The intended audience for this document includes educators, school administrators, and policy makers.

1.2 Scope

Artificial Intelligence tools like ChatGPT and Grammarly are becoming integral to students' everyday academic routines. While these tools can be helpful, there are growing concerns that relying too much on them will have a negative impact on important skills like creativity, critical thinking, and problem-solving. One study found that students who depend heavily on AI for assignments score up to 20% lower on writing tasks compared to those who use it more thoughtfully. Many users also trust AI-generated responses without verifying them, which is often due to cognitive biases that affect their judgement. Notable solution requirements include the need to address LLM safeguards, educator receipt of poor quality, plagiarized work, and a lack of student use transparency. EduSense is currently in development as a web-based application designed to help students and educators use AI tools more intentionally. Instead of giving direct answers, the app will encourage students to think first by using guided questions, reflective prompts, and challenge modes to limit or delay AI input. Educators will also be able to upload assignments, monitor interactions with AI, and identify problem areas in comprehension. Key features include usage tracking, admin level controls for oversight and the ability to upload assignments and lesson plans. EduSense is meant to support learning, not replace it, by helping students and other learners build stronger problem solving and critical thinking skills.

1.3 Definitions, acronyms, and abbreviations

- 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.

1.4 References

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1.5 Overview

The remaining sections describe the following content:

A. Product Perspective: A description of what our team is building.
B. Product Functions: Describes the main features of our software.
C. User Characteristics: Discusses the various user roles that are included with the software.
D. Constraints: This section identifies the potential limitations or barriers to completion that our team expects to encounter.
E. Assumptions and Dependencies: This section lists the assumptions made about the process and the product as well as known dependencies that will be required. This section is not applicable for our purposes.

2. Overall description

2.1 Product perspective

EduSense is an innovative web application designed to help students and educators use artificial intelligence tools more resourcefully and effectively. This solution addresses the growing concern that overreliance on AI can weaken essential skills like critical thinking, creativity, and problem solving. EduSense encourages users to engage with their assignments independently, utilizing an LLM to aid them in their problem-solving process. The app allows instructors to upload assignments, monitor student interactions with AI, and identify areas where students might need additional help. By promoting intentional AI use, EduSense aims to empower students to develop lifelong learning skills while still benefiting from the advantages of modern technology.

2.2 Product functions

- EduSense is designed to foster independent thinking and responsible use of AI in educational settings.
- The platform allows instructors to upload assignments, giving them control over the learning material and enabling seamless integration with classroom activities.
- Students can access a large language model (LLM) for support while working on their assignments.
- Instead of providing direct answers, it uses guided prompts and leading questions to help students think through problems and develop their own solutions.
- By combining these features, it offers a unique and innovative approach that encourages critical thinking, supports educators, and helps students build essential problem-solving skills without becoming overly dependent on AI.

2.3 User characteristics

EduSense is being developed primarily for students and educators in academic environments where AI tools are increasingly used for assignments and learning support. The product addresses the need for intentional and responsible AI use, helping students build independent thinking and problem-solving skills while allowing educators to monitor and guide these interactions. In the future, EduSense could benefit corporate trainers, lifelong learners, and educational institutions seeking to promote critical thinking and ethical AI use across various learning and professional development contexts.

2.4 Constraints

N/A

2.5 Assumptions and dependencies

N/A