UOFT AI ETHICS HACKATHON

Use reference list for presentation

Use an existing design system for Figma Prototyping | https://flowbite.com

- [x] Choose Theme
- [x] Plan and Decide Features
- [x] Design UI → Build UI
- [x] Design Backend → Build Backend
- [x] Finish Documentation
- [x] Prepare Presentation Slides

AI in everyday life: **AI learning system**

Problem: AI Powered Learning Platform

Mission Statement: Traditional online learning platforms often struggle to provide **personalized learning experiences**, leading to decreased engagement and suboptimal learning outcomes. Many platforms use a one-size-fits-all approach, failing to adapt to individual student strengths, weaknesses, and learning speeds. This results in **frustration, disengagement, and gaps in knowledge retention** for students.

Our project aims to develop an **AI-powered adaptive learning platform** that dynamically adjusts content, difficulty levels, and teaching methods based on each student's learning patterns, preferences, and performance. This system will leverage **machine learning models** to analyze student interactions and provide real-time recommendations, ultimately enhancing the learning experience and improving educational outcomes.

AI ETHICS:

Data Collection:

Potential Job Displacement for Educators:

Learning Platform

- Input: Age, grade, interest, student info,.... →Neural Network/ML algo →Output: Classifies the student learning style and characteristic and spits out relevant info and learning modules

1. **Hour 1:**
    - Set up the project environment (frontend and backend).
    - Create a basic UI for the student to log in and start answering questions.
2. **Hour 2:**
    - Implement the question delivery system with a small dataset of categorized questions.
    - Add logic to adjust difficulty based on performance.
    - ML Algo
3. **Hour 3:**
    - Build the performance tracking system (e.g., track correct/incorrect answers and difficulty level).
    - Add real-time feedback for each question.
4. **Hour 4:**
    - Polish the UI (e.g., add a progress bar or summary screen).
    - Test the system to ensure the adaptive logic works as intended.
5. **Hour 5:**
    - Fix bugs, refine the user experience, and prepare a short demo.
    - Optionally, add a simple dashboard to display performance metrics.

Company Name: EduSense

Mission Statement: Making Education Accessible to everyone and promote intelligent learning

Define Product/Service: Identify the product or service you're building. How does it serve the sub-theme you chose? What is its social impact? Justify the identified problem with the need for a solution?

Education platform (Eg, D2L Brightspace).This app involves AI and machine learning which helps improve the learning experience of students in their daily life, recommend learning curriculums and customers learning path based on student data and makes it accessible to learners across the Persona spectrum.

It can be used as a learning tool/platform for students to help with their education journey and everyday study aid.

In terms of social impact, it is dismantling barriers to education so that all students regardless of their backgrounds and learning capabilities can consume educational content and benefit from it equally.

It solves the problem legacy university/school learning system creates, which is a rigid course curriculum that is not accommodating to students with disabilities/language limitations etc. This results in inefficient learning for students which results in unequal learning outcomes for the group as a whole.

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Pham Dat - Design, Frontend, Documentation

Vincent Lam - Backend

Solution Development:

It solves the stated problem by offering an interactive and intelligent solution that curates learning content based on student data and provides a learning curriculum/journey that best fits the student characteristics and learning abilities.

A machine learning neural network is involved and used to take in student information.The student information is fed in using form inputs on the web page. based on the corresponding student information, the neural network will classify the type of learner the student is using the softmax regression algorithm. Based on the output of the algorithm, the Web App changes the content displayed.

Ethical Matrix:

Stakeholder Identification:

- Users (Students): Entities using the platform and providing data that is fed to the algorithm,
- Developers(Group 25): The team creating and maintaining the AI
- Wider Society: People inside and outside Academia, General population.

Addressing Ethical Values and Concerns:

1. **Transparent Classification**: Our neural network uses softmax regression to classify learner types based on student-provided information. We're transparent about this process, clearly informing users that their input data determines content personalization.
2. **User Control and Consent**: Students actively provide their information through web forms, maintaining agency in the personalization process. No data is collected without explicit consent.

3. **Limited Data Collection**: We only collect information directly relevant to learning style classification, avoiding unnecessary personal data collection.
4. **Bias Mitigation**: We've designed our neural network to minimize potential biases in learner classification by:
    - Using diverse training data representing various learning styles
    - Regularly reviewing classification outcomes for potential bias patterns
    - Avoiding demographic data that could lead to discriminatory outcomes
5. **Explainable Recommendations**: The system provides clear explanations for why specific content is recommended, helping students understand the personalization process.

Stakeholder	Privacy	Fairness	Transparency	Data Usage
Students	- Only necessary data collected via consent forms. Clear data retention policies. Option to delete personal data. Secure data storage	Equal access to personalized content - Algorithm designed to avoid reinforcing existing inequalities - Regular testing for bias in recommendations - Alternative learning paths available	- Clear explanation of how the system works - Information on how learning style is classified - Understandable reasons for content recommendations - Right to question and override system decisions	- Data used solely for improving learning experience - No sharing with third parties - Student data not used for commercial purposes - Limited retention period for inactive accounts
Developers	-We collect data with user consent -The data collected is strictly academic related and no personal data is acquired	-The developed and trained model is based on research data and hence will be a reflection of concepts widely accepted in academia and won't produce biased and inaccurate results	-Yes the machine learning model is trained based on research on academia	-The machine learning model will not send the data to any 3rd party for illegal data storage
Educators	-The teacher will	-The teacher will	-the teachers will	-the data will

(Teachers)	have the ability to filter out the data they want to collect and that the teacher deems appropriate	be provided and accurate data and the teacher will have the ability to make the correct corresponding actions for the student based on the data	be provided documentation of the machine learning model and thorough explanation of how the model works	only be accessible to the teacher and will not be provided to 3rd party storages
Wider Society	-Only the schools and the students who are comfortable with using the model will have their data collected	-The model is based on research data in education in academia and hence won't discriminate against any student from any background	-A thorough explanation of the model will be provided to the public to analyze and freely criticize	-The data will only be stored to the user and won't be leaked to any 3rd parties without consent