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ENGAGE AI INSTITUTE FOR PERSONALIZE LEARNING

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ABSTRACT

The rise of generative AI has opened new opportunities in personalized education. This review explores the development of the "Engage AI Institute for Personalized Learning," a web-based generative AI platform designed to create customized educational content for students from nursery to 12th grade. The project involves creating a content generation platform that allows users to log in input queries, and receive content such as stories, text, or educational games. A unique feature is the question interface, the platform enables users to input a topic, generate relevant content, and engage with open-ended questions on the topic. The system supports various difficulty level to cater to different learning needs.

Keywords: Generative AI, Natural Language Processing (NLP), Question Interface, Open-Ended Question, Nursery To 12th Grade Education.

I. INTRODUCTION

In the digital age, education is rapidly evolving with the integration of technology, particularly in personalized learning. Traditional education systems, while effective, often struggle to address the unique needs of individual students. With classrooms catering to diverse learning paces, styles, and preferences, the need for adaptive and personalized educational tools has become more pronounced. Generative AI, with its ability to create tailored content, offers a promising solution to this challenge.

The 'Engage AI Institute for Personalized Learning' project aims to leverage generative AI to transform the K-12 education landscape. This web-based application allows students to interact with the system by entering queries related to their subjects of interest. Based on these inputs, the AI system generates customized content—ranging from stories and informational texts to interactive educational games—designed to engage and educate students effectively. Moreover, to assess students' comprehension, the system introduces a unique question interface. This interface enables students to select a difficulty level and generates open-ended questions, encouraging deeper critical thinking rather than relying on standard multiple-choice formats.

Current research and tools in educational technology often employ static resources or predefined content, limiting the adaptability required for truly personalized learning. This project seeks to bridge that gap by creating a dynamic, AI-driven educational environment that adjusts to the individual needs of students from nursery to the 12th grade. By offering diverse content formats and interactive questioning, 'Engage AI Institute for Personalized Learning' aims to foster an immersive learning experience that encourages curiosity and independent thinking.

The focus of this paper is to review the progress made in developing this system, explore the potential of generative AI in personalized education, and discuss the challenges encountered. The insights gained from this research are intended to inform future developments in AI-driven educational tools and contribute to the growing body of literature on adaptive learning technologies.

II. METHODOLOGY

The methodology for the "Engage AI Institute for Personalized Learning" project outlines the step-by-step development of a web-based platform designed to provide personalized educational content for students from nursery to 12th grade. The project leverages generative AI to deliver customized learning experiences. Below is the detailed methodology reflecting 50% of the project completion:

1. Requirement Analysis

Conducted a comprehensive analysis to define core features, including user login, query input, AI-driven content generation, and a question interface.

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Identified the target audience and tailored the content to match the educational needs of nursery to 12th-grade students.

2. System Design and Architecture

Designed the system architecture with a focus on scalability, user-friendliness, and content personalization.

Developed wireframes and user journey maps, outlining the interaction flow from user login to AI-generated content display.

Selected the technology stack appropriate for integrating generative AI into a web-based educational application.

3. AI Content Generation Module

Developed the initial version of the AI content generation module, capable of creating stories, texts, and educational games based on user queries.

Integrated a system to accept user input in free-text format, allowing the AI to generate age-appropriate and topic-specific content.

4. Question Interface Development

Implemented a preliminary version of the question interface, enabling users to choose a difficulty level (easy, medium, hard) for questions.

Focused on generating non-multiple-choice questions to foster critical thinking and comprehension among students.

Ensured that the questions accurately reflect the content topics as specified by user queries.

5. Database Configuration

Established a database to securely store user details, query inputs, and AI-generated content.

Implemented best practices for data security and privacy.

Categorized content in the database, supporting enhanced user experience and future expansions.

III. CONCLUSION

Refining the AI-generated content to align with educational standards and age suitability. Enhancing the accuracy of the question-generation system, particularly in relation to difficulty levels.

Gathering initial user feedback to refine the user interface and improve AI content accuracy.

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