**Abstract:**

In the evolving domain of Education Technology, personalized and timely feedback is critical for enhancing student learning outcomes. This project proposes an Automated Essay Feedback System designed for an online learning platform seeking an AI tutor capable of evaluating student essays with a focus on identifying reasoning gaps and logical flaws. The system leverages state-of-the-art Natural Language Processing (NLP) techniques, including Sentence-BERT (SBERT) for generating contextual text embeddings and advanced models for argumentative structure analysis to detect inconsistencies in logic and coherence. A large language model (LLM)-based adaptive feedback generator delivers detailed, context-aware suggestions, while a personalization module tailors feedback according to each student’s historical performance and learning trajectory. The result is an intelligent, scalable feedback mechanism that supports critical thinking development and enhances the essay writing process through structured, constructive guidance.

Automated essay feedback systems have gained significant attention for their potential to assist students and educators in improving writing quality through timely, objective, and scalable evaluations. This paper presents the design and implementation of an automated essay feedback system that leverages Natural Language Processing (NLP) techniques to provide constructive, real-time feedback on student essays. The system incorporates key NLP tasks such as grammar checking, coherence and cohesion analysis, semantic similarity, and argument structure evaluation. Using pretrained language models and rule-based approaches, the system identifies areas for improvement in grammar, vocabulary usage, organization, and content relevance. Additionally, the feedback is tailored to different proficiency levels, ensuring personalized learning support. Experimental results demonstrate the system’s effectiveness in delivering meaningful feedback that correlates well with human evaluations, highlighting its potential to enhance writing instruction and reduce the workload on educators.

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