Enhancing Student Engagement In The Online Classroom Using AI

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Abstract

Online learning platforms are integral to modern education, but maintaining student engagement remains a challenge. This research proposes an AI-driven system that enhances engagement in virtual classrooms using Facial Emotion Recognition (FER) and Real-Time Question Generation. The FER module, powered by a Convolutional Neural Network (CNN), analyses student's facial expressions to detect emotional states like boredom or attentiveness. Based on these insights, disengaged students receive interactive questions to reengage them, while engaged students receive encouraging feedback. Simultaneously, the question generation module, utilizing Natural Language Processing (NLP), analyses lecture content to create relevant summaries, questions, and quizzes, fostering active participation. Educators receive detailed reports on engagement levels, enabling data-driven instructional improvements. By integrating emotion-aware feedback and personalized question generation, this system enhances student motivation, participation, and learning outcomes in online education.

Keywords

Facial Emotion Recognition, Online Learning, Student Engagement, Real-Time Question Generation.