

# Real-Time Exam Anomaly Detection in Moodle-based Exam Systems with an AI Agent

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**Abstract** - Online education takes a high priority in the modern world because technology is evolving so rapidly that education needs to adapt to this changing and evolving technology. However, after the COVID-19 pandemic, e-learning is the only available solution to continue teaching during the lockdown periods. The evolution of these studies also needs to adapt to the situation. One of the significant issues with this online evaluation method is the anomalies during the evaluation process. This proposed implementation mainly focuses on anomaly detection of the Moodle environment exam systems. The proposed system produces a Moodle plugin to detect the time taken for each question in the Moodle environment examination system and detect the exam anomalies using the time variations. Then analyze and calculate the time that each candidate has taken for each question and the average time. The invigilator can see the candidates who took more than average time and less than average time and get the suspicious candidate list. The plugin also contains a separate algorithm that monitors the candidate while facing the exam. This face detection algorithm will notice the unusual behaviours of the candidate and upload the created report to the database, and the invigilator can access these reports on their loggings. To guide the candidate system, they also have an AI agent who will help to understand the exam process, give pre-defined answers for the questions, and provide contact details of the relevant authorities for exceptional cases. Also, the developed plugin detects the system information and background apps that run during the exam process and automatically creates relevant reports, and uploads them into the database. After the system implementation, the system was tested using a selected audience. The developed application is an innovative initiative to support the Moodle-based examination process.

**Keywords** - artificial intelligence agent, face detection, online examination, Moodle, proctoring