Development and Integration of an AI-Driven PHP Adapter for Automated Mathematical Question Classification and Assessment: Enhancing Student Profiling and Feedback Mechanisms

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I certify that I have read this thesis and that in my opinion, it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.

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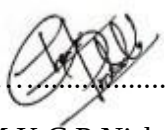
Head of Graduate Studies, FoC, SLIIT

DECLARATION

This is to certify that the work is entirely my own and not of any other person unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

Sign:  .....

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ABSTRACT

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The transformative growth of AI can be seen in almost every sector. AI can be a useful application for the educational domain as well. This research aims to combine IT to develop mathematics subjects by leveraging AI in practice mainly introducing Capabilities of Open AI. The primary objective is to create OpenAI API through a specially created PHP adapter to classify mathematical questions into six main themes Sets and Probability, Algebra, Numbers, Geometry, Measurements, and Statistics. This automated AI-driven classification system helps to create online assessments within the blink of an eye. The Integration of Open AI API with a PHP-based framework makes a bridge between AI capabilities and education needs. This framework is the ideal solution for manual and traditional school assessments. This plugin can be implemented in other university-level courses as well. The sample of the adapter plugin is only created and tested for secondary school mathematics classes for grade 10. This AI-driven mathematics classification system is designed to optimize the assessment process by providing additional objectives such as leveraging automated student grading feedback so teachers and students can see the result instantly. Additionally, answers are automatically generated after the assessment, displaying the solving steps that help students identify their mistakes. Meanwhile, this system also predicts the student's mathematics pass mark based on the results of the tests taken from this system.

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