



THE CORRECTOR ARTIFICIAL INTELLIGENCE APPLICATION FOR AUTOMATIC ASSESSMENT OF ESSAY QUESTIONS: AN INNOVATIVE SOLUTION TO IMPROVE STUDENTS' HOTS IN PURWAKARTA

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Abstract:

This study examines the development of an artificial intelligence (AI)-based application called The Corrector for automatic assessment of essay questions in Purwakarta, West Java. The aim is to overcome the limitations of multiple-choice questions in evaluating students' high-level thinking skills (HOTS) and reduce the burden on teachers. The methods include application development using ChatGPT API, PHP, Python, JQuery, and teacher and student perception surveys. The results show increased efficiency and accuracy of assessment and positive responses from teachers and students. Policy recommendations include gradual implementation of AI applications, teacher training, and ongoing evaluation to improve the quality of education in Purwakarta.

Keywords: *Artificial Intelligence, Automated Assessment, Essay Questions, HOTS, Purwakarta.*

INTRODUCTION

In this digital era, our education system is still struggling with evaluation methods that are less effective in measuring students' high-level thinking skills (HOTS). Multiple-choice questions, which are often used because of their ease of assessment, often fail to capture the nuances of students' critical and creative thinking[1]. On the other hand, essay questions that are better at measuring HOTS are rarely used because of the heavy burden of correction for teachers. (Nehm & Ha, 2011).

Purwakarta, as one of the regencies in West Java, is not immune to this challenge. Based on data from the Purwakarta Education Office in 2023, the teacher-student ratio in several schools reached 1:22, exceeding the ideal standard of 1:20. This condition makes it even more difficult for teachers to provide in-depth assessments, especially for essay questions.

This study aims to develop an innovative solution in the form of an AI-based application called "The Corrector" for automatic assessment of essay questions. This application utilizes ChatGPT technology to provide fast automatic assessment based on questions and answer keys from teachers. In addition, this study also examines the perceptions of teachers and students towards the use of The Corrector application through a survey. (Ilyas, 2023).

Identification Of Problems

Some of the main problems in the learning evaluation system in

Purwakarta include:

1. Limitations of multiple choice questions in assessing student HOTS. This type of question tends to test memory rather than deep understanding (Anderson & Krathwohl, 2001).
2. High time burden in correcting essay questions. Teachers often avoid giving essay questions because of time constraints for correcting (Nehm et al., 2012).
3. The less than ideal teacher-student ratio in Purwakarta (1:22) limits teachers' ability to provide in-depth assessment and quality feedback.
4. Lack of standardization in scoring essay questions, which can result in inconsistencies in scoring results between teachers or even by the same teacher at different times (Shermis & Burstein, 2013).

RESEARCH METHOD

This study uses a quantitative approach with a survey method. Data were collected through questionnaires distributed to teachers and students in schools in Purwakarta. The questionnaire for teachers consists of 20 questions covering aspects of knowledge about AI, the use of AI in learning, the effectiveness of using AI, teacher productivity, challenges and obstacles, and perceptions and attitudes (Ilyas, 2023).

Meanwhile, the questionnaire for students consists of 8 questions covering aspects of the experience of using The Corrector, speed of assessment, accuracy of assessment, student motivation, increasing number of essay questions, development of high-level thinking skills, and satisfaction with feedback (Ilyas, 2023).

The Corrector application development is done using ChatGPT API, PHP, Python, and JQuery technology. This application is designed to provide fast automatic assessment based on questions and answer keys from teachers. The main features of the application include automatic assessment, database integration, and a user-friendly interface.

RESULT AND DISCUSSION

Based on the results of the student questionnaire data analysis, the majority of students (74.3%) have been assessed using The Corrector application with varying frequencies. The Corrector has been proven to be able to speed up the assessment process, with 74.3% of students stating that the assessment results were received faster than manual assessments. The level of student satisfaction with the accuracy of The Corrector assessments is also quite high, with 74.3% of students feeling satisfied or very satisfied. (Ilyas, 2023).

The use of The Corrector has a positive impact on students' motivation in answering essay questions, with 71.4% of students feeling more motivated. In addition, there was an increase in the number of essay questions received by students after The Corrector was used. The majority of students (74.3%) also felt that The Corrector helped improve their higher-order thinking skills (HOTS).

The results of the teacher questionnaire data analysis show that most teachers understand the basic concepts of AI and are aware of AI applications in education. Many teachers have used AI as a digital assistant in preparing lessons, compiling lesson plans, and creating more engaging learning materials.

The use of AI is believed to increase the effectiveness of material delivery, provide faster feedback, and allow teachers to focus more on important aspects of learning. AI also helps increase teacher productivity by saving time in class

preparation, evaluation, and administration. (Ilyas, 2023) .

Evaluation Of Policy Options

Some policy options that can be considered to address problems in the learning evaluation system in Purwakarta include:

1. Increase the number of teachers to improve the teacher-student ratio.
 - a. Advantages: Can improve the overall quality of assessment and provide more attention to each student.
 - b. Disadvantages: Requires a large budget and a long time to implement. Does not immediately solve the problem of essay assessment efficiency.
2. Provide intensive training to teachers on HOTS assessment methods.
 - a. Advantages: Improves teacher competence in designing and assessing questions that measure HOTS.
 - b. Disadvantages: Does not solve the problem of assessment time efficiency. Teachers will still be burdened with long correction times.
3. Develop and implement AI Corrector application for automatic assessment of essay questions.
 - a. Pros: Increases efficiency and consistency of assessment, encourages wider use of essay questions. Allows teachers to focus on other aspects of teaching.
 - b. Disadvantages: Requires initial investment in technology development and training. Potential resistance from teachers who are not familiar with technology.

Policy Recommendations

Based on the evaluation of policy options, the main recommendation is to develop and implement an AI Corrector application for automatic assessment of essay questions in Purwakarta. The implementation plan includes:

1. AI-based application development using ChatGPT API, PHP, Python, and Jquery technology, adapted to the local context of Purwakarta
2. Application trials at pilot schools in Purwakarta, involving various levels of education.
3. Comprehensive training for teachers in the use of the application and interpretation of results, including how to integrate it with traditional assessment methods.
4. Periodic evaluation and improvement of the application based on feedback from teachers and students.
5. Gradual implementation across schools in Purwakarta, accompanied by ongoing technical support.

Implications

The implementation of the AI Corrector application for automatic assessment of essay questions in Purwakarta is expected to bring the following implications:

1. Increased assessment efficiency, allowing teachers to allocate more time to developing teaching methods and interacting with students.
2. Encourage wider use of essay questions, enhance students' HOTS development and ability to express ideas in writing.
3. Standardization of assessment, increasing consistency and objectivity of evaluation results, reducing potential bias in assessment.
4. Potential for improving the quality of education in Purwakarta as a whole, with a focus on developing critical and creative thinking skills.

5. Possible initial resistance from some teachers or parents who are concerned about the accuracy of assessments by AI requires proper socialization and education.

From an economic perspective, implementing this application can result in long-term savings in terms of time and human resources. Although there is an initial investment in development and training, the resulting efficiencies can compensate for these costs in the long run.

Socially, these applications can help reduce educational disparities by providing access to high-quality assessments for all students, regardless of their location or socioeconomic status. However, special care needs to be taken to ensure that these technologies do not create new digital divides.

CONCLUSION

The development of the AI application The Corrector for automatic assessment of essay questions is an innovative step that has the potential to change the paradigm of learning evaluation in Purwakarta. By increasing the efficiency and effectiveness of assessment, this application can encourage the development of students' HOTS and improve the overall quality of education.

The results of the study showed positive impacts of using The Corrector in student assessment, such as acceleration of the assessment process, accuracy of results, increased student motivation, increased number of essay questions, development of high-level thinking skills, and satisfaction with feedback. Teachers also felt the benefits of AI in increasing the effectiveness of their learning and productivity.

The successful implementation of this policy will depend on close collaboration between local governments, schools, and technology developers. Continuous evaluation is also needed to ensure that these applications continue to be relevant and effective in supporting educational goals.

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