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The Use of Artificial Intelligence (AI) in Learning Results for Scientific Indonesian Language Courses at PGRI Wiranegara University

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A B S T R A C T

This research explores the impact of using Artificial Intelligence (AI) on scientific Indonesian language learning outcomes at PGRI Wiranegara University. With quantitative and qualitative approaches, this research shows a significant increase in the academic achievement of students who receive AI-based learning. The results of the analysis show a positive difference in values between the experimental group and the control group. Students reported positive experiences regarding AI assistance in overcoming learning difficulties. The conclusion confirms that AI integration is effective in improving the efficiency and quality of scientific Indonesian language learning in higher education. This research contributes to the development of innovative learning methods based on AI technology in higher education environments.

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INTRODUCTION

Higher education is a sector that continues to develop, where the implementation of learning requires adaptation to technological developments. University PGRI Wiranegara, as a higher education institution that focuses on Indonesian language scholarship, is faced with demands to continue to improve the quality of learning. This research aims to explore the potential for using artificial intelligence (AI) to improve student learning outcomes in Scientific Indonesian language courses at the university (Vinika Vidia Putri, Iswatul Khasanah, 2023)

Artificial Intelligence (AI), is a branch of computer science that focuses on developing systems that can execute tasks that require human intelligence. The main goal of AI is to enable these machines to understand, learn, and adapt to their environment. The main approach in AI involves creating algorithms that allow computers to imitate human cognitive processes, such as natural language understanding, decision making, and problem solving. There are two main types of AI: weak or limited, which are designed for specific tasks without extensive adaptability, and strong, which have learning and adaptability that is more similar to human intelligence. AI development involves techniques such as machine learning, neural networks, and deep learning. Although AI has made rapid progress in applications such as natural language processing, facial recognition, and gaming, ethical challenges such as privacy, security, and social impact need to be addressed for AI to provide maximum benefit to society (Supriyadi & Asih, 2021).

The use of AI in educational contexts has become an interesting research topic, especially in improving learning effectiveness. In Scientific Indonesian courses, the application of AI technology can help students understand and assimilate the material better. (Andriyanti et al., 2023) The existence of an AI system that can provide instant feedback and personalized learning can create a more adaptive and interactive learning experience. Therefore, this research aims to investigate the potential contribution of AI in designing effective learning strategies to improve student learning outcomes in these courses.

Education has a broad definition, namely life. This means that the use of AI in education has experienced rapid development, covering various aspects such as AI tutors, automatic evaluation, and personalization of learning. In Scientific Indonesian courses, AI technology can be used to analyze student learning patterns, adjust the curriculum, and provide suggestions that can help students overcome learning difficulties. By utilizing artificial intelligence, it is hoped that learning can become more dynamic and responsive to individual needs, creating a more inclusive and efficient learning environment (Nita et al., 2023)

This research aims to evaluate the impact of using AI on the learning outcomes of students in the Scientific Indonesian Language course at PGRI Wiranegara University. By analyzing learning outcome data and student responses to the use of AI technology, this research seeks to provide a deeper understanding of its potential effectiveness. It is hoped that the benefits of this research will contribute to improving the quality of learning at the tertiary level

and serve as a guide for other educational institutions in integrating AI into their curriculum (Batubara et al., 2023).

The importance of this research is also reinforced by the fact that technological changes, including AI, have changed learning paradigms. Conventional methods for measuring learning outcomes are no longer adequate considering the complexity and dynamics of learning today. Therefore, the application of AI can be the answer to adapting the education system to the demands of the times, so that students can be better prepared to face challenges in an increasingly competitive world of work (Mardikawati et al., 2023). Apart from that, the use of AI in learning Scientific Indonesian can help detect difficulties faced by students early. (Kennedy, 2023) With an AI system capable of analyzing student learning patterns, information is obtained regarding areas that require more attention in the learning process. This allows for more focused and adaptive learning so that each student can reach their maximum potential.

In the context of globalization, universities need to adopt the latest technology to compete in providing quality education. This research also becomes relevant to the global trend of using AI in higher education, which has been proven to make a positive contribution to improving the quality of learning. By applying AI to Scientific Indonesian courses, PGRI Wiranegara University can create a learning environment that is innovative and in line with the demands of the times. Apart from that, this research can make a scientific contribution to the development of the scientific field in Indonesia. The integration of AI with Scientific Indonesian courses can open up opportunities for further research to dig deeper into how AI can have a positive impact on understanding concepts and applying language in scientific contexts. As a result, this research can provide a basis for the development of a scientific Indonesian language curriculum and teaching methods at the tertiary level.

LITERATURE REVIEW

Research conducted by (Supangat et al., 2021) "Utilization of Artificial Intelligence (AI) as a Response to Student Learning Style". This research aims to analyze the importance of an automated PJJ system using artificial Intelligence (AI) with the Intelligence Tutoring System (ITS). Students complete one learning activity in the activity log and AI will determine the learning style of the student and direct it to learning content that is by the Learning Style student. This research uses Gap Analysis to identify differences between student expectations of the desired learning system with a system that is used.

Similar research was also carried out by (Putri et al., 2023) “The Role of Artificial Intelligence in the Student Learning Process at Surabaya State University”. This research explores the perspectives of UNISMA 2023 Mathematics Education students regarding the use of Artificial Intelligence (AI) ChatGPT in preparing seminar proposals. The research method uses a qualitative descriptive approach. The findings in this research show that using ChatGPT can help with paraphrasing, searching for definitions, and sentence

structure. Even though they are aware of the risk of plagiarism, respondents try to avoid it by manually paraphrasing.

Research "Impact of using Artificial Intelligence (AI) In Learning Islamic Religious Education" (Fauziyati, 2023). This research aims to describe the impact of using Artificial Intelligence (AI) in Islamic religious education learning. The research method used in this research is a descriptive qualitative method. The research results illustrate that the impact of using Artificial Intelligence (AI) in Islamic religious education learning carries great potential to increase efficiency and effectiveness in learning Islamic religious education. However, from the research results, there are also negative things related to the impacts of The use of AI in learning activities, one of which is reduced student literacy, creativity, and innovation.

Research gaps in the existing studies on the utilization of Artificial Intelligence (AI) in educational settings are evident based on the three mentioned research endeavors. Firstly, the study conducted by Supangat et al. (2021) focuses on the utilization of AI in adapting the learning environment based on students' learning styles. While this research provides valuable insights into personalized learning, there is a research gap concerning the assessment of the effectiveness and acceptance of such AI-driven personalized learning systems. Future research could delve deeper into evaluating how students respond to the recommended content based on their learning styles, measuring learning outcomes, and assessing the overall satisfaction and engagement of students with the AI-driven system.

Secondly, Putri et al.'s (2023) research explores the role of AI, particularly ChatGPT, in aiding students in preparing seminar proposals. While the study sheds light on the positive aspects of using AI for paraphrasing and information retrieval, there is a research gap regarding the ethical considerations and potential drawbacks associated with the use of AI tools in academic work. Future research could investigate students' understanding of plagiarism, and their ethical decision-making when using AI tools, and explore interventions or guidelines to mitigate the risks of unintentional plagiarism while utilizing AI for academic tasks.

Lastly, Fauziyati's (2023) research investigates the impact of AI on learning Islamic religious education. While the study acknowledges the potential benefits in terms of efficiency and effectiveness, it also highlights negative impacts such as reduced student literacy, creativity, and innovation. The research gap here lies in the need for a more nuanced exploration of these negative impacts. Future research could delve into understanding the specific mechanisms through which AI might hinder creativity and innovation, and propose strategies to mitigate these potential drawbacks. Additionally, investigating the role of educators in addressing these challenges and fostering a balanced learning environment would contribute significantly to the existing body of knowledge.

In summary, the identified research gaps emphasize the importance of exploring the effectiveness, ethical considerations, and potential drawbacks associated with the integration of AI in educational contexts. Addressing these

gaps would not only contribute to the advancement of knowledge in the field but also provide valuable insights for educators, policymakers, and technology developers striving to enhance the educational experience through AI integration.

METHODOLOGY

This research uses quantitative and qualitative approaches to explore the impact of the use of Artificial Intelligence (AI) on learning outcomes in the Scientific Indonesian Language course at PGRI Wiranegara University. A quantitative approach is used to collect statistical data related to student academic achievement, while a qualitative approach is used to understand the experiences and perceptions of students and lecturers regarding the implementation of AI in the learning process (Darmalaksana, 2020). First, in the quantitative aspect, this research involves collecting data in the form of students' academic scores in the Scientific Indonesian language course before and after the implementation of AI. These values will be analyzed statistically to assess significant differences between the control group (without AI use) and the experimental group (with AI use). In addition, data will be collected through a structured survey to assess the level of satisfaction and perceptions of students regarding the use of AI in learning.

Second, in the qualitative aspect, this research will involve in-depth interviews with students and lecturers involved in the Scientific Indonesian language course. Interviews will focus on student learning experiences, perceptions of the use of AI, as well as suggestions and input for improvement. Qualitative analysis was carried out using a thematic approach to identify general patterns and significant findings from interviews. Furthermore, to implement AI in learning, this research will use AI technology that can analyze student learning patterns. The AI system will be programmed to identify difficulties or weaknesses that students may experience in understanding Scientific Indonesian language material. AI will also provide personal feedback to help students improve their performance.

In the initial stage, this research will identify the AI model that best suits the scientific Indonesian language learning context. The selection of this model is based on the ability to analyze learning patterns, the ability to provide recommendations for improvement, and the readability of adapting to individual student needs. The process of developing and integrating AI in learning will involve collaboration between a team of researchers and AI technology experts (Wijayanti, 2015).

As the final step, the results of the quantitative and qualitative analysis will be synthesized to present comprehensive findings regarding the impact of using AI on learning outcomes in the Scientific Indonesian Language course at PGRI Wiranegara University. The practical implications of these findings will be discussed to provide recommendations that can increase the effectiveness of using AI in improving student academic achievement in these courses.

RESEARCH RESULT

The results of this research reveal the positive impact of the use of Artificial Intelligence (AI) on learning outcomes for the Indonesian Scientific Language course at PGRI Wiranegara University. In quantitative analysis, a significant increase in the academic achievement of students who take part in learning with the application of AI can be seen. The results of the comparison test between the control group and the experimental group showed that the group that received learning with AI had a higher average score.

Tabel 1. Summary of Experimental Post-Test t Test Results and Control Class

Class	Average	t count	t table	P
experimental class	21,00	5,043	1,998	0,0000
control class	19,12			

The results of the post-test t-test showed that the average completion of class assignments obtained experimental class was 21,00 and the average completion of assignments for the control class was 19.12, so it can be concluded that the average completion of assignments for the experimental class was 1.88 greater than that of the control class. From this table, the t count is 5.043 with a significance of 0.000. The t-table obtained from db 63 at the 5% significance level is 1.998. So, calculated t value > t table (5.043 > 1.998) and the significance value is less than 0.05 (p = 0.000 < 0.05). Thus, it can be concluded that there is a significant difference in student learning outcome scores in the experimental class and the class control.

The results of the quantitative data in this study show a significant comparison between the group of students who received learning using Artificial Intelligence (AI) and the control group who did not use AI in the Scientific Indonesian language course at PGRI Wiranegara University. Analysis of academic scores shows consistent improvements in the experimental group that received the influence of AI learning.

In particular, the results of the quantitative data show that the average score of students in the experimental group experienced a significant increase in a certain period after the implementation of AI in the learning process. A comparison of academic scores between the group using AI and the control group showed significant differences, with the group using AI showing a trend of increasing achievement.

Statistical analysis, such as the t-test or analysis of variance, can be used to measure the significance of the differences between the two groups. Additionally, quantitative data can also provide additional insight into the distribution of scores, standard deviations, and trends in score changes between experimental and control groups.

Thus, the results of this quantitative data provide strong support for the effectiveness of using AI in improving student learning outcomes in Scientific Indonesian Language courses at PGRI Wiranegara University. This increase in academic scores reflects the positive impact of AI implementation in supporting

the learning process, providing a strong empirical basis to support recommendations for the use of this technology in higher education contexts.

This improvement can be attributed to AI's ability to analyze individual student learning patterns. The AI system can identify areas that need more attention and provide specific feedback to help students understand the material better. Thus, the use of AI in scientific Indonesian language learning at PGRI Wiranegara University helps create a learning environment that is more adaptive and responsive to student needs.

Qualitative analysis also supports these positive findings by highlighting students' experiences and perceptions of AI use. Through in-depth interviews, students stated that the AI system provided significant assistance in overcoming learning difficulties. Personal feedback from AI provides clear direction about aspects that need improvement so that students feel more confident in facing exams and assignments related to Scientific Indonesian courses. Apart from that, lecturers involved in this research also responded positively to the use of AI in supporting the learning process. They report that the AI system helps them identify students who need additional attention, allowing them to provide more targeted guidance. Lecturers also feel that the use of AI increases time efficiency, allowing them to focus on aspects of teaching that require human intervention, while AI addresses the analysis and feedback aspects.

In the context of the discussion, the findings of this research indicate that the integration of AI in Scientific Indonesian language courses has the potential to improve the quality of learning at the tertiary level. The application of AI technology can help overcome challenges in learning, especially in overcoming disparities in student abilities and providing personal attention. These positive results have broad implications for curriculum and pedagogy development at the tertiary level, marking a shift towards learning approaches that are more adaptive and responsive to the needs of individual students.

However, the discussion also includes several important notes. For example, it is necessary to consider ethical and privacy aspects in the use of AI in educational settings. In addition, further efforts are needed to optimize AI systems to make them more accurate and efficient in supporting learning. The perfection of AI models, as well as integration with other learning methods, can also be the focus of further research to increase the effectiveness of using this technology in higher education contexts.

We can find out the effectiveness of the findings from the learning process implemented in 2 classes, namely the class that uses Artificial Intelligence and the class that does not use Artificial Intelligence in completing assignments in scientific Indonesian language courses. The effectiveness of the learning process also has several impacts, namely positive and negative impacts. The negative impact found was the effectiveness of time and references that were directly obtained through Artificial Intelligence.

Based on research, several negative impacts were found related to the quality of student assignments. The quality of what is done is almost the same between one student and another. Students' thinking patterns are also less

developed because they only take AI approaches without honing critical thinking skills.

CONCLUSIONS AND RECOMMENDATIONS

In concluding this research, it can be concluded that the use of Artificial Intelligence (AI) in the learning outcomes of the Scientific Indonesian language course at PGRI Wiranegara University makes a significant positive contribution. The results of the quantitative analysis show an increase in the academic achievement of students involved in learning with the application of AI. The higher mean score in the experimental group, compared to the control group, indicates the effectiveness of AI in improving students' understanding and performance in the course.

The importance of these findings is reinforced by the qualitative analysis, which highlights students' and lecturers' positive experiences and perceptions of the use of AI. Students report that the AI system provides significant assistance in overcoming learning difficulties, while lecturers assess that the AI helps them identify students who need more intensive guidance. The success of this AI integration shows the great potential of this technology in increasing the responsiveness of learning at the tertiary level.

Thus, the conclusion of this research leads to the understanding that the application of AI in Scientific Indonesian language courses can be considered an innovative step in improving the quality of higher education. This conclusion provides a basis for recommending further development and improvement in the use of AI technology in the context of scientific language learning. A shift towards more adaptive, personalized, and efficient learning is proven to be possible with this approach, enabling universities to continue to adapt to current developments and prepare students for the demands of an increasingly complex world of work.

ADVANCED RESEARCH

For further research related to "Use of Artificial Intelligence (AI) in Learning Outcomes for Scientific Indonesian Language Courses at PGRI Wiranegara University," several suggestions can be put forward to deepen understanding, increase effectiveness, and expand the impact of using AI technology in the context of higher education.

First, it is recommended to carry out a more in-depth analysis regarding the factors that influence the success of AI implementation. A deep understanding of how student characteristics, teaching methods, and curriculum elements can interact with AI technology can provide critical insights. Research could explore variables such as students' level of technology readiness, learning style preferences, and the integration of AI with existing teaching methods.

Second, further research could focus on developing more sophisticated and personalized AI models. Identifying and designing more complex algorithms, able to accommodate individual variations in understanding and learning styles, can increase the effectiveness of AI in providing feedback and

recommendations to students. Developing more adaptive and intelligent models can provide more optimal learning results.

Furthermore, it is recommended to evaluate the long-term impact of the use of AI on students' career development and success after graduation. Research can monitor students' engagement in real-world work, research projects, or the continuation of their education. This will help form a better understanding of how the use of AI in higher education settings can prepare students to enter the world of work.

Finally, the study could involve more subjects and educational institutions to assess the generalizability of the results. Involving various types of students, lecturers, and curricula from various universities can provide a broader and more representative view of the sustainability of the implementation of AI technology at the tertiary level in Indonesia.

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