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Training on the Utilization of AI to Create Questions for Teachers in Muara Gembong District Schools

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Abstract

The development of artificial intelligence (AI) technology has opened up significant opportunities to enhance efficiency and quality in education, including exam question creation. However, the use of AI by teachers in the Muara Gembong sub-district remains very limited due to a lack of understanding and technical skills. This community service activity aimed to improve teachers' competencies in utilizing AI-based applications such as ChatGPT, Quizizz, and Google Forms to develop exam questions more variably and efficiently.The implementation method included several stages: outreach, initial surveys, module development, hands-on training, as well as mentoring and evaluation. The activity involved 15 teachers from various educational levels in the area. Evaluation was conducted through pre-tests and post-tests to measure the improvement in participants' understanding and skills.The results showed an increase of 10 to 20 points for the majority of participants, reflecting the effectiveness of the module and materials in enhancing their understanding of AI-based question development. The decrease in the percentage of participants scoring below average (<70) from 100% to 70% is a positive initial indicator of improved teacher competency. Despite this significant improvement, 70% of participants still scored below 70. In addition, the training successfully fostered collaborative spirit among teachers in integrating technology into the learning process. This activity demonstrates that with appropriate training and sustained support, teachers in areas with limited access to technology can effectively adopt digital innovations.

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1. INTRODUCTION

The rapid development of information technology has had a significant impact on various sectors, including education. Artificial Intelligence (AI) is one of the key innovations being implemented in education to improve the efficiency and quality of the teaching and learning process. One potential application of AI is the automatic and adaptive creation of exam questions, which can lighten teachers' workloads and improve the diversity and quality of questions. However, the use of this technology is not yet evenly distributed, especially in areas with limited access and infrastructure, such as Muara Gembong District.

Previous studies have shown that the application of AI in education has a significant impact on the effectiveness of learning evaluation. Harry and Sayudin (2023) emphasized that AI can accelerate the evaluation process and provide real-time feedback. Meanwhile, Supriadi et al. (2022) demonstrated that the use of AI in learning can increase student motivation and competitiveness. Karsenti (2019) revealed significant challenges in implementing AI in educational settings, such as limited teacher understanding and infrastructure readiness.

Rusmiyanto et al. (2023) also highlighted the role of AI in helping teachers develop teaching materials and questions more efficiently through a data-driven system.

Based on this study, the scientific novelty of this article lies in strengthening the capacity of teachers in remote areas through practical training focused on the direct use of AI applications in test creation. This activity provides not only theoretical understanding but also practical skills in using AI-based applications such as ChatGPT, Quizizz, and Google Forms.

The issue addressed in this article is how to improve teachers' understanding and skills in using AI to independently and effectively create questions in schools with limited access to technology. This article also starts from the hypothesis that AI training designed using active and contextual methods can improve teachers' competency in question creation.

Thus, the main objective of this article is to describe the process and results of training on the use of AI in creating questions for teachers in Muara Gembong District, and to show that technology-based interventions can be implemented effectively in educational environments with limited resources.

2. IMPLEMENTATION METHOD

The method of implementing this research refers to a participatory community service approach, with the following structured stages:

1. Socialization: Conducted to introduce the objectives and benefits of training to teachers in Muara Gembong District.
2. Initial Survey: Identifying teacher needs and readiness through questionnaires and short interviews.
3. Training Module Development: The module is developed based on survey results and covers basic AI theory, application usage, and practice in developing questions.
4. Direct Training: Training is conducted face-to-face, including theoretical explanations and intensive practice with AI applications.
5. Mentoring and Evaluation: Teachers are given further guidance and evaluated through pre-tests and post-tests.
6. Program Sustainability: This is done through providing online access to training materials and discussion forums.

Each stage of implementation is aimed at gradually building understanding and providing direct experience in utilizing AI for question creation.

Figure 1. Flow of activity implementation

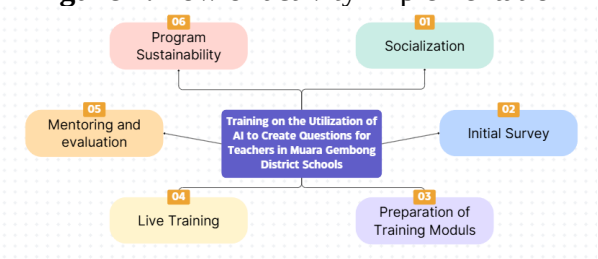

Figure 1 shows the implementation flow of activities, from problem identification to sustainability monitoring. Each stage is designed to systematically support the process of improving teacher capacity.

The methods used included a quantitative approach. This approach was implemented through pre- and post-tests to measure understanding and participant satisfaction questionnaires to explore participant experiences. Furthermore, experiential learning-based training methods were used to enable teachers to directly apply the technology they learned.

3. RESULTS AND DISCUSSION

Using a structured delivery method to improve teacher competency, particularly in utilizing AI technology for question development, the following are specific adjustments to the steps taken:

Pretest (Initial Understanding Level):
Prior to the program's initiation, teachers' initial understanding of AI technology for education and its dangers, such as misuse and data security, was assessed.
This survey can be based on direct interviews, field observations, or questionnaires as is also applied in research using observation methods.
Practice compiling questions using AI:
Provides a live demonstration of the use of AI in creating questions, how it works, and how to write prompts to be able to compose questions well.
Posttest (Understanding Increase Analysis):
After all steps are implemented, a post-activity evaluation is conducted to measure the increase in the level of public understanding of AI technology based on the training provided.

Figure 2. Pre-test questions
(Source: Personal Document)

Figure 3. Presentation of material by resource persons
(Source: Personal Document)

Figure 4. Presentation of training results
(Source: Personal Document)

Figure 5. Training Team and Participants
(Source: Personal Document)

Comparative Analysis of Pre-test and Post-test Results of Participants Before and After Training on Compiling Questions Using AI for Teachers at Schools in Muara Gembong District

As part of the community service evaluation in Muara Gembong District, teachers' understanding levels were measured through pre- and post-tests. This assessment aimed to assess the effectiveness of the material and practice of constructing questions using AI. The following are the results and analysis:

a. Pre-test Results

Before being given the material and practice, all 15 participants had inadequate initial understanding, with the highest score being 60 and the lowest being 20. The class average was 43, indicating that the majority of participants did not yet understand the use of AI technology in question preparation well. The distribution of scores in the pre-test can be seen in Table 1 below:

Table 1. Distribution of pretest results

No	Mark	Frequency (F)	Percentage (%)
1.	20	1	7
2.	30	2	13
3.	40	6	40
4.	50	3	20
5.	60	3	20

From the data above, 100% of participants obtained a score of <70, which shows that their level of understanding regarding AI technology is still very low.

b. Post-test Results

After delivering the material, practicing, and creating questions using AI, post-test results showed a significant increase in participant understanding. The highest score increased to 80 (obtained by two students), while the lowest score increased to 40 (obtained by three students). The class average increased to 58, with the score distribution shown in Table 2 below:

Table 2. Distribution of post-test results

No	Mark	Frequency (F)	Percentage (%)
1.	40	3	20
2.	50	2	13
3.	60	5	34
4.	70	3	20

5.	80	2	13

After the training, only 66% of participants (7 people) had scores below 70, while the remaining 34% (3 people) managed to achieve scores >70.

Comparison of Pre- and Post-Score Frequency: Analysis of Pre-test and Post-test Results of AI Application in Education

After analyzing the pre-test and post-test results, there was a striking difference in the frequency distribution of participants' scores. This change can be used as a significant indicator of teachers' improved understanding of AI technology after receiving the materials and training. The following is an analysis of the frequency distribution of scores before and after the training:

1. Frequency of Pre-test Values

Distribution of Scores: In the pre-test, the frequency of scores was mostly spread in the low range (20–60). No participants managed to obtain a score >70.
Lowest score: 20 (1 participant or 7%).
Highest score: 60 (3 participants or 20%).
Class average: 43.
Distribution Analysis: Most of the participants gathered at a score of 40, which shows that although there is potential for understanding, they are still at a basic level.

The lowest score (20) achieved by two participants indicates that there are individuals who have a very poor understanding of AI technology.

The percentage of 100% of participants was below 70, so it can be concluded that the teachers' initial understanding was still very low before the training.

2. Frequency of Post-Training Scores (Post-test)

Distribution of Scores: In the post-test, there was an increase in participants' scores, both in terms of the highest score and the average score of all participants.
Lowest score: 40 (3 participants or 20%), increased from pre-test.
Highest score: 80 (2 participants or 13%).
Class average: 59.3 (up about 17% compared to pre-test).
Distribution Analysis: Participants with a score of 60 were dominant, with a total of 5 participants.
There were 5 participants (34%) who managed to achieve a score above 70, which was not previously the case in the pre-test results.

The large number of participants with the lowest scores (40) indicates that despite improvements, some teachers still need more guidance to better understand this topic.

3. Comparison Before and After Training

Significant changes can be seen from the shift in the frequency distribution of values which reflects an increase in understanding as follows:

Table 3. Change analysis

Category	Pretest	Posttest	Change analysis
<70	100%	66%	The number of participants with scores

			below standard (<70) decreased by 33%.
>70	0%	33%	Three participants managed to improve their scores above 70, which was previously unheard of.
Lowest Value	20 (7%)	40 (20%)	The lowest score increased by 20 points, indicating a better level of basic understanding.
The highest score	60 (20%)	80 (13%)	The highest score increased by 20 points, indicating an increase in participants who understood the concept well.

4. Interpretation of Improvement

The increase in the frequency of these values indicates the effectiveness of the training conducted:

Practical and interactive training methods (such as AI-based question-making practice) help participants apply theory directly, making it easier to understand than just theory.

The increase in scores ranging from 10 to 20 points for the majority of participants reflects the success of the module and materials in improving their understanding of the use of AI technology for question preparation.

The decrease in the percentage of participants with scores below average (<70) from 100% to 70% is a good initial indicator in strengthening teacher competency.

Despite significant improvements, 70% of participants still scored below 70. To encourage better results in the future, the following steps should be considered:

1. Regular Mentoring: Re-evaluation of participants with low scores through small group discussions or question and answer sessions.
2. Material Enrichment: Emphasis on subjects that are most difficult for participants to understand, such as compiling prompts according to the question grid that has been created.
3. Repeated Practice: Provides more opportunities for hands-on practice, as this method has been proven to have a positive impact on participants.

Scientifically, this phenomenon can be explained through experiential learning theory, which emphasizes the importance of hands-on, experiential learning. Teachers who directly experience the process of developing questions with the help of AI experience a stronger internalization than those who learn purely theoretically. The trend of increasing teacher competence is also supported by intrinsic motivation that grows from success in practice and the encouragement of collaboration among teachers.

These findings align with a study by Harry and Sayudin (2023), which found that the use of AI in education increases the efficiency of the evaluation process, and a study by Supriadi et al. (2022), which demonstrated that technology can create a more adaptive learning environment. However, this study adds a contextual dimension by emphasizing that a community-based approach to training provides a more sustainable impact in resource-constrained areas.

Thus, these results answer the hypothesis proposed in the introduction, namely that contextually designed AI training can improve teachers' competency in question creation. Participatory and practice-based approaches have proven more effective in developing digital literacy in education than purely instructional approaches.

4. CONCLUSION

Training on the use of AI for test creation in Muara Gembong District significantly contributed to improving teacher competency, particularly in digital literacy education. A key finding of this activity was that the hands-on, contextualized training approach proved effective in improving teachers' understanding and skills in effectively using AI-based applications.

This activity answers the hypothesis that tailored training tailored to local needs and conducted in a participatory manner can lead to sustainable digital transformation in learning practices. This demonstrates that integrating AI technology into education depends not only on the availability of devices but also on strategies for empowering human resources through appropriate learning methods.

Thus, this training not only improves teachers' technical capacity but also fosters a collaborative learning ecosystem oriented toward innovation. These results can serve as a model for developing AI training programs for teachers in other regions with similar characteristics.

5. SUGGESTION

For further development, similar training programs should be expanded to other regions with similar technology access challenges, while still adapting to local needs. Further training is needed that integrates AI into other aspects of learning, such as formative assessment and interactive media development.

Collaboration between higher education institutions and local education offices is also recommended to establish technology-based teacher practice communities. This will strengthen the long-term impact and broaden the scope of AI implementation in education.

Several barriers to further development include limited internet connectivity, varying levels of digital literacy among participants, and the need for a more personalized training

approach. Therefore, a blended learning approach and ongoing technical support are essential for effective and equitable integration of AI into learning.

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