

Optimizing the Development of Learning and Teaching Materials by Utilizing ChatGPT for High School and Vocational School Teachers

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Abstract

The Community Service (PkM) activity aims to introduce and train the use of AI Tools, especially ChatGPT, to support learning and the creation of digital teaching materials for high school and vocational school teachers in Tanjung Bumi District, Bangkalan Regency. The activity was implemented for four days with a total of 32 hours of lessons, using lectures, discussions, demonstrations, direct practice, and mentoring methods. The material provided included an introduction to the concept of AI, an introduction to ChatGPT, the preparation of effective prompts, and the practice of utilizing AI in lesson planning. Evaluation was carried out through pre-tests, post-tests, and participant response questionnaires. The results of the activity showed an increase in participants' understanding and skills in utilizing ChatGPT, increased teacher insight and interest in the use of AI in learning, and participants' readiness to implement AI responsibly in their professional duties. Thus, this activity succeeded in improving teachers' digital competence and encouraging technology-based learning innovation in the secondary school environment in Tanjung Bumi District, Bangkalan Regency.

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1. INTRODUCTION

The development of artificial intelligence (AI) technology in recent years has brought significant changes to global educational practices. These changes include transformations in the design of teaching materials, learning strategies, and the assessment process for learning outcomes. AI can provide personalized learning, automate administrative tasks, and support content creation, accelerating the process of developing teaching materials by teachers. Secondary schools today face significant demands not only to transfer knowledge but also to develop 21st-century skills. These skills include critical thinking, creativity, collaboration, and digital literacy. Teachers are in a strategic position to design teaching materials, select methods, and facilitate learning activities relevant to students' contexts.

Real barriers include time constraints, high administrative burdens, and a lack of resources for developing contextual learning modules and media. Significant limitations in digital literacy and technology-based pedagogical skills remain among high school and vocational school teachers. Artificial Intelligence (AI) technology can be a helpful tool in addressing these issues. One AI-

based model is ChatGPT, which has been trained using text data to understand context and produce conversational responses.

The presence of ChatGPT as a pedagogical support tool significantly reduces the time required to produce teaching materials, enables responsive material adaptation, and encourages personalized learning tailored to students' cognitive levels and needs. Digital transformation demands increased digital literacy and pedagogical readiness among teachers. Teachers require not only technical skills in using tools but also a pedagogical understanding of when and how AI should be integrated into the learning process without compromising ethical aspects, content validity, and the development of 21st-century skills.

Previous research indicates an urgent need for a framework for developing teachers' digital competencies to ensure the use of technology is pedagogically meaningful. Teachers can utilize AI to design interactive and engaging teaching materials that increase student motivation and active participation. This effort aligns with the Merdeka Belajar (Freedom to Learn) policy, which emphasizes creativity, collaboration, and the use of technology.

To bridge this competency gap, this article proposes a solution approach in the form of structured training activities aimed at introducing and training teachers in the use of AI tools such as ChatGPT to support learning and the creation of digital teaching materials. The novelty of this activity lies in the direct integration of technical mastery of engineering prompts in ChatGPT with the practical fulfillment of curriculum achievement indicators. This training focuses not only on the technical aspects of "how to use" but also on the methodological aspects of implementing AI that are ethical, valid, and oriented towards 21st-century skills for secondary school students.

Specifically, the outputs and contributions of this activity are formulated into four main objectives:

1. Providing a basic understanding of AI concepts and their use in education.
2. Training teachers to use ChatGPT to assist in the creation of digital teaching materials.
3. Improving teacher competency in AI-based learning.
4. Encouraging the implementation of innovative and effective learning in schools.

2. IMPLEMENTATION METHOD

The method used is a Science and Technology approach and application. Community service activities focus on improving teachers' understanding and skills in utilizing artificial intelligence (AI) technology, specifically ChatGPT, developed by OpenAI, to support the learning process and teaching materials planning.

The following details the methods applied in this activity:

1. Participatory and Interactive Approach

Learning activities are designed to actively engage participants through two-way discussions, questions and answers, and sharing experiences related to the needs and challenges in developing teaching materials. Participants not only act as listeners but are also encouraged to participate directly by exploring and practicing using ChatGPT, thus creating a collaborative, dynamic, and contextual learning environment.

2. Demonstration and Hands-On Practice Method

The presenter systematically demonstrates the steps for using ChatGPT in creating teaching materials, from formulating learning objectives to developing materials, activities, and evaluation. Demonstrations were conducted using various relevant prompt examples, followed by independent practice by participants to help them understand the flow of use, modify the prompts, and apply them effectively according to their individual learning needs.

3. Cooperative Learning Model

This training employs a cooperative learning model that emphasizes collaboration and cooperation among participants in the learning process. Participants are divided into small, heterogeneous groups to discuss, exchange ideas, and help one another understand the material presented. Through group interactions, participants are trained to solve problems

collaboratively and complete assigned tasks, creating an active, communicative, and mutually supportive learning environment.

4. Evaluation and Feedback

To ensure that the training objectives are optimally achieved, periodic evaluations are conducted throughout the training. Evaluations are conducted through pre- and post-tests to measure participants' understanding of the concept of artificial intelligence (AI) and its applications, particularly in educational contexts. In addition, participants are asked to complete a satisfaction questionnaire as a form of feedback on the implementation of the activities, materials, and training methods. The results of this evaluation and feedback are used as reflection and reference for improving and developing community service activities in the next stage.

5. Assignments and Mentoring

After the training is completed, participants are given structured assignments aimed at directly applying the knowledge and skills they have acquired. Follow-up mentoring takes the form of consultations or guidance, both in-person and online, to ensure participants are able to effectively implement ChatGPT in developing teaching modules. With this mentoring, it is hoped that participants will become more confident and independent in utilizing AI technology to support the learning process.

This activity is an ongoing process that involves mentoring and evaluating the resulting learning media.

3. RESULTS AND DISCUSSION

Community Service activities with the title "Introduction and Utilization of AI Tools (ChatGPT) to Support Learning and Creation of Teaching Materials for High School and Vocational High School Teachers" have been carried out in a structured and interactive manner with the main target of high school and vocational high school teachers in Tanjung Bumi District, Bangkalan Regency for 4 days, namely October 21-24, 2025. This activity focuses on increasing teacher understanding and learning in utilizing artificial intelligence (AI) technology, especially ChatGPT developed by OpenAI, as a supporter of the learning process and open material planning.

Research Results

The pre-test and post-test results showed an increase in the average scores of participants, while the analysis of the participant questionnaire results can be described as follows:

1. Analysis of Material and Speaker Aspects

a. Material Understanding and Relevance

Most participants responded very positively to the material presented. 80% of respondents stated "Strongly Agree" that the material was easy to understand, and 95% of respondents stated "Agree" and "Strongly Agree" that the material was relevant to the needs of high school/vocational school teachers. This indicates that the material on the introduction and utilization of ChatGPT was appropriate for the learning context and the professional needs of teachers.

b. Speaker Mastery of Material

The level of satisfaction with the speaker was also quite high. 70% of respondents stated "Strongly Agree" and 25% stated "Agree." This means the speaker was deemed competent and able to explain the concepts of AI and ChatGPT well.

c. Material Delivery

More than 90% of respondents stated "Agree" and "Strongly Agree" that the material was presented in an engaging and interactive manner. Only one respondent disagreed, indicating that the delivery method was generally effective.

2. Analysis of Activity Implementation Aspects

a. Time and Duration

80% of respondents stated "Agree" and "Strongly Agree," while 20% of respondents considered the duration insufficient. Although the majority of respondents expressed satisfaction, this indicates that the training time needs to be extended, especially for the hands-on practice sessions.

b. Facilities and Committee

All respondents (100%) stated "Agree" and "Strongly Agree" that the facilities supported the learning process. All also stated that the committee provided good service. This indicates that the technical and service aspects of the activity implementation were very good.

3. Impact of Training on Participants

a. Increased Insight into AI

85% of respondents stated "Strongly Agree," and the remaining 15% stated "Agree" that the training increased their insight into AI.

b. Interest and Implementation

All respondents (100%) stated that they agreed and strongly agreed that they were interested in utilizing AI in learning. All respondents also stated their readiness to apply the training findings in their work as teachers. This demonstrates that the PkM activity successfully achieved its primary goal of increasing AI literacy and readiness to implement ChatGPT in learning.

Discussion

The Community Service program successfully improved teachers' knowledge and skills in utilizing AI tools, particularly ChatGPT. The implementation phase, which included the AI Introduction Material, ChatGPT Introduction Material, Prompt Material, and the practice of creating AI-based projects for lesson planning, proved effective. This aligns with the principle of andragogy-based training, which states that adults learn best when learning stems from their own experiences and needs (Knowles et al., 2014).

Teachers found it helpful because they saved time and gained new inspiration from ChatGPT output. Kasneci et al., 2023, stated that the use of ChatGPT can improve teachers' efficiency in designing lesson plans.

4. CONCLUSIONS

Through a series of materials covering an introduction to AI concepts, the use of ChatGPT, developing effective prompts, and creating evidence of AI work in lesson planning, participants gained knowledge and practical skills relevant to today's learning needs.

The results of the activity demonstrated an increase in teachers' understanding of the role and potential of artificial intelligence as a tool in the learning process. Teachers not only understood the basic concepts of AI but were also able to effectively utilize ChatGPT to support the development of digital teaching materials and more efficient and systematic lesson planning. Furthermore, this activity encouraged teachers to improve their competency in integrating AI technology into classroom learning practices.

This Community Service activity made a positive contribution to encouraging the implementation of innovative, adaptive, and technology-based learning in high schools and vocational schools. The appropriate use of AI tools is expected to improve the quality of learning and support teacher professionalism in facing the challenges of education in the digital era.

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