Teacher Competence in the Use of ChatGPT for Developing Learning Media in Vocational High Schools

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ABSTRAK

Kehadiran teknologi ChatGPT membuka peluang besar bagi pendidikan, khususnya dalam mendukung pengembangan kompetensi pendidik yang diperlukan di abad ke-21. Namun, kompetensi guru dalam memanfaatkan teknologi Artificial Intelligence (AI) saat ini masih rendah. Akibatnya, media pembelajaran yang ada belum optimal dalam menghadirkan bahan ajar digital yang menarik dan interaktif, sesuai dengan kebutuhan siswa di era pendidikan 4.0. Pengabdian ini bertujuan meningkatkan kompetensi guru SMK dalam penggunaan ChatGPT dan aplikasi AI untuk pengembangan media pembelajaran. Penelitian ini melibatkan 60 guru dari berbagai bidang. Metode yang digunakan adalah ceramah, diskusi, dan praktik langsung dengan pendampingan daring. Guru-guru dilatih membuat bahan ajar interaktif menggunakan ChatGPT dan aplikasi AI lainnya. Teknik analisis data menggunakan analisis deskriptif kualitatif. Hasil post test menunjukkan bahwa terjadi peningkatan kompetensi guru yang signifikan dalam hal penggunaan aplikasi AI, dengan skor rata-rata di atas 4 dari 5 dalam aspek-aspek utama seperti kebermanfaatan materi dan pengembangan keterampilan. Hasil kegiatan menunjukkan peningkatan kemampuan guru dalam memanfaatkan teknologi AI untuk pembuatan media pembelajaran berbasis digital, seperti video pembelajaran dan bahan ajar interaktif. Kegiatan ini memberikan kontribusi signifikan terhadap peningkatan kualitas proses pembelajaran di SMK. Pelatihan ini diharapkan mampu mengoptimalkan keterampilan digital guru, sehingga mampu menghadapi tantangan di era pendidikan 4.0.

ABSTRACT

ChatGPT technology opens up great education opportunities, especially in supporting the development of educator competencies needed in the 21st century. However, teacher competency in utilizing Artificial Intelligence (AI) technology is still low. As a result, existing learning media are not optimal in presenting engaging and interactive digital teaching materials according to the needs of students in the era of education 4.0. This community service aims to improve the competence of vocational high school teachers in using ChatGPT and AI applications for the development of learning media. This study involved 60 teachers from various fields. The methods used were lectures, discussions, and direct practice with online assistance. Teachers were trained to create interactive teaching materials using ChatGPT and other AI applications. The data analysis technique used qualitative descriptive analysis. The post-test results showed a significant increase in teacher competency in using AI applications, with an average score above 4 out of 5 in key aspects such as material usefulness and skill development. The activity results showed increased teachers' ability to utilize AI technology to create digital-based learning media, such as learning videos and interactive teaching materials. This activity significantly improves the quality of the learning process in vocational high schools. This training is expected to optimize teachers' digital skills to face challenges in the era of education 4.0.

1. INTRODUCTION

The rapid advancement of technology in the 21st century, especially in the field of Artificial Intelligence (AI), has significantly transformed various sectors, including education. AI tools such as ChatGPT offer new opportunities to enhance the teaching and learning process by providing educators with

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innovative methods to develop teaching materials, manage classes, and engage students in interactive learning activities (Grassini, 2023; Patel, 2024). As vocational education plays a critical role in preparing students for the workforce, integrating AI into teaching practices can help equip educators with the skills necessary to address the demands of Education 4.0, characterized by digitalization, automation, and the need for lifelong learning (Hussin, 2018; Ou, 2024). Vocational high schools (SMK) in Indonesia, such as SMK Ma'arif 1 Wates, face several challenges in terms of providing high-quality learning materials due to limited time, resources, and technical expertise among educators. Teachers often struggle to create engaging and effective media due to the lack of digital literacy and the time constraints imposed by their workload. This problem is particularly evident in schools with technical and vocational programs, where hands-on and interactive media are crucial for student comprehension. Addressing these challenges requires innovative solutions that can bridge the gap between traditional teaching methods and modern technological advancements (Chaika, 2024; Purmayanti, 2022).

Moreover, this community service project underscores the importance of lifelong learning for educators. As part of the training, teachers will not only develop technical skills in using AI tools like ChatGPT but also cultivate the mindset needed to adapt to future technological advancements. This capacity for continuous learning is crucial in the context of Education 4.0, where educators must be agile and responsive to new educational paradigms. By empowering teachers with these competencies, the project also aims to foster a culture of innovation within the school, encouraging educators to experiment with new teaching methods and technologies to improve student outcomes. The introduction of AI tools like ChatGPT into the educational sphere offers a potential solution (Golitsyna et al., 2021; Yu, 2024). ChatGPT, a text-based AI model, is capable of assisting teachers in content generation, planning lessons, and providing personalized feedback to students. These capabilities not only reduce the workload for teachers but also enhance the quality and accessibility of educational resources. In line with previous research, Rifky's study confirms that AI also plays a role in automated evaluation, reducing educators' workload in grading assignments and providing quicker feedback. Additionally, AI helps detect and prevent plagiarism, thereby enhancing academic integrity (Alam & Hasan, 2024; Rifky, 2024).

Previous studies have conducted research on ChatGPT training and its impact on both teachers and students. For example, another researcher stated that ChatGPT training can help students learn in an interactive and fun way. In their research, conducted a workshop on the utilization of AI for lecturers. The workshop concluded that ChatGPT is suited for self-directed learning, while Text to Speech Prosa.ai is recommended for creating audio learning content. The integration of these two technologies aims to create a more interactive and personalized learning experience (Manu et al., 2023; Maulana et al., 2023). Training on ChatGPT has also been conducted by several other researchers with positive responses, indicating that participants' understanding improved after the training. This training provides many benefits and purposes, including using ChatGPT as a tool for independent learning for students, as a tool for creating test instruments, to provide a significant positive impact on the knowledge and practical skills of educators in creating learning media and as an aid for university students in completing assignments (Ahmad, 2024; Annas et al., 2024; Pujiono et al., 2024; Utami et al., 2024).

Despite the potential of AI in education, many teachers in Indonesia are still unfamiliar with its usage and application. Therefore, targeted training programs are essential to improve teachers' digital literacy and empower them to effectively integrate AI into their classrooms. This community service project aims to address this issue by providing training to 60 teachers at SMK Ma'arif 1 Wates on the use of ChatGPT and AI for developing learning media. The training includes hands-on workshops and mentoring sessions designed to help teachers create digital teaching materials, such as interactive videos and lesson plans, that align with the needs of vocational education. Unlike previous training programs that only provided a single topic, this training is designed comprehensively, offering complete materials that combine various AI applications such as ChatGPT, Text-to-Speech, Canva, and Adobe Express. Additionally, the content supports all routine activities of teachers, starting with an introduction to AI, ChatGPT, and various AI applications that enhance learning; preparing lesson plans with AI; optimizing interactive learning through various AI applications; creating assessments and evaluating student work with AI; and writing scientific papers with the assistance of ChatGPT. By equipping teachers with these skills, the project seeks to improve the quality of teaching and learning at the school, thus enhancing both teacher competence and student outcomes (Kamalov et al., 2023; Nurhayati et al., 2024). The objectives of this project are: first, to enhance teachers' competence in using AI-based tools for creating learning materials, and second, to provide sustainable solutions that can be implemented in other vocational schools. The successful implementation of this project will contribute to broader efforts in integrating digital literacy into the Indonesian education system, ensuring that both teachers and students are prepared for the challenges of the digital era.

2. METHOD

This community service program was designed as a workshop to train vocational high school (SMK) teachers in the use of ChatGPT and other AI applications to develop digital learning media. The program was implemented at SMK Ma'arif 1 Wates, engaging 60 teachers from various disciplines. This community service activity uses a method of implementing service with a ADDIE model approach. The ADDIE model is a systematic instructional design framework used for developing educational programs and training. It consists of five phases: Analysis, Design, Development, Implementation and Evaluation (Adeoye et al., 2024; Suratnu, 2023). The procedures of this research are, analysis stage. The analysis stage involved identifying the needs of the teachers and the school through interviews and surveys. This step helped the organizing team to tailor the training content based on the specific challenges faced by the teachers in using digital tools for teaching. Key areas identified included the lack of familiarity with AI-based tools, limited digital literacy, and the need for innovative media to improve classroom engagement. The project team, consisting of lecturers, developed a comprehensive training curriculum that covered the basics of ChatGPT, the use of AI in education, and practical applications for developing learning materials. Second, design stage, in the design phase, the training curriculum was developed based on the analysis. The team designed a comprehensive program covering the basics of ChatGPT, the use of AI in education, and practical applications for developing learning materials. This phase focused on designing learning experiences, such as interactive presentations, quizzes, and videos, that would engage the participants and meet their needs. Third, development stage, here, the training materials, including lectures, discussions, and workshops, were developed and delivered. The initial session introduced the participants to the theoretical framework of AI, focusing on how tools like ChatGPT can be applied in educational contexts. Lectures covered topics such as: Introduction to AI Tools & ChatGPT, Designing Learning Materials with AI, Enhancing Interactive Learning with AI Applications, Evaluating Student Work Using AI. Following the theoretical sessions, participants engaged in practical workshops where they created teaching materials using ChatGPT and other AI applications. Teachers were guided through creating interactive presentations, quizzes, and videos designed to enhance student engagement and understanding in their respective subject areas.

Fourth, implementation stage, after the workshop, a one-month online mentoring phase was conducted. During this period, the teachers continued to develop their teaching materials with the support of the project team. A WhatsApp group and virtual meetings were set up to facilitate continuous guidance and feedback. This mentoring approach ensured that teachers could apply what they learned in the workshop, addressing any difficulties they faced while integrating AI tools into their teaching practices. And the last, evaluation stage. At the end of the mentoring period, participants were required to present their final products, which included digital learning materials such as PowerPoint presentations, instructional videos, and AI-generated quizzes. The presentations were conducted online via Zoom, allowing the project team to evaluate the teachers' progress and provide constructive feedback. A post-test survey was also administered to assess the improvement in the teachers' understanding and application of AI tools for teaching. These instruments measured the participants' prior knowledge of AI, their confidence in using AI tools for teaching, and their ability to create learning materials. The data were analyzed to assess the impact of the training on teacher competence and the quality of the digital teaching materials produced (Aldoobie, 2006; Méndez et al., 2022).

In this post-test, participants were asked a series of questions designed to measure four main dimensions of the training. The first dimension is material and instructor quality, which includes evaluations of the material's clarity, relevance, and depth and the instructor's ability to deliver the material, interact with participants, and answer questions. This assessment ensures that the materials and the facilitator's teaching style meet participants' expectations. Furthermore, the usability aspect of the materials for teachers focused on the practical application of the materials and AI tools such as ChatGPT in the teaching context, whether in lesson planning, student assessment, or increasing student engagement in the classroom.

The next dimension highlights teachers' skill level and understanding of ChatGPT and AI. This parameter measures participants' confidence and technical competence, especially in creating lesson content, assessments, and interactive presentations using AI. The aim is to see how much the training has improved their digital literacy and technical skills. Finally, participant satisfaction during the training is measured by assessing the structure, organization, and interactive elements provided. This evaluation covers the entire participant experience, from the registration process to support during practical sessions, to ensure the training offers valuable insights and meets their expectations.

3. RESULT AND DISCUSSION

Result

The community service activity led by the faculty team began with planning, forming a working group, and determining the target audience based on geographical location and needs. SMK Ma'arif 1 Wates was chosen due to its proximity to the campus, allowing the university to contribute to the surrounding community. The first step involved identifying the needs of the target audience through surveys and meetings, providing insights into their real needs. The initial pre-test showed that teachers at SMK Ma'arif 1 Wates were familiar with AI applications and used them for learning resources but had not fully explored AI for student assessments and evaluations. As a result, the team decided to hold a training session on the use of ChatGPT in education.

The training took place on August 2, 2024, at SMK Ma'arif 1 Wates, attended by 60 teachers. The event was opened by Hj. Sumiyati, S.Pd., M.B.A, the Vice Principal, who emphasized that the training aligns with the school's digital literacy program. She highlighted that AI technology, particularly ChatGPT, can significantly assist in preparing and delivering lessons, encouraging teachers to be creative in developing teaching materials and improving student learning quality. The first material presented was an introduction titled "AI Tools & ChatGPT," covering essential topics on the use of AI in education. It included an explanation of ChatGPT, its features, and other AI tools for learning. The second session focused on "Developing Teaching Materials with AI and ChatGPT," followed by practical sessions on "Optimizing Interactive Learning with AI" and "Evaluating Student Work with AI and ChatGPT." Participants learned to create learning content using ChatGPT alongside other tools, while also discussing the ethics and challenges of AI in education. The session included hands-on workshops with guidance from the faculty team. Participants were highly enthusiastic throughout the training, showing great interest by asking numerous questions during the hands-on practice sessions. The interactive nature of the workshop allowed them to not only observe but actively engage in the learning process. During the practical sessions, participants explored a variety of tools, including ChatGPT and Gamma, to create dynamic PowerPoint presentations with AI-generated content. This exercise helped them grasp how AI can assist in enhancing the visual and textual aspects of their teaching materials, making lessons more engaging for students. The documentation of the instructor explaining the material during the training is presented in Figure 1.

Figure 1. The Instructor Explains the Material During the Training.

Moreover, participants were guided step by step in developing teaching modules tailored to their respective subjects, integrating AI into lesson planning. They also learned how to create captivating learning videos using AI tools like Adobe Express and Text to Speech, which added a multimedia dimension to their teaching strategies. These videos were aimed at boosting student engagement and facilitating a deeper understanding of complex topics. Another key focus was using ChatGPT to generate assessment questions. Participants practiced designing quizzes, multiple-choice tests, and short-answer questions, aligning them with curriculum goals. They explored how ChatGPT could generate diverse question types, offering both time savings and creative inspiration in the assessment process. To consolidate their learning, participants were given an assignment to create teaching materials for their respective subjects using ChatGPT and other AI tools. This assignment spanned one month, during which the faculty team provided continuous support

through an online platform. The faculty team offered regular feedback, addressing participants' queries and troubleshooting issues they encountered while developing their materials. On September 14, 2024, participants presented their final work via Zoom, showcasing innovative teaching materials that integrated AI tools to enhance educational outcomes. This presentation session allowed participants to exchange ideas, receive peer feedback, and discuss best practices for AI implementation in education. After the presentations, they took a post-test designed to assess their learning progress and the extent to which they had mastered the application of AI in creating interactive and effective teaching resources. This post-test, combined with the participants' reflections, helped measure the overall success of the training and its impact on their professional development. The documentation of the participants presenting their final works through zoom is presented in Figure 2.
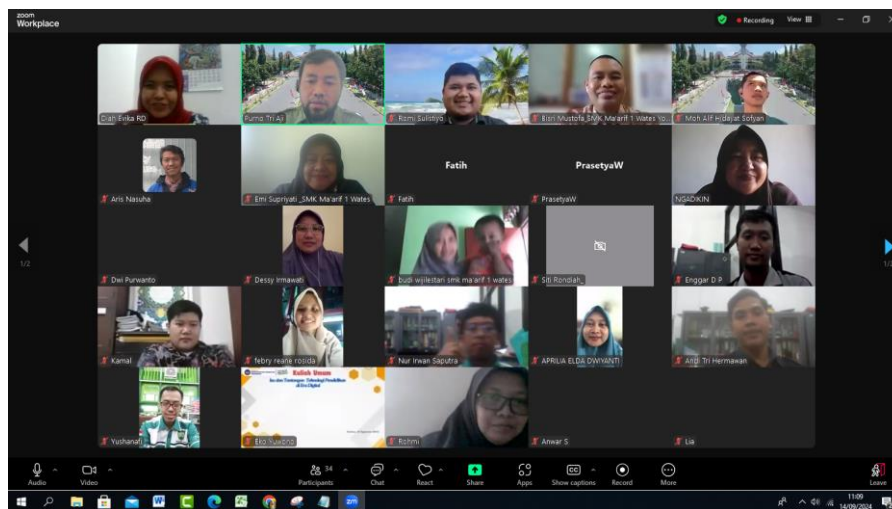

Figure 2. Participants Presented Their Final Work Via Zoom

At the end of the training activity, participants provided their feedback through a structured post-test aimed at evaluating the overall effectiveness of the session. The post-test was administered in the form of a comprehensive questionnaire, where participants rated their experience using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This approach enabled a detailed assessment of the participants' perspectives on various aspects of the training. The post-test was conducted entirely online using Google Forms, making it easily accessible to all participants and ensuring a smooth data collection process. The post-test scores for each criterion are presented in Table 1.

Tabel 1. The Scores of The Post-Test Results for Each Criterion

Criteria	Score of 5
Quality of Material and Instructor	4.3
Usefulness of Material for Teachers	4.5
Teachers' Skill Level and Understanding in Using ChatGPT and AI	4.4
Teachers' Satisfaction Level During the Training	4.3

In this post-test, participants were asked a series of questions designed to measure four main dimensions of the training. The first dimension is material and instructor quality, which includes evaluations of the clarity, relevance, and depth of the material and the instructor's ability to deliver the material, interact with participants, and answer questions. This assessment ensures that the materials and the facilitator's teaching style meet participants' expectations. Furthermore, the usability aspect of the materials for teachers focused on the practical application of the materials and AI tools such as ChatGPT in the teaching context, whether in lesson planning, student assessment, or increasing student engagement in the classroom. The next dimension highlights teachers' skill level and understanding of ChatGPT and AI. This parameter measures participants' confidence and technical competence, especially in creating lesson content, assessments, and interactive presentations using AI. The aim is to see how much the training has improved their digital literacy and technical skills. Finally, participant satisfaction during the training is measured by assessing the structure, organization, and interactive elements provided. This evaluation

covers the entire participant experience, from the registration process to support during practical sessions, to ensure the training offers valuable insights and meets their expectations.

Discussion

The training on the use of ChatGPT and AI applications for developing learning media yielded significant results for enhancing teachers' skills at SMK Ma'arif 1 Wates. The majority of participants expressed a positive response towards the program, as reflected in the post-training assessments. The quality of the materials and trainers received a score of 4.3 out of 5, suggesting that while the content and presentation were well-received, there is still room for improvement in delivering the training more effectively. The high level of engagement from participants, as evidenced by their active participation during the sessions, indicates the relevance and applicability of the materials to their teaching context. The usefulness of the materials for teachers was rated at 4.5, highlighting that the training successfully addressed the needs of the educators. The tools and methods provided, such as creating interactive learning materials using ChatGPT, were deemed highly beneficial for improving the quality of their teaching. In terms of skill development and understanding of ChatGPT and AI, teachers scored 4.4, indicating that the training significantly improved their ability to use these technologies in their classrooms. This suggests that while the training made a substantial impact, further development or follow-up programs may enhance their proficiency in AI-assisted learning. This supports the findings of research conducted by other researchers who state that improving teachers' digital literacy and AI competencies can be achieved through teacher professional development training (Ding et al., 2024; Kitcharoen et al., 2024; Montenegro-Rueda et al., 2023; Nguyen et al., 2024)

Finally, overall satisfaction during the training scored 4.3, reflecting a positive experience among the participants, although there are some areas that need to be refined to ensure an even higher level of satisfaction. In summary, the training effectively improved teachers' competency in using AI tools, fostering a better understanding of how these technologies can be utilized to create engaging and interactive learning experiences. This is in line with research findings conducted by other researchers who state that, in the era of digital transformation and Society 5.0, teachers must improve their competencies in (Anwar, 2024; Pramono et al., 2023; Sarkar et al., 2023; Yulianto, 2021). However, continuous support and more in-depth training on advanced AI functionalities may further boost the program's effectiveness. The training program presented a comprehensive approach by integrating various AI tools like ChatGPT, Text-to-Speech, Canva, and Adobe Express. This helped teachers develop interactive and engaging learning materials, aligning with the needs of Education 4.0 and equipping teachers with necessary digital skills. The study significantly improved teachers' digital literacy and skills in using AI for creating digital learning media. It directly contributed to enhancing the quality of the learning process at vocational high schools (SMKs), leading to more interactive and effective teaching materials. The successful implementation suggests that similar training programs can be expanded across other vocational schools to elevate digital literacy on a broader scale. The project also demonstrates the potential of AI to support and optimize teaching practices, contributing to a digital transformation in education. While the training improved teachers' competence, the study highlighted that ongoing support and advanced training in AI applications are necessary to sustain and further develop these skills. Future studies could explore more in-depth training programs that cover advanced AI functionalities. Additionally, longitudinal research might assess the long-term impact of AI integration on teaching practices and student outcomes in vocational education.

4. CONCLUSION

A training program designed to improve vocational high school teachers' competence in utilizing ChatGPT and AI applications for learning media development has yielded positive results. The training emphasized improving digital literacy and teaching skills, focusing on using AI to create creative teaching materials, such as videos and interactive modules. The training enhanced teachers' ability to integrate AI into their teaching practices. The participants showed significant improvements in the quality and usability of the materials developed and their technology-based teaching skills. In addition, they felt more confident in using AI for lesson planning and assessment processes. After the training, the mentoring phase provides ongoing support for the teachers to apply the skills they have learned. The result is that teachers can develop and present teaching materials equipped with AI technology, reflecting their increased proficiency. Overall, the program equips teachers with relevant skills to face the challenges of Education 4.0 and encourages a culture of innovation among educators. Teachers are better equipped to adapt to educational technological developments with these skills.

5. ACKNOWLEDGE

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