



Improving Teachers' Digital Literacy Through Training in The Preparation of Teaching Modules with The AI Platform

Muhammad Yakob^{*}, Ahmad Fauzi Syahputra Yani, Mentari Darma Putri
Faculty of Teacher Training and Education, Universitas Samudra, Indonesia.

^{*}Corresponding Author. Email: myakob_mhum@unsam.ac.id

Abstract: This community service activity aims to improve the digital literacy of SMP Negeri 1 Rantau Selamat teachers through training in the preparation of teaching modules by utilizing AI technology. The methods used in this PKM activity were planning through surveys and interviews, socialization, and training in the preparation of teaching modules by utilizing AI technology. The socialization and training activities involved 28 teachers of SMP Negeri 1 Rantau Selamat, Aceh Tamiang, Aceh Province as participants. The pretest and post-test results of the participants, namely 74 and 88, respectively, showed an increase in teachers' understanding of the development, potential, and utilization of AI technology in preparing teaching modules for the Merdeka curriculum. The questionnaire results also showed a positive impact on this PKM activity and were shown by the enthusiasm and support of the school for the implementation of this PKM activity.

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Introduction

The era of Society 5.0 is characterized by the rapid advancement and utilization of technology in various fields, including education (Shahidi et al., 2024). The technology referred to in this context encompasses digital media technology, as well as information and communication technologies. The ability to master and effectively utilize digital technology is known as digital literacy (Abidin, 2023). Teachers in the era of Society 5.0 must possess strong digital literacy skills to avoid being outpaced by their students (Muyassaroh et al., 2022). This is particularly important as students in this era are accustomed to using digital technology. Assignments from teachers can be completed easily with the aid of digital tools. Therefore, teachers need to develop and nurture their digital literacy skills (Nurmawati B. et al.). Teachers who are proficient in digital literacy can leverage various technologies to enhance the quality of their teaching. They can create interactive learning materials, utilize digital resources, and guide students in developing the digital skills necessary to face future challenges (Hambali et al., 2023). As a result, teachers will find it easier and more effective to deliver subject matter. Conversely, digital literacy for learners extends beyond mere technical skills; it also involves the ability to manage information effectively, critically evaluate online content, and maintain digital safety. In an increasingly connected world, digital literacy is not just an additional skill but a necessity for teachers and learners to engage actively, productively, and safely with technology for learning and daily life (Suryani S. et al., 2023).

Although technology has become an inevitable part of modern education, there are still serious challenges related to low digital literacy skills among school teachers (Falloon,



G. 2020). Many teachers have not fully mastered the technological skills necessary to utilize the full potential of digital media in the teaching process (Prayogi, 2020). Factors such as lack of adequate training, limited access to digital devices and infrastructure, and uncertainty regarding online safety all contribute to low levels of digital literacy among teachers (Puspita P. et al., 2023). This may hinder their ability to create innovative and technologically relevant learning environments. Therefore, greater efforts need to be made to improve teachers' digital literacy so that they can face the demands of the times more confidently and effectively in guiding learners into an increasingly advanced digital era.

Based on the results of interviews conducted with the Principal of SMP Negeri 1 Rantau Selamat, Aceh Tamiang, information was obtained that: 1) teachers' digital literacy is still low, as evidenced by the lack of digital-based learning innovations; 2) there is limited access to school infrastructure, including slow internet connections and a shortage of devices; 3) there is a lack of adequate training in the use of technology, resulting in insufficient understanding of how to effectively integrate technology when preparing learning tools; and 4) some teachers may feel afraid or lack confidence in using technology, leading them to avoid incorporating it into their teaching.

This community service activity aims to improve the digital literacy of the teachers at SMP Negeri 1 Rantau Selamat by providing socialization and technical guidance in the use of AI (Artificial Intelligence) through the ChatGPT and Gemini applications. This service activity is crucial, as digital literacy skills are essential for teachers in the 21st century. Teachers with strong digital literacy skills can effectively integrate technology into their learning activities. In particular, mastery of artificial intelligence technology can enhance learning effectiveness and support innovative and interactive approaches. This community service activity was carried out collaboratively by lecturers from the Indonesian Language Education, Chemistry Education, and Physics Education Study Programs at the Faculty of Teacher Training and Education, Universitas Samudra. This collaboration took place considering the diverse scientific backgrounds of the participants, highlighting the need for multidisciplinary cooperation. Additionally, this collaboration is expected to contribute to the holistic development of learning technology.

Method

The method of implementing this community service activity consists of three stages: 1) Planning, 2) Implementation, and 3) Monitoring and Evaluation. Activities were carried out in stages, starting with planning on July 27, 2024, followed by the implementation, monitoring, and evaluation stages on August 20, 2024, at SMP Negeri 1 Rantau Selamat, Aceh Tamiang, Aceh Province. The participants in the activity were 28 teachers from SMP Negeri 1 Rantau Selamat.

The planning stage is the first phase of this series of community service activities. At this stage, surveys and interviews were conducted at SMP Negeri 1 Rantau Selamat. The survey involved distributing questionnaires to teachers to gather information about their digital literacy skills, specifically their understanding, skills, and utilization of Artificial Intelligence technology in preparing learning tools. Interviews were also conducted with the Principal, who acts as the school manager, to obtain more detailed data on the condition of AI digital literacy utilization by teachers.

The second stage is implementation. This phase consists of socialization activities and training in preparing learning tools using AI technology, specifically the ChatGPT and Gemini applications. The socialization activities began with opening remarks by the head of



the service team, followed by comments from the Principal of SMP Negeri 1 Rantau Selamat. Subsequently, the service team presented the use of AI technology in preparing learning tools, followed by a question-and-answer discussion about the potential, advantages, and disadvantages of AI technology in this context.

The third stage, marking the end of the series of activities, is monitoring and evaluation. This stage involved administering a pretest and post-test of 20 questions to the participants. The pretest was given before the socialization activity, and the post-test was administered after the training (Andriani & Wiza, 2023). The results of both the pretest and post-test were averaged to assess the increase in teachers' digital literacy regarding the development, potential, and utilization of AI technology in preparing teaching modules for the Merdeka curriculum. Additionally, a response questionnaire was provided to participants to evaluate the implementation, satisfaction, and sustainability of the program. The questionnaire consisted of 10 questions, and participants were asked to respond using the following options: strongly disagree (STS), disagree (TS), agree (S), and strongly agree (SS). Each question's responses were calculated as a percentage to determine the overall conclusion regarding the implementation of the service activities.

Result and Discussion

The implementation stage of community service activities was opened by the head of the service team, Mr. Muhammad Yakob, S.Pd., M.Hum. followed by remarks by the Principal of SMP Negeri 1 Rantau Selamat, Mrs. Roslina, S.Pd. Mrs. Roslina received the service team well and stated that this service activity was needed to improve digital literacy skills to support the performance of the teachers she led. This activity will increase the distribution of training in the field of digital literacy to teachers at SMP Negeri 1 Rantau Selamat so that teachers can better understand and make the best use of technological advances, especially AI. In addition, this training will help teachers have qualified skills to prepare students to face challenges in the digital era (Yunefri et al., 2023).

Before the socialization activities were carried out, the teachers were given a pre-test of 20 questions to find out the teachers' initial knowledge of learning tools in Merdeka curriculum and teachers' digital literacy regarding Artificial Intelligence technology. The next activity is a socialization activity carried out by the service team by providing material about Merdeka curriculum learning tools and the use of AI technology in preparing learning tools. The socialization materials are: (1) Learning tools on Merdeka curriculum. (2) Teaching modules for Merdeka curriculum. (3) Definition of Artificial Intelligence. (4) The potential of artificial intelligence (AI) to improve learning. (5) AI platforms in Education. (6) Utilization of Chat GPT and Gemini AI in developing Merdeka curriculum teaching modules.



Figure 1. Socialization of Artificial Intelligence Technology for Developing teaching modules.



After the socialization material, training activities on preparing learning tools utilizing AI technology continued. The learning tools emphasized in this training are teaching modules. Teaching modules were chosen as the main topic because they represent a new approach to the Merdeka curriculum (Jannah & Irtifa'Fathuddi, 2023). As a substitute for lesson plans in the previous curriculum, teaching modules require adjustment and optimization to align with the latest curriculum and current conditions, ensuring that classroom learning is maximized. The AI technologies used in the training activities are the ChatGPT and Gemini AI applications. Both ChatGPT and Gemini AI are relevant tools that facilitate the process of compiling and locating learning resources (Zhai et al., 2021). Additionally, these applications can assist teachers in designing interactive learning scenarios and fostering discussions in the classroom through the integration of various learning models (Jumriah et al., 2024). Thus, teachers can more easily innovate when preparing learning tools



Figure 2. Chat-GPT and Gemini AI utilization training.

Before compiling the teaching module, the service team instructed us to open and log in to the Chat-GPT and Gemini AI platforms. In the process, the service team recommends logging in using each teacher's belajar.id account to optimize the use of the account. The service team also directly assisted in the login process if teachers had difficulty logging in to the Chat-GPT and Gemini AI platforms.

After all teachers logged in to the Chat-GPT and Gemini AI platforms, the next step was for the service team to explain the appearance and features of the Chat-GPT and Gemini AI platforms. Both platforms were opened at once so that teachers could compare the output of the two platforms when given the same command sentence. Then, the service team gave examples of command sentences that could be given to produce teaching modules. In the process, one of the teachers also gave suggestions by telling the subjects taught and the material that they wanted to make teaching modules. After knowing how it works, the teachers then type the command sentences to produce teaching modules on the Chat-GPT and Gemini AI platforms on their respective laptops. The best output from Chat-GPT and Gemini AI was then compared and copied to the document for improvement according to the conditions of teachers, students, and school facilities.

Based on the output produced by the two applications, the teacher concluded that Chat-GPT's output was more detailed than Gemini AI in several aspects. The aspects in question were complete syntax with time allocation and examples. However, Gemini AI can also do the same if given additional command sentences. This is in accordance with the statement from Penicig et al., (2024) which states that Chat-GPT is effective in producing coherent and natural text.

The last activity of the implementation stage is monitoring and evaluation. This activity was carried out by giving post-test questions and surveys on the implementation of service activities. The post-test results showed an increase in the digital literacy of teachers

about the development, potential, and utilization of AI technology in the preparation of teaching modules for the Merdeka curriculum. This increase can be seen from the average pretest score of 74 and the average post-test score of 88.

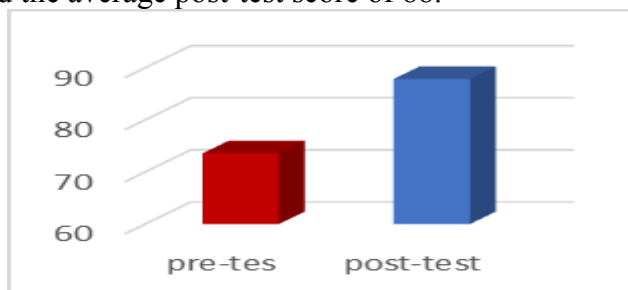


Figure 3. Average pretest and post-test scores

The teachers of SMP Negeri 1 Rantau Selamat also responded well during the socialization activities. This can be seen from the results of filling out the questionnaire conducted after the training. Based on the results of filling out the questionnaire, it can be seen that the majority of teachers are satisfied with the service activities carried out. This is evidenced by the majority of teachers agreeing and strongly agreeing with the questionnaire items. The result based on the questionnaire are: (1) The teachers of SMP Negeri 1 Rantau Selamat were satisfied and felt that the service activities were as expected. (2) SMP Negeri 1 Rantau Selamat teachers considered the training materials relevant, easy to understand, and able to improve teachers' digital literacy. (3) SMP Negeri 1 Rantau Selamat teachers are confident in using AI technology in developing learning tools.

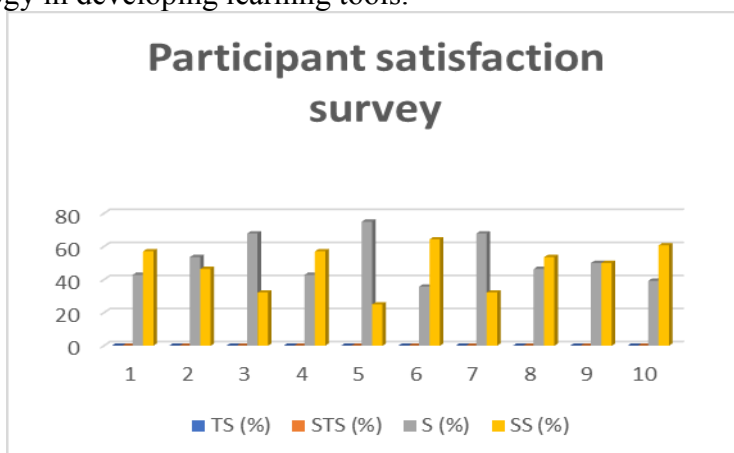


Figure 4. Participant satisfaction questionnaire

This service activity has significant implications for the digital literacy skills of SMP Negeri 1 Rantau Selamat teachers, especially in using artificial intelligence technology, as evidenced by the increase in the average scores of teachers' pretests and post-tests. Teachers become more skilled in utilizing this technology, especially in compiling Merdeka Curriculum teaching modules. This has a direct impact on the quality of teaching and the readiness of teachers in implementing the Merdeka curriculum. In addition, teachers can also adapt to technological developments and prepare students for the challenges of the digital world.

Conclusion

The conclusion obtained from the result of this service is the increasing digital literacy skills of teachers. This is evidenced by the teachers' increased understanding of the development,



potential, and utilization of artificial intelligence technology chat GPT and Gemini AI in the preparation of Merdeka curriculum teaching modules. This is evidenced by the increase in the average results of participants' pretests and posttests from 74 to 88. The questionnaire results also show a positive impact on this PKM activity and are shown by the enthusiasm and support of the school for the implementation of this PKM activity.

Recommendation

The research team advises teachers who have received training to be able to further utilize AI technology (Chat-GPT and Gemini AI) in developing learning tools, especially teaching modules. Teachers should consistently practice developing learning tools and integrating them into learning. Teachers can collaborate to share experiences and effective ways to utilize the features of Chat GPT and Gemini AI. In addition, teachers are also advised to use other artificial intelligence technologies besides Chat GPT and AI to improve learning innovation and digital literacy skills.

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