

# Assistance In the Preparation of Teaching Modules Based on Problem Solving Integrated with Character by Utilizing Artificial Intelligence to Junior High School Teachers

Nurhafidhah<sup>1\*</sup>, Mauliza<sup>1</sup>, Ahmad Fauzi Syahputra Yani<sup>1</sup>

<sup>1</sup> Chemistry Education Study Program, Samudra University, Langsa, Indonesia

Received: January 27, 2025

Revised: March 15, 2025

Accepted: March 25, 2025

Published: March 31, 2025

Corresponding Author:

Nurhafidhah

[nurhafidhah@unsam.ac.id](mailto:nurhafidhah@unsam.ac.id)

DOI: [10.29303/ujcs.v6i1.884](https://doi.org/10.29303/ujcs.v6i1.884)

© 2025 The Authors. This open access article is distributed under a (CC-BY License)



**Abstract:** In the Merdeka Curriculum, one of the stages of lesson planning is the preparation of teaching modules. Teaching modules replace the Lesson Plan (RPP) that teachers typically prepare before teaching. Results from interviews with the principal of SMP Negeri 2 Idi Timur revealed two problems: 1) many teachers still do not understand the principles and structure of preparing teaching modules for the Merdeka Curriculum due to limited intensive training they have participated in for module preparation, and 2) teachers' skills in integrating a learning model with Artificial Intelligence (AI) into the teaching module are still lacking. The urgency of this community service lies in the need to optimize teachers' professional competence by providing training on the preparation of teaching modules based on a character-integrated problem-solving model using Artificial Intelligence (AI). The results of the community service activity showed that 40% of participants were very satisfied with the quality of guidance provided in the preparation of character-integrated problem-solving teaching modules using AI, while 45% and 15% were satisfied and somewhat satisfied, respectively. In another question, 60% of participants stated that the guidance helped improve their understanding of teaching modules and the use of AI.

**Keywords:** Artificial Intelligence; Character; Teaching Module; Problem Solving

## Introduction

Education is an important foundation in the formation of a quality generation. However, there are still many challenges in the learning process at both formal and non-formal education levels, especially in terms of preparing relevant and interesting learning materials for students. An approach that has been proven effective in improving the quality of learning is by applying a problem-solving model, which encourages students to actively think, collaborate, and face challenges (Zai et al., 2023). This model can also be one of the right models to use in the current conditions. Conditions where Indonesian education is trying to rise from the impact of Covid-19 with one of its efforts, namely implementing the Merdeka Curriculum (Ariga, 2023). A curriculum that emphasizes mastery of

competencies, development of creativity, and student empowerment.

In addition, strengthening character is also an important aspect of education, given the importance of forming good morals and ethics in the younger generation. This is in accordance with the character education that is being implemented in education in Indonesia, namely the Pancasila Student Profile (Zulaiha et al., 2023). The profile of Pancasila students are: 1) faithful and devoted to God Almighty, and noble; 2) global diversity; 3) cooperation; 4) creative; 5) critical reasoning; and 6) independent (Iskandar et al., 2023). Problem solving as an integrated model of character is very suitable for developing the Pancasila Student Profile, through activities 1) Olah heart in accordance with faith and piety to God Almighty, and noble character; 2) Mind in accordance with creative and critical reasoning; 3) Exercise in accordance with

## How to Cite:

Nurhafidhah, N., Mauliza, M., & Yani, A. F. S. (2025). Assistance In the Preparation of Teaching Modules Based on Problem Solving Integrated with Character by Utilizing Artificial Intelligence to Junior High School Teachers . *Unram Journal of Community Service*, 6(1), 260-265. <https://doi.org/10.29303/ujcs.v6i1.884>

independence; and 4) Exercise is in accordance with mutual cooperation and global diversity. Therefore, the preparation of teaching modules that not only prioritize concept learning, but also integrate character building is very relevant and needed in the current conditions. Especially teaching modules based on problem solving that integrate character education.

Teaching modules are one of the learning tools that teachers must prepare in schools that implement the Merdeka curriculum (Noviantari & Agustina, 2022). Of course, this teaching module is a new thing and there are still many teachers who have not mastered its preparation considering that the Merdeka curriculum has only been implemented for the past 3 years. In its preparation, the teaching module accommodates the learning outcomes (CP) determined by the Government. Based on these learning outcomes, teachers will determine learning objectives, learning content, teaching module structure, appropriate approaches, integrate their resources, practice and assessment, feedback and carry out evaluations (Anjelia et al., 2024). On the other hand, with the rapid development of technology in the Era of Society 5.0, it has the potential to simplify the work of teachers. Artificial Intelligence (AI) technology is one of the technologies that will simplify the work of teachers and increase teacher creativity in the learning process (Zhao, 2022). With AI technology, teachers can obtain information or data with a command. Of course this will help the teacher's work, especially in compiling teaching modules.

Pedagogical competence is one of the professional competencies that a teacher must have. One of the pedagogical competencies that a teacher must have is the ability to design learning (Koswara & Rasto, 2016). In the Merdeka curriculum, the government, in this case the Ministry of Education and Culture Research and Technology, requires teachers to have the ability to design learning by compiling teaching modules. Teaching modules will help teachers determine learning objectives, learning content, teaching module structure, appropriate approaches, integrate their resources, practice and assessment, feedback and carry out evaluations so that the demands of the Merdeka Curriculum, namely mastery of competencies, development of creativity, and empowerment of students, become directed. That way teachers will teach more effectively, efficiently, and lead to achievement indicators (Maulida, 2022). The results of the interview with the Principal of SMP Negeri 2 Idi Timur obtained several important points, namely: 1) The school has implemented the Merdeka Curriculum in grades VII to IX; 2) Teachers who teach in grades VII to IX are required to compile teaching modules; 3) Limited knowledge and skills of teachers in the systematic preparation of teaching modules; 4) Most teachers have not integrated

learning models that are in accordance with the characteristics of the Merdeka curriculum such as the problem solving model. 5) Teachers' skills in utilizing AI technology in lesson planning are still low. Therefore, training activities on the preparation of teaching modules based on problem solving integrated with character utilizing AI technology are needed as a solution to these problems.

## Method

Community service activities (PKM) were carried out at SMP Negeri 2 Idi Timur. The participants involved in this PKM activity totaled 21 people who were teachers at SMP Negeri 2 Idi Timur. The purpose of this activity is to optimize teacher competence in developing teaching modules integrated with problem solving by utilizing AI technology.

Broadly speaking, the stages of implementing this activity consist of 1) planning, 2) socialization and training on the preparation of integrated problem solving teaching modules using AI, and 3) monitoring and evaluation. In the planning stage, the PKM team conducted a survey to see conditions in the field regarding the availability of teaching modules based on problem solving integrated with character and the problems faced related to the implementation of teaching modules in learning in groups of teachers at SMP Negeri 2 East Idi. The PKM team also coordinated with the principal regarding the implementation schedule and equipment needed.

In this second stage, PKM will be carried out with socialization activities and training in the preparation of teaching modules based on problem solving integrated with character by utilizing AI technology. The steps are as follows:

### a. Socialization

The material socialized is the Merdeka Curriculum, teaching modules, systematic preparation of teaching modules, problem solving models, character values in problem solving and conformity with the Pancasila Student Profile, application of character-integrated teaching models in teaching modules, utilization of AI technology in compiling teaching modules.

### b. Training

This activity is carried out by direct practice in developing Teaching Modules for the Merdeka Curriculum integrated with problem solving by utilizing AI technology. Teachers work in groups and are guided by the PKM team in its implementation. The teaching modules that have been developed are collected by the PKM team to be analyzed and given improvements.

The last stage, monitoring and evaluation, is an activity carried out to measure the achievement indicators of each PKM activity. The instruments used are questionnaires of activity participants' responses, pretest and posttest questions on teacher knowledge assessment before and after training, observation sheets of activity implementation, and teacher skill questionnaires. The results of monitoring and evaluation will be used as a reference for the next activity. To ensure the sustainability of the activity, the PKM team communicates by forming a WA group to discuss obstacles and matters that develop in the activity.

## Results and Discussion

This service activity aims to increase the knowledge, understanding and skills of SMP Negeri 2 Idi Timur teachers so that in the future SMP Negeri 2 Idi Timur teachers can disseminate the results of the training to their respective MGMP groups. The targets/indicators to be achieved include: (a) teachers of SMP Negeri 2 Idi Timur responded well during the socialization of the preparation of teaching modules based on problem solving integrated with character using AI technology; (b) the socialization of the preparation of teaching modules based on problem solving integrated with character for teachers of SMP Negeri 2 Idi Timur using AI technology was carried out until completion; (c) there is an increase in teacher knowledge at SMP Negeri 2 Idi Timur about teaching modules based on problem solving integrated character; (d) there is an increase in teacher skills in preparing teaching modules utilizing AI technology; (e) there is active teacher involvement during training in preparing teaching modules based on problem solving integrated character utilizing AI technology; (f) there is an increase in teacher skills in implementing teaching modules based on problem solving integrated character. In stages, the results of community service activities are as follows.

### a. Socialization

The opening of the event began with remarks from the school principal, school supervisor, and PKM team leader. The socialization of teaching modules based on problem solving integrated with character was delivered by the implementation team through an interactive lecture method using Power Point media and demonstrations. In the socialization, the team stated the advantages of problem solving, which is effective in improving students' critical and analytical thinking skills. Students will also be more actively involved in learning (Mauliza et al., 2022). The results of the socialization showed high enthusiasm from the participants. This can be seen from the high interaction of participants' questions and answers during the discussion.



**Figure 1.** Socialization of teaching Modules Based on Problem Solving Integrated with Characters

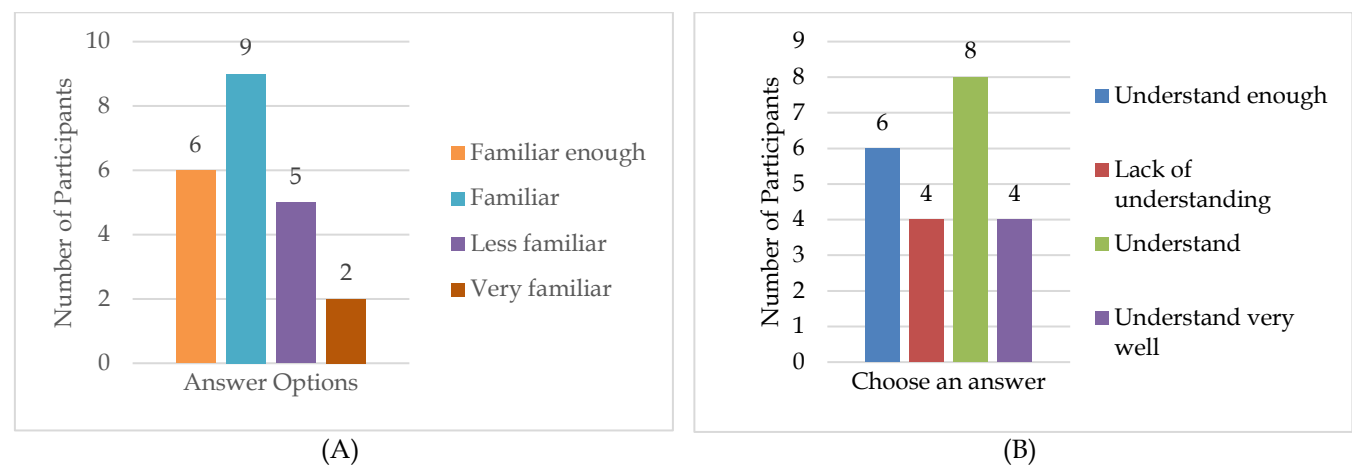
Based on the initial survey before socialization, only 2 out of 22 participants stated that they were very familiar with the concept of teaching modules based on problem solving integrated with character, while the other 5 participants stated that they were less familiar (Figure 3). Similarly, related to participants' understanding of how to integrate character development in a teaching module, 4 out of 22 participants stated that they did not understand and only 4 participants stated that they understood very well (Figure 3).



**Figure 2.** Socialization material for teaching modules based on problem solving integrated with character

After the socialization, through the post-test, it was known that participants already knew the first step that must be taken in the preparation of teaching modules based on problem solving integrated with character, namely identifying problems that are relevant to the context of students (Nurhafidhah et al., 2024). In

addition, all participants answered correctly on post-test questions related to the main benefits of integrating character development in problem solving-based teaching modules, namely building critical thinking skills and student character (Mauliza et al., 2022).

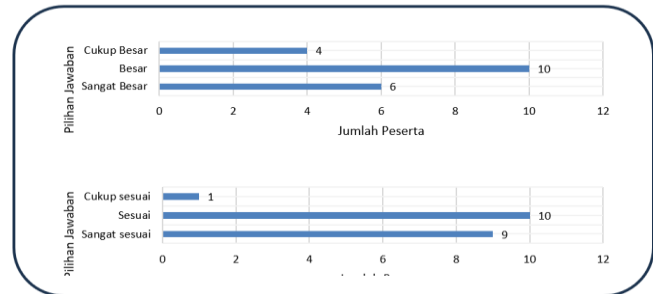


**Figure 3.** Teachers' understanding (A) of the concept of teaching modules based on problem solving integrated with character (B) integrating character development in a teaching module

Teachers of SMP Negeri 2 Idi Timur responded well during the socialization of the preparation of teaching modules based on problem solving integrated with character using AI technology. The good response is known from the participants' answers to the post-test question about how likely the participants will use the character-integrated problem solving method in teaching activities after this training. Based on Figure 4, 6 out of 22 participants stated that it is very likely to use the character-integrated problem solving method in teaching activities. In another question, all participants stated that the material provided during the mentoring was in accordance with their needs. Finally, the socialization of the preparation of teaching modules based on problem solving integrated with character for teachers of SMP Negeri 2 Idi Timur using AI technology was carried out to completion according to the planned time.

b. Training

In this activity, the service team together with students provided guidance to participants in groups to practice the use of AI. Participants in groups practiced developing teaching modules based on problem solving integrated with character. Questions and answers and guidance were given directly to participants to clarify parts that were not yet understood. Some participants asked how to streamline the command sentences in the use of AI so that the teaching modules were arranged according to the wishes of the participants. Based on these questions, the service team answered that the use of detailed and specific command sentences will be in the use of AI (Youvan, 2024). In addition, the team shared experiences using various types of AI to innovate and optimize the preparation of teaching modules by utilizing AI technology.



**Figure 4.** Participants' responses to the socialization of the preparation of teaching modules based on problem solving integrated with character using AI technology



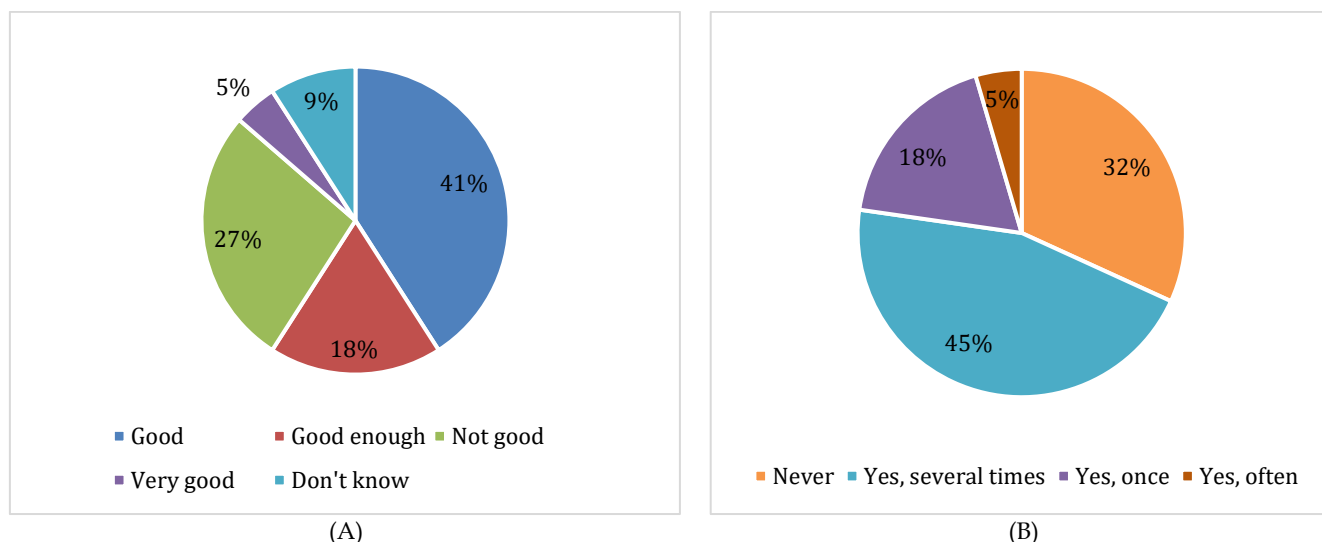
**Figure 5.** Practical use of AI in the preparation of teaching modules based on problem solving integrated with characters

Before the training, a survey showed that 41% of participants had a good understanding of the use of Artificial Intelligence (AI) in learning (Figure 6). As a



result, the training activities could run well and interactively. Similarly, participants' experience in using AI. 45% of participants stated that they had used AI-

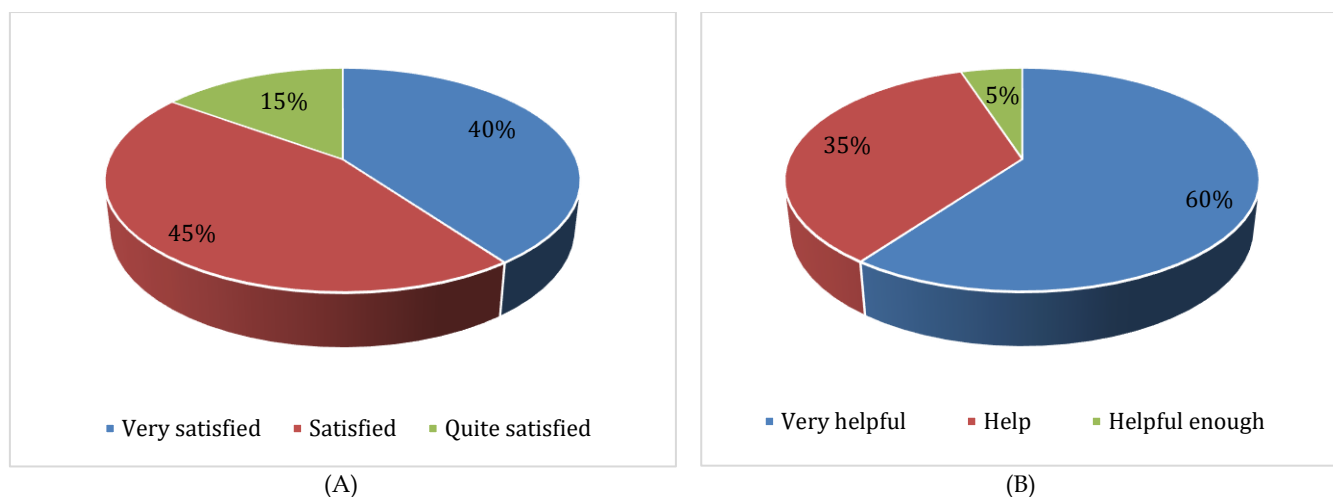
based tools or applications several times to support classroom learning (Figure 6).



**Figure 6.** (A)Participants' experience on the use of AI in learning (B)Participants' general understanding on the use of AI in learning

The improvement of teachers' skills in developing teaching modules utilizing AI technology and the active involvement of teachers during the training are known from the teaching module products prepared by participants in groups. In addition, participants responded well to the post-test results after the training activities. 40% of participants stated that they were very satisfied with the quality of assistance provided in the

preparation of teaching modules based on problem solving integrated with character by utilizing artificial intelligence, while 45 and 15% of others stated that they were satisfied and quite satisfied. In another question, 60% of participants stated that mentoring helped improve their understanding of teaching modules and the use of AI (Figure 7).



**Figure 7.** Participants' responses to the results of training activities Practical use of AI in the preparation of teaching modules based on problem solving integrated character (A) Satisfaction (B) Helpability

## Conclusion

Community service activities, regarding assistance in preparing teaching modules based on problem solving integrated with character by utilizing Artificial

Intelligence (AI) at SMP Negeri 2 Idi Timur have run well and interactively and can increase the knowledge and skills of SMP Negeri 2 Idi Timur teachers in preparing teaching modules by utilizing AI. Based on the results of questionnaire data analysis, it is known

that 40% of participants stated that they were very satisfied with the quality of assistance provided in the preparation of teaching modules based on problem solving integrated with character by utilizing artificial intelligence, while 45 and 15% others stated that they were satisfied and quite satisfied. In another question, 60% of participants stated that this mentoring helped improve your understanding of teaching modules and the use of AI.

### Acknowledgments

Thanks to the parties who have played a role and helped the implementation of this PKM activity including: 1) Samudra University PKM Team; 2) Institute for Research and Service-Quality Assurance (LPPM-PM) of Samudra University; 3) Teachers of SMP Negeri 2 Idi Timur

### References

- Anjelia, B., Umami, R., Octavury, Y., Hidayat, S., Saputri, W., & Sidik, B. R. (2024). Analisis Persepsi Guru dalam Kajian Perbandingan Efisiensi terkait RPP pada Kurikulum 13 dan Modul Ajar pada Kurikulum Merdeka. *Diklabio: Jurnal Pendidikan dan Pembelajaran Biologi*, 8(2), 246-260. <https://doi.org/10.33369/diklabio.8.2.246-260>
- Ariga, S. (2022). Implementasi kurikulum merdeka pasca pandemi covid-19. *Edu Society: Jurnal Pendidikan, Ilmu Sosial Dan Pengabdian Kepada Masyarakat*, 2(2), 662-670. <https://doi.org/10.56832/edu.v2i2.225>
- Iskandar, S., Rosmana, P. S., Luthfiyyah, R. Z., Amelia, S., Maulidawanti, D., & Fauziyah, N. N. (2023). Peningkatan karakter anak bangsa dalam kurikulum merdeka melalui program profil pelajar Pancasila. *Innovative: Journal of Social Science Research*, 3(2), 2729-2742. <https://doi.org/10.53870/inno.v3i2.2729>
- Koswara, K., & Rasto, R. (2016). Kompetensi dan kinerja guru berdasarkan sertifikasi profesi. *Jurnal pendidikan manajemen perkantoran*, 1(1), 61-71. <https://doi.org/10.17509/jpm.v1i1.3269>
- Maulida, U. (2022). Pengembangan modul ajar berbasis kurikulum merdeka. *Tarbawi: Jurnal Pemikiran dan Pendidikan Islam*, 5(2), 130-138. <https://doi.org/10.51476/tarbawi.v5i2.392>
- Mauliza, M., Nurhafidhah, N., & Hariadi, J. . (2022). Needs Analysis: Development of Character-integrated Problem Solving Model for Chemistry Lessons in Senior High Schools. *Jurnal Penelitian Pendidikan IPA*, 8(1), 336-340. <https://doi.org/10.29303/jppipa.v8i1.1053>
- Noviantari, I., & Agustina, D. A. (2022). Development of teaching modules on independent curriculum implementation. In *Social, Humanities, and Educational Studies (SHES): Conference Series* (Vol. 6, No. 1, pp. 465-470). <https://doi.org/10.20961/shes.v6i1.71154>
- Nurhafidhah, N., Mauliza, M., Yani, A., Aprilia, R., Zaty, I., & Wan Mustapha, W. (2024). Development of Teaching Module Based on the Merdeka Curriculum with the Application of Character Integrated Problem Solving Model. *Jurnal Pendidikan Sains Indonesia*, 12(3), 478-492. [doi:https://doi.org/10.24815/jpsi.v12i3.37750](https://doi.org/10.24815/jpsi.v12i3.37750)
- Zhao, T. AI in Educational Technology. *Preprints 2023*, 2023110106. <https://doi.org/10.20944/preprints202311.0106.v1>
- Youvan, D. C. (2024). Designing an Optimal Synthetic Language for AI: A Framework for Efficient, Multimodal, and Precise Communication.
- Zai, S., Mendrofa, R. N., & Zega, Y. (2023). Pendekatan yang telah terbukti efektif dalam meningkatkan kualitas pembelajaran adalah dengan menerapkan model problem solving, yang mendorong siswa untuk aktif berpikir, berkolaborasi, dan menghadapi tantangan. *Aurelia: Jurnal Penelitian dan Pengabdian Masyarakat Indonesia*, 920-926. <https://doi.org/10.35870/aur.v4i1.920>
- Zulaiha, S., Meisin, M., & Meldina, T. (2023). Problematika guru dalam menerapkan kurikulum merdeka belajar. *Terampil: Jurnal Pendidikan Dan Pembelajaran Dasar*, 9(2), 163-177. <http://dx.doi.org/10.24042/terampil.v9i2.13974>