

Assistance in Designing AI-Based Teaching Materials to Enhance Digital Literacy of Elementary School Teachers

Asri Siti Fatimah¹, Neni Marlina¹, Fera Sulastri¹, Melisa Sri¹, Yuni Ertinawati¹

¹ Universitas Siliwangi, Indonesia

ARTICLE INFO

Keywords:

artificial intelligence;
digital literacy;
elementary school;
teaching materials

Article history:

Received 2026-02-01

Revised 2026-03-01

Accepted 2026-04-05

ABSTRACT

This community service program is designed to enhance the digital literacy skills of teachers at SDN Mугarsari Tasikmalaya through the development of AI-based instructional material design. In today's digital era, the integration of digital technologies in education has become essential. Technology has a significant impact on both teachers and students to improve the quality of learning fostering students' skills and enhancing their learning motivation and self-confidence. However, it is found that many elementary school teachers still face challenges in using technology especially the use of artificial intelligence in developing learning materials. Therefore, continuous mentoring and intensive training are needed, particularly in the use of information technology as a tool for designing learning materials. There are various educational technologies that teachers can use in material design, such as videos, mobile devices, and AI-based applications. The use of artificial intelligence in education has recently become a widely discussed topic. AI-based technology offers great benefits and advantages due to its effectiveness, efficiency, and adaptability. The development of AI-based learning materials such as the use of ChatGPT, Magic School, Canva AI, and Quizizz AI can contribute on the development of learning quality to create more creative and relevant instructional content. This activity is expected to be beneficial to improve teachers' readiness in facing the challenges of 21st-century learning in the future.

This is an open access article under the [CC BY](https://creativecommons.org/licenses/by/4.0/) license.



Corresponding Author:

Asri Siti Fatimah

Universitas Siliwangi, Indonesia; asrisitifatihmah@unsil.ac.id

1. INTRODUCTION

The rapid development of technology today has brought many changes in various aspects of life, including the economy, social interaction, and education. In the field of education, technological advancements have facilitated higher-quality, more enjoyable, and more impactful learning experiences (Fatimah & Santiana, 2017; Naveed et al., 2023; O'Bryan & Hegelheimer, 2007). Technology enables flexible learning that can take place anytime and anywhere, allowing for both personalized and collaborative learning experiences. It also makes learning more engaging through various game-based

and visualization applications. As the spearhead of quality education, teachers also benefit from a wide range of technologies that can be utilized in the teaching process, including educational videos, social media, education-based applications, and artificial intelligence (AI) (Ummah, 2019). Therefore, teachers are required to continuously update their knowledge and skills related to the use of information technology in education.

However, many elementary school teachers, including those at SDN Mugarsari, still face limitations in knowledge and information regarding the use of technology in teaching. In fact, digital literacy is essential for teachers, including those working in elementary schools. Based on interviews and observations conducted at the partner school, most teachers still develop teaching materials manually using existing textbooks and rarely integrate AI-based materials into the learning process. Data show that only 15% of teachers understand and implement the use of AI in designing learning materials. This finding aligns with a study conducted by Diliberti et al. (2024) in the United States which reported that only 18% of teachers regularly use AI in the classroom.

In relation to the importance of digital literacy in supporting more innovative learning, teachers are expected to be lifelong learners who continuously seek new knowledge. Digital literacy plays a crucial role in creating better and more meaningful learning experiences (Haeroni et al., 2023). In the teaching process, teachers are responsible for providing innovative and contextual materials. In this regard, AI-based technology can play an important role. Artificial intelligence has become one of the most impactful technological innovations that can assist teachers in the teaching and learning process. One of the major benefits teachers can gain is the ability to develop learning materials more effectively, attractively, and adaptively based on students' needs. By using AI, teachers can develop materials and teaching resources more easily and quickly.

There are many AI-based applications and websites that teachers can use, such as ChatGPT, Google Gemini, and DeepSeek. With the help of these platforms, teachers can generate ideas for developing learning materials, create summaries, design exercises, and even plan learning activities that match the available resources and students' needs (Nuryadin, 2023). AI technology provides various features that help teachers generate ideas and inspiration for material development for example, when creating concept maps, obtaining textual learning materials, or designing contextual problem-based learning. Furthermore, this technology can assist teachers in developing practice exercises to assess students' understanding of the given materials. Teachers can easily evaluate students' performance without manually analyzing their responses. For instance, with Quizizz AI, teachers can automatically create questions and calculate students' scores. This, of course, makes lesson preparation more effective and efficient.

In addition, there are AI-based websites and applications that can help teachers design visually appealing teaching materials, such as Gamma, Canva AI, and Microsoft Designer. Through these platforms, teachers can create graphic designs, presentation slides, or other visual learning media that are engaging and interactive. In Canva AI, features such as Magic Write and Text to Design allow teachers to quickly and easily create educational posters. By simply typing an idea or topic, the system helps teachers generate complete and aesthetically pleasing visual designs (Febriyanti & Haryanto, 2024). Meanwhile, Gamma enables teachers to create interesting and interactive presentations automatically without having to design each slide manually. The AI features in Gamma make it easy for teachers to generate entire slide decks quickly. Therefore, these technologies not only assist teachers technically but also encourage them to create more contextual, creative, and engaging teaching materials.

In the context of elementary education, the development of AI-based instructional material designs can undoubtedly enhance students' motivation and learning abilities, as elementary school students tend to learn best through play. Therefore, AI technology is highly suitable for addressing the learning needs of students at this level. Considering this situation, lecturers from Universitas Siliwangi were inspired to conduct a community service program titled "Assistance in Designing AI-Based Teaching Materials to Enhance Digital Literacy of Elementary School Teachers". This program was implemented under the

Community-Based Science and Technology Application Program (PPIBM) scheme, organized by the Institute for Research and Community Service (LPPM) at Universitas Siliwangi, Tasikmalaya.

2. METHODS

This community service program is conducted in one of the elementary schools in Tasikmalaya which is SDN Mugarsari. SDN Mugarsari is located in Tamansari district Tasikmalaya City West Java Indonesia. There are 17 teachers and 334 students in this school. To conduct this community program, there are several steps conducted, as follows:

a. Need analysis

This step aims to identify the teachers' need regarding the use of artificial intelligence in developing learning materials. To conduct need analysis, the lecturers firstly distributed questionnaire to all the teachers. This questionnaire was developed based on several indicators namely AI Knowledge, AI Skills, Attitude toward AI, Need and Support. The result of this need analysis served as the foundation for designing the subsequent training and mentoring activities.

b. Discussions with stakeholders

After investigating the teachers' needs on the questionnaire, a discussion session with school stakeholders was conducted via Zoom Meeting. This activity was conducted to explore the potential solutions to the identified issues, particularly the low level of teachers' digital literacy in utilizing technology. This discussion at ensuring the relevance of the program and alignment of the school's objectives.

c. Community Service Program Implementation

The main activity of the program was conducted through training and mentoring designed to help teacher enhance teacher's digital literacy especially on the use artificial intelligence in developing instructional materials. There are several platforms that will be discussed in this program including ChatGPT, Magic school, Canva AI, and Quizizz AI. The training includes theoretical review of the platforms, practical application and teachers' reflection to assist the teachers integrate artificial intelligence use in developing instructional materials.

d. Program Evaluation

The final stage of this program includes evaluating the effectiveness and outcomes of the program. Evaluation is conducted through observation and post training reflection after the program implementation. This stage focused on measuring the effectiveness of the program by observing the use of learning materials in the classroom. In addition, the teachers are also interviewed to know their perception toward the use of artificial intelligent for developing instructional materials

3. FINDINGS AND DISCUSSION

This community service program aims to disseminate knowledge and contribute to the development of community literacy competencies, including digital literacy, which has become increasingly essential in 21st century education. Based on the implementation methods described earlier, the community service activities carried out are as follows:

a. Needs Analysis

Needs analysis was conducted through a questionnaire to identify elementary school teachers' needs regarding the use of artificial intelligence (AI) in developing teaching materials. There are several indicators used to identify the teachers' needs on the use artificial intelligence on developing learning materials. They are AI Knowledge, AI Skills, Attitude towards AI, and Need and Support. The result of questionnaire is as follows:

Table 1.
Need Analysis Result

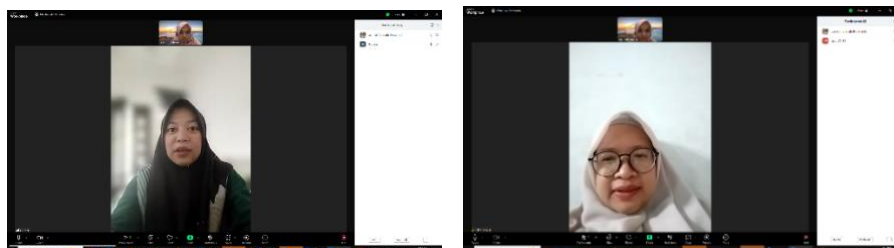
Indicator	Statement	SD	Mean
AI Knowledge	I know what artificial intelligence is	0.51	3.59
	I understand how artificial intelligence can be used to develop teaching materials	0.33	3.88
	I am aware of the different types of artificial intelligence applicable to design instructional material	0.24	3.94
	I understand the advantages and limitations of artificial intelligence in developing teaching materials.	0.39	3.82
AI Skills	I am able to use AI-based applications such as ChatGPT, Canva AI, and MagicSchool to develop teaching materials	0.33	3.88
	I can integrate AI-generated outputs into my existing teaching materials	0.43	3.76
Attitude toward AI	I believe that artificial intelligence can improve the quality of learning	0.49	3.64
	I am interested in using artificial intelligence to develop teaching materials for my classes	0.51	3.58
	I view artificial intelligence as a learning aid, not a threat	0.47	3.70
	I believe that artificial intelligence can help teachers develop teaching materials more easily	0.33	3.88
Need and Support	I need training on how to use artificial intelligence in developing teaching materials.	0.33	3.88
	I need practical guidance on how to apply artificial intelligence for material development.	0.33	3.88
	Support from the principal and colleagues is important for integrating artificial intelligence into material development.	0.43	3.76
	My school has adequate facilities to support the integration of artificial intelligence in developing teaching materials	0.51	3.41

b. Discussion with Stakeholders

After conducting needs analysis through the questionnaire, a discussion session with stakeholders was held via a Zoom meeting to plan the implementation of the program.

Picture 1

Discussion with Stakeholders



Several points were discussed during this stage, including:

- 1) Preparing the appropriate venue to support mentoring activities.
- 2) Scheduling a suitable time for the implementing this community service program
- 3) Designing activities in this community service program
- 4) Discussing platforms and materials to be discussed in the program

c. Implementation

This community service program began with welcoming remarks from both the school principal and the program coordinator. In their opening speeches, they emphasize the importance of integrating educational technology particularly artificial intelligence to assist teachers in developing more effective and innovative teaching materials. In his remarks, the principal highlighted the need for teachers to continuously improve their competencies, especially in digital literacy, as part of 21st-century education skills.

Picture 2
Opening Speech



During the mentoring session, the 17 participating teachers showed great enthusiasm. They actively engaged in discussions, explored various AI tools such as ChatGPT, Canva AI, Quizizz AI, and Magic School, and practiced designing digital learning materials tailored to their classroom needs.

Picture 3
Mentoring Session



However, there are several activities done in the implementation stage, as follows.

1) Introduction to Artificial Intelligence in Education

In the first activity, the lecturers guided the teachers to understand the concept of AI, best practices and ethical considerations of using artificial intelligence in education. To help teacher understand the

concept of Artificial intelligence, the lecturers begin the training by explaining definition, functions of and various examples of artificial intelligence tools used in instructional material development such as ChatGPT, Canva AI, Quizizz AI, and Magic School. The lecturers guided the teachers to use artificial intelligence to develop effective learning materials to be used in teaching activities such as image generator, story generator, worksheet generator, etc. In this session, the lecturers also forced the teachers to consider ethics in using artificial intelligence in education. They remind the teachers to usually evaluate AI-generated content to ensure its accuracy, appropriateness and cultural relevance. It becomes essential since artificial intelligence is the supportive tool, not to replace the teachers position in educational context.

2) Practical Session: Exploring AI Platforms for Developing Instructional Materials

In the practical sessions, the lecturers guided the teachers to integrate the use of artificial intelligence for developing learning materials. There are four platforms explained in this session including ChatGPT, Canva AI, Quizizz AI, and Magicschool.

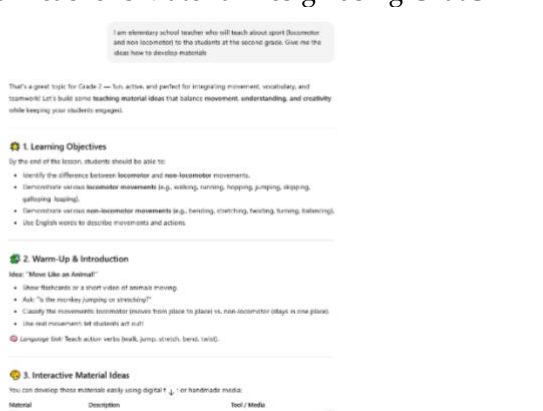
Picture 4
Practical Session



a) ChatGPT

ChatGPT becomes the most familiar platform facilitating the teachers to effortlessly gain ideas of teaching. By using ChatGPT, the teachers could interact and discuss how to develop learning materials effectively. In this community service program, the teachers are guided to effectively create specific prompt which are relevant to their goals of teaching. Here are one of the examples of material designed by the teacher using ChatGPT.

Picture 5
Example of Teacher’s Material Design using ChatGPT



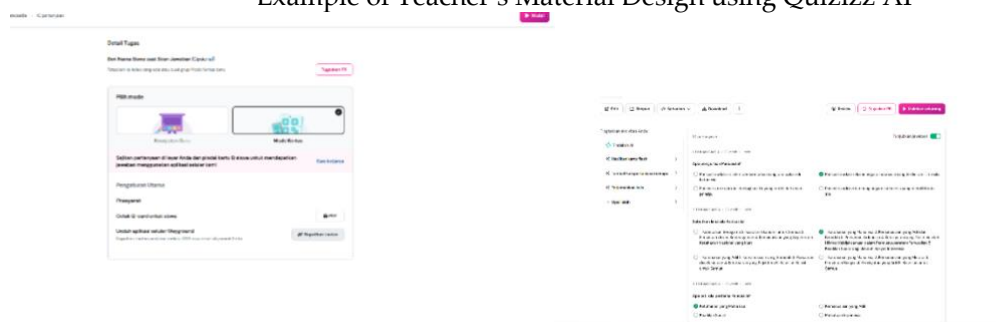
This example show that teacher could interactively discuss with ChatGPT about kinds of materials that can be used in the classroom. The teachers are also guided to critically evaluate and make feedback

toward the ideas given by ChatGPT. This activity becomes essential to provide effective learning resources which are relevant with the students' need.

b) Quizizz AI

To help teachers effectively create interactive quizzes, formative assessments, and gamified learning activities, the lectures introduced the use of Quizizz AI. Based on the preliminary data, it is found that all teachers previously know the way how to use Quizizz to support learning activities. However, some of them do not know how to integrate artificial intelligence features in Quizizz platform. However, the use of artificial intelligence features in this platform could help teachers to effortlessly create interactive quizzes to improve the quality of learning process. In this feature, the teachers could easily create quizzes by giving prompt, uploading files or link from internet. When guiding the teachers to use Quizizz AI, the lecturers facilitate them to integrate the topic they had in the classroom to create the quizzes. Some of them said that they have challenges to use this platform for teaching since the limitation of technology provided in the classroom. In this opportunity, the lecturers introduced paper mode feature that could be implemented in traditional classrooms setting.

Picture 5
Example of Teacher's Material Design using Quizizz AI

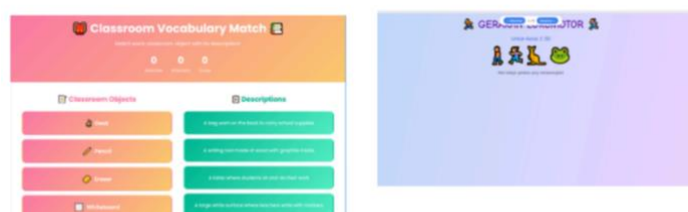


By using this feature, the teachers could effortlessly give the quiz to the students without the availability of smartphone or projector in the classroom. This will help them to make learning more engaging activities by giving game-like feature that can develop the students' motivation and participation.

c) Canva AI

Beside Quizizz AI, the lecturers guided the teachers to use Canva AI to develop sophisticated visual learning materials. This platform is a remarkable design platform with many features and capabilities. Canva AI could help teachers to create engaging learning resources that can motivate the students to learn. Whether for personal, professional, or educational use, Canva allows users to create appealing designs and eye-catching visuals with ease (Garcia et al., 2020). Since the teachers have *belajar.id* account given by the government, they can easily access many resources and premium templates on Canva for free.

Picture 6
Example of Teacher's Material Design using Canva AI

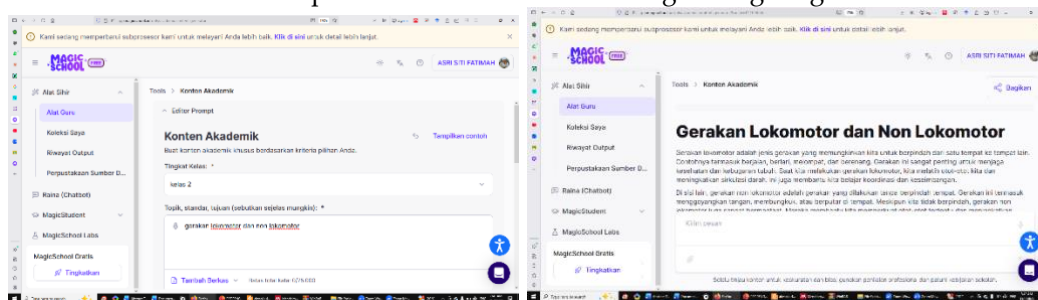


d) Magicschool AI

The last platform introduced by the lecturers in this community program is Magic School. There are many features provided in this platform which can help the teachers to develop learning materials such as image generator, text simplifier, story generator, etc. This platform also provides AI chatbot named Raina which can facilitate the teachers to actively discuss and gain teaching ideas. From all the artificial intelligence platforms discussed in this community service program, Magicschool become the most favourite platform since it provides many valuable features for the teachers.

Picture 7

Example of Teacher’s Material Design using Magicschool



3) Reflection and Sharing Session

In this step, the lecturers guided the teachers to make reflection after they were introduced and practiced using several artificial intelligence tools for material development. This session gives the opportunity for the teachers to share their challenges and practices when integrating artificial intelligence to develop learning materials. The teachers are also forced to share their opinion about the usefulness, accessibility, and potential of artificial intelligence tools to support their teaching practices.

Picture 8

Reflection and Sharing Session



4) Program Evaluation

After implementing the program, the lecturers then evaluate the effectiveness of the materials designed by the teacher. The teachers were asked to use the materials then evaluate them using reflection sheet and classroom observation. From the data gathered, the lecturers analysed how well the materials supported the learning objectives, engaged the students and facilitated the teaching learning activities.

Picture 9
Classroom Observation



Picture 10
Program Evaluation



This evaluation stage was crucial to identify the strength and weaknesses of the materials designed by using artificial intelligence. This constructive feedback becomes important for making better quality on the teachers' performance in the future teaching

4. CONCLUSION

This community service program named Assistance in Designing AI-based Teaching Materials to Enhance Digital Literacy of Elementary School Teachers. This program aims at enhancing the teachers' digital literacy especially on the use artificial intelligence for developing instructional materials. After program implementation, the teachers feel satisfied since they could create interactive and innovative teaching materials effortlessly. This material has the impacts on the development of students' learning engagement and positive classroom environment.

Acknowledgments: The authors would like to express their sincere gratitude to LPPM Universitas Siliwangi (UNSIL) for providing financial support for this community service project. This support has been instrumental in the successful implementation and completion of the program. The authors also appreciate all parties who have contributed, directly or indirectly, to this work.

Conflicts of Interest: The authors declare no conflict of interest of this community service program.

REFERENCES

- Fatimah, A. S., & Santiana, S. (2017). TEACHING IN 21ST CENTURY: STUDENTS-TEACHERS' PERCEPTIONS OF TECHNOLOGY USE IN THE CLASSROOM. *Script Journal: Journal of Linguistic and English Teaching*, 2(2), 125. <https://doi.org/10.24903/sj.v2i2.132>
- Febriyanti, E., & Haryanto, H. (2024). The Effectiveness Of Canva Application In Fun English Learning To Improve The Students' English Vocabulary (An Experimental Study For Grade XI Of SMK Balekambang Jepara). *Journal on Education*, 6(4), 19501–19513. <https://doi.org/10.31004/joe.v6i4.5870>
- Haeroni, R., Saptono, B., Kawuryan, S. P., & Sayekti, O. M. (2023). Digital Literacy and its Impact on

- Reading Interest in Prospective Elementary School Teachers. *International Journal of Elementary Education*, 7(3), 478–484. <https://doi.org/10.23887/ijee.v7i3.61819>
- Naveed, Q. N., Choudhary, H., Ahmad, N., Alqahtani, J., & Qahmash, A. I. (2023). Mobile Learning in Higher Education: A Systematic Literature Review. *Sustainability (Switzerland)*, 15(18). <https://doi.org/10.3390/su151813566>
- Nuryadin, R. (2023). Indonesian Journal of Primary Education The Use of AI (Artificial Intelligence) in Education (Literature Review). © 2023-*Indonesian Journal of Primary Education*, 7(2), 143–158. <http://ejournal.upi.edu/index.php/IJPE/>
- O'Bryan, A., & Hegelheimer, V. (2007). Integrating CALL into the classroom: The role of podcasting in an ESL listening strategies course. *ReCALL*, 19(2), 162–180. <https://doi.org/10.1017/S0958344007000523>
- Ummah, M. S. (2019). No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析 Title. *Sustainability (Switzerland)*, 11(1), 1–14. http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI