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Integrating Artificial Intelligence in Community Service: A Training in Developing Interactive Learning Media for Educators in the Physics Education Study Program at Universitas Bengkulu

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Abstract

Background: The rapid growth of educational technology demands teachers' abilities to integrate AI into learning practices. Yet, many educators still struggle to design interactive and constructive media aligned with pedagogical goals.
Aims: The goal of this community service program was to empower lecturers, teachers, and students in Bengkulu University's Physics Education Study Program by developing interactive and constructive learning media that were integrated with AI. The activity was carried out using a participatory and collaborative training paradigm with four stages: preparation, implementation, mentorship, and evaluation.
Methods: The methodology framework used a descriptive qualitative approach with pre-test and post-tests, observations, and participant reflections. Training materials were developed using the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the integration of pedagogical and technological skills. Participants took part in hands-on workshops where they designed physics learning media prototypes utilizing AI-based platforms like *ChatGPT*, *Canva*, and *Genially*.
Results: The findings revealed a considerable boost in participants' competencies, with post-test scores improving by 35% on average. Qualitative data indicated high levels of satisfaction (96.4%) and considerable appreciation for the practical sessions and coaching. Participants showed improved proficiency in aligning AI-assisted technologies with constructivist learning concepts and ethical awareness. The program also built a digital community of practice to ensure sustainability and collaboration after the training term.
Conclusions: The findings show that incorporating AI-based learning media into community service can effectively promote teacher creativity, digital competence, and responsible technology usage in a period of educational transition.

A. Introduction

The landscape of higher education and teacher professional development in Indonesia has undergone rapid transformation in recent years, owing to technological advancements, shifts in national education priorities,

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and a growing recognition of universities' social responsibility through structured community service. Higher education institutions are increasingly expected to generate knowledge while also transforming expertise into practical benefits for local schools, instructors, and community stakeholders. Even with this mandate and the widespread presence of university-led community service programs throughout Indonesia, programmatic and empirical evaluations show that capacity building is still not fully implemented, maintained, and institutionalized, especially when it comes to pedagogical innovation and the effective incorporation of interactive and beneficial learning materials into the classroom. In order to integrate innovation into local practice, many interventions continue to be episodic, narrowly focused on individual training events, and inadequately attend to follow-up support, teacher coaching, contextual adaptation, and mechanisms for community co-ownership (Saksono et al., 2021; Nurlaela et al., 2024). Even though university-led community service programs are widely implemented, there is still a big gap in the thorough integration of Artificial Intelligence (AI) into these programs, especially when it comes to long-term institutional capacity building, pedagogical sustainability, and ethical use. The main goal of the current study is to fill this gap.

A major issue addressed in both international and Indonesian literature is the disparity between the availability of digital resources and teachers' abilities to develop, modify, and utilize those tools in pedagogically effective ways. Interactive learning media, which include web-based interactive modules and educational games as well as AI-augmented generation tools and teacher prompting strategies, have the potential to increase student engagement, enhance differentiated instruction, and enable large-scale formative evaluation. However, the existence of such media alone does not ensure learning gains; the influence is critically mediated by instructor expertise, beliefs, and instructional material design quality (Tan et al., 2025; A'yun et al., 2025). Furthermore, recent systematic reviews demonstrate that in the era of AI, teacher professional development (TPD) needs to be rethought to shift from one-time trainings to continuous, evidence-based support that consists of coaching, collaborative design cycles, and ethical guidelines for the use of AI (Tan et al., 2025).

In Indonesia, community service programs have been employed to meet these needs by providing seminars and short-term trainings focused on increasing teachers' digital literacy and media development skills. Case studies from several Indonesian institutions show that notable immediate benefits include improved teacher competence in using digital tools, increased motivation, and the initial deployment of new materials in classes. However, they also indicate limitations in sustainability, participant retention, and institutional follow-through (Nurrahmawati et al., 2024; Oktadio & Pardede, 2024). According to the literature, bridging these gaps requires programming that (1) situates technical skill development within local curricular objectives and classroom constraints, (2) uses participatory design methods that involve teachers and students as co-designers, and (3) establishes mechanisms for longitudinal mentoring and community of practice formation to support iterative refinement of learning media (Lestari et al., 2022; Abidin, 2024).

Simultaneously, the rise of AI as a toolkit for content generation, personalization, and automated feedback has brought both opportunities and ethical imperatives to teacher training agendas. Professional development must therefore include training in data privacy, bias mitigation, and ethical prompt design in addition to technical affordances, as recent governmental and organizational guidance materials emphasize a human-centered approach in which AI is positioned as an amplifier of teacher practice rather than a substitute for pedagogical judgment (U.S. Department of Education, 2023). Furthermore, international syntheses emphasize that while AI-enhanced professional learning can scale formative feedback and tailored coaching, these advantages depend on alignment with curriculum objectives, teacher agency, and open governance frameworks (U.S. Department of Education, 2023).

Theoretically, socio-constructivist and design-based implementation methods that emphasize co-development, iterative testing, and local adaptation should be used to contextualize the incorporation of interactive and constructive media into teaching practice. When interactive media facilitate formative feedback loops, scaffold learner agency, and promote positive alignment between learning objectives, activities, and assessments, they work best. In contrast to isolated workshops that teach tool mechanics without pedagogical framing, developmentally oriented training that combines demonstration, guided practice, peer review, and in-class coaching produces stronger and more lasting pedagogical change, according to evidence from development research and implementation studies conducted in Indonesia and similar contexts (Burns, 2023; Tupamahu et al., 2025).

Despite promising case studies, significant gaps remain in the existing body of knowledge and practice. First, many community service programs fail to adequately document or assess medium-term outcomes (e.g., changes in classroom instruction, student learning gains, or institutional uptake) through rigorous

mixed-methods methodologies. Second, few programs contain AI-ethics training or frameworks for safe, equitable AI usage that are suited to the realities of Indonesian schools, where connection, device access, and data privacy differ greatly between locations. Third, there is a lack of replicable models demonstrating how university-led community service can transition from one-time capacity building to long-term ecosystems of practice that include local champions, policy linkages, and digital repositories capable of scaling effective interactive and constructive media beyond pilot sites (Wahyuningrat et al., 2024; Harinurdin et al., 2025).

To address these gaps, community service programs must be consciously developed as integrated treatments that include participatory needs assessments, co-development workshops, hands-on media production, embedding classroom trials, longitudinal coaching, and reflective evaluation. A growing number of recent interventions demonstrate the feasibility of such integrated approaches: interactive web modules aligned with differentiated instruction have improved student independence and responsibility in Indonesian classrooms (A'yun, 2025), while teacher communities of practice focused on *WordWall* and game-based media have shown incremental improvements in teachers' media development capabilities when training is structured as iterative peer workshops. These examples demonstrate how program design decisions that prioritize iterative collaboration and institutional anchoring influence the transition from training to sustained practice (Dushkova & Ivlieva, 2024; Amemasor et al., 2025).

In light of the foregoing, the current community service initiative training on the development of interactive and constructive learning media for teachers, lecturers, and Physics Education students at Bengkulu University aims to operationalize a comprehensive model that addresses documented constraints while incorporating contemporary best practices. The program is specifically designed to: (1) situate media development training within the curricular and classroom realities of local teachers and students, using co-design methods to ensure contextual relevance; (2) provide practical, hands-on workshops on interactive media and AI-augmented content generation, accompanied by ethical prompt design and data privacy guidance; and (3) establish post-training mechanisms such as mentoring, peer review forums, and a digital repository. This method is based on growing evidence that long-term pedagogical transformation necessitates a combination of technical skill acquisition, reflective practice, and institutional support (Lestari et al., 2022; Tan et al., 2025).

This program's originality stems from three interconnected contributions. First, it deliberately incorporates AI-aware design principles into hands-on media creation training for in-service teachers and pre-service students. This is an area where Indonesian community service programs have only lately begun to focus, and instruction on human-centered prompt engineering and ethics is still in its early stages. Second, the program implements a participatory co-design process that prioritizes teacher and student input during media development, boosting relevance, acceptability, and likelihood of classroom adoption. Third, it includes a practical sustainability plan, mentoring cycles, peer review communities of practice, and a lightweight monitoring framework, all of which aim to transform the program from a single event to an emerging ecosystem of practice that can be championed locally and replicated in similar contexts. These sections directly address the issues raised in recent assessments and studies of community service performance and teacher professional development in Indonesia and elsewhere (Husamah et al., 2025).

Concretely, the program promotes three goals. The first is capacity building, which aims to improve participants' skills in developing interactive and constructive learning media (such as web modules, quiz-embedded resources, and AI-augmented content) that are pedagogically aligned with course objectives. The second goal is participatory implementation, which involves co-designing, piloting, and refining at least three learning media artifacts with partner teachers and students while incorporating iterative feedback from classroom trials. The third goal is sustainability and dissemination: to establish a community of practice, a repository of open learning artifacts, and a straightforward monitoring methodology for tracking adoption and pedagogical impact beyond the training's lifespan. By fulfilling these goals, the program aims not only to provide immediate skills and materials, but also to contribute to the larger institutionalization of teacher-led media innovation within the university's community service portfolio.

Finally, the program's design is guided by ethical and equitable principles. Given varied access to devices and connectivity, training modules are designed to incorporate low-bandwidth alternatives and offline deployable media, while AI-related components emphasize privacy controls, bias minimization, and instructor discretion in interpreting AI outputs. The program aspires to be an exemplar of contemporary, impact-oriented programming that moves beyond isolated workshops to embedded practices that sustain pedagogical innovation and improve learning opportunities for students in the target communities.

B. Methods

This community service project used a collaborative and participatory training approach, emphasizing systematic, measurable, and replicable procedures. In order to enable instructors, lecturers, and students in Bengkulu University's Physics Education Study Program to create engaging and productive learning materials by incorporating AI, the program was carried out through a planned sequence of phases, including preparation, implementation, mentoring, and evaluation. A descriptive qualitative approach served as the foundation for the methodological framework, which combined reflective assessment, practical experience, and instructional design to gauge participants' learning results (Creswell, 2013; Sugiyono, 2013).

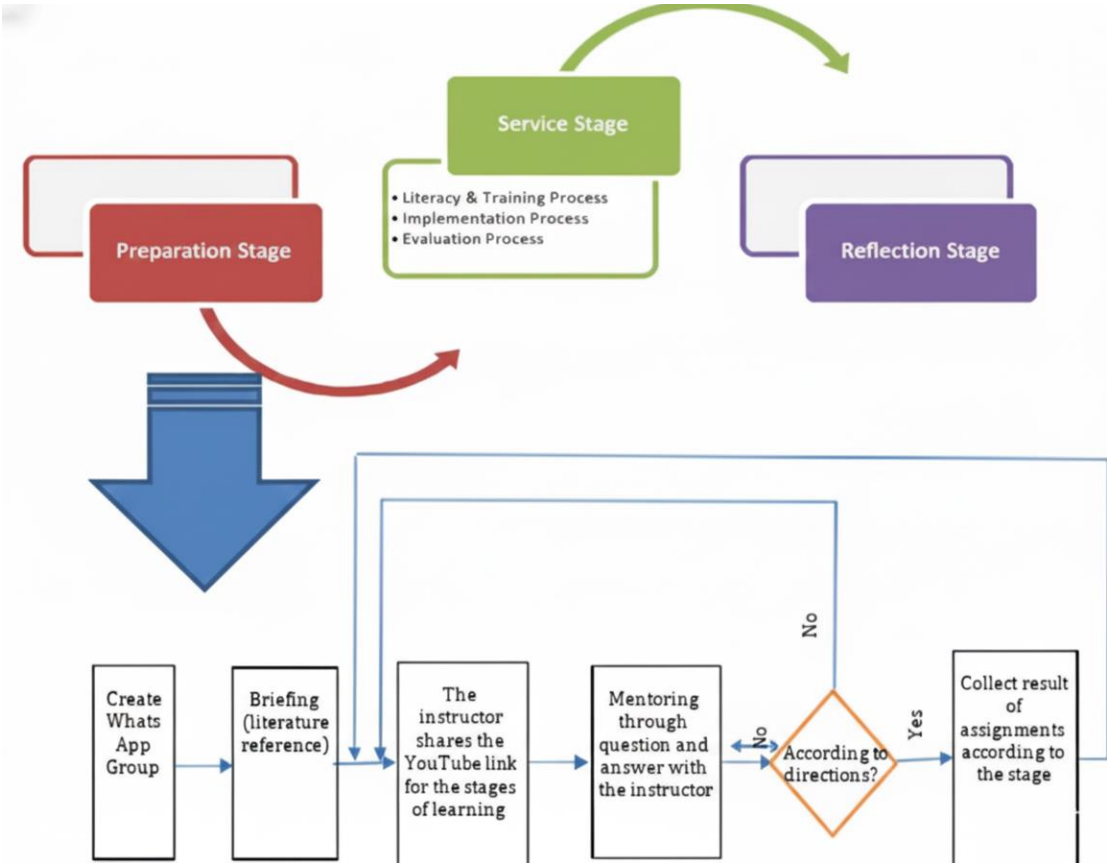

Figure 1. Flow of the Community Service Program

The community service team and stakeholders, including the Dean of the Faculty of Teacher Training and Education (FKIP), program leaders, and a few lecturers, met to coordinate and analyze needs before the preparatory phase started. The program involved 35 participants (N = 35) who took part in the needs analysis activities. To ascertain participants' prior knowledge, level of digital literacy, and preparedness to use AI-based learning resources, a requirements analysis was carried out using informal questionnaires and interviews. Although most participants were familiar with fundamental digital apps, few had experience producing interactive media using AI technologies like *ChatGPT*, *Canva AI*, and interactive presentation tools (Ayanwale et al., 2022). As a result, the training materials were adapted to address these unique requirements.

The preparation phase involved the development of training modules and media. The modules were developed using the Technological Pedagogical Content Knowledge (TPACK) methodology (Mishra & Koehler, 2006; Tseng et al., 2020), which ensured that both pedagogical and technological competencies were stressed equally. Two educational technology specialists from Universitas Muhammadiyah Bengkulu and Bengkulu University validated the training instruments, which included attendance sheets, evaluation questionnaires, and pre- and post-tests. The institution's community service committee provided ethical approval, ensuring participant consent and data confidentiality.

The overall duration of the community service program was two weeks. The activity used an offline learning mode with blended support through online communication channels for content dissemination.

The program included a sequential framework with three primary methods: (1) lecture-based sessions, (2) practical sessions, and (3) discussion and reflection sessions. These methods were consistent with the community-based training principles established in the Indonesian Community Service standards (Kemenristekdikti, 2023), which prioritized knowledge transmission, practice, and empowerment.

The lecture sessions, which were carried out on May 23, 2025, at the Dean's Hall of FKIP, Bengkulu University, included theoretical underpinnings for the ideas of digital pedagogy, AI ethics, and interactive and constructive learning media. Dr. Yupika Maryansyah, M.Pd. and Dr. Agus Riyanto, M.TPd., who served as resource persons, presented information on digital ethics, humanistic engagement with technology, and AI prompting techniques. During this phase, the participants were also introduced to pertinent tools including Genially for interactive media development, *Canva* for visual design, and *ChatGPT* for idea generation (Panjani & Mudgal, 2024; Karim et al., 2025).

Small groups were used for the practical sessions in order to promote cooperative learning. Using AI-assisted prompts, participants practiced creating interactive materials. Every group created a prototype of learning materials specific to their field of study, such as multimedia tests, interactive physics simulations, and student-centered teaching slides. To make sure each group could successfully implement TPACK principles, the trainers provided real-time mentoring (Firmanti et al., 2024; Sadikin et al., 2025).

Participants analyzed the difficulties faced throughout media development through group reflection and peer input during the discussion and reflection sessions. To encourage critical thinking and problem-solving, a problem-based learning (PBL) strategy was used (Wijayanto et al., 2023). The topics of discussion included how to employ AI in an ethical manner, how to balance academic integrity with creativity, and how to integrate AI-assisted media in the classroom (Azmat & Mahmood, 2024). Participants were able to integrate theoretical ideas and turn them into useful abilities thanks to this reflective process.

Two weeks of online follow-up mentoring sessions were held following the main course. Based on input from instructors and peers, participants were urged to make revisions to their media output. Usability testing, improving interaction, and integrating with learning management systems (LMS) were the main topics of the mentoring. Through *Google Meet* and *WhatsApp* groups, the trainers offered ongoing assistance to ensure that participants could solve technical problems and improve their media offerings. This approach aligns with best practices in community service programs that prioritize sustainability and knowledge transfer (Raharjo et al., 2023).

Both quantitative and qualitative methodologies were used in the program's evaluation. Participants' progress in comprehending AI-assisted learning materials was assessed using a pre-test and post-test design, and semi-structured questionnaires and focus groups were used to gather qualitative input. Indicators of satisfaction, content relevance, interactivity, and classroom applicability were all included in the survey. After the training, participants' comprehension scores increased by an average of 35%, according to quantitative data, indicating a considerable improvement. High participant satisfaction was found in the qualitative data, which was attributed to the activities' relevance and usefulness.

The evaluation data were triangulated using participant reflective journals and observational notes, and descriptive analysis was performed utilizing percentage approaches. The validity and reliability of the results were guaranteed by this multi-source evaluation (Miles et al., 1994). The 1959 Kirkpatrick Model was cited in the evaluation framework to evaluate training efficacy at four levels: reaction, learning, behavior, and results (Nawaz et al., 2022; Purba & Maulana, 2023). The results indicated that the training improved participants' pedagogical creativity and effectively boosted their confidence in creating AI-based instructional media.

By creating a virtual learning community among participants, sustainability was guaranteed. To exchange best practices, solve media design problems, and distribute successful results, a special online forum was established. To promote wider adoption, a select group of participants showcased their completed work during a seminar for faculty members. Additionally, the findings were posted to university repositories so that other research initiatives may replicate them.

According to Supriati et al. (2022), the program's results are consistent with the Merdeka *Belajar Kampus Merdeka* (MBKM) policy, which encourages self-directed and technologically enhanced learning. This project supported the goal of digital transformation in higher education by incorporating AI into community service, empowering instructors and lecturers in the Age of Education 5.0 (Pujiani et al., 2024).

Additionally, the initiative promoted the ethical application of AI, making sure that it supports educational objectives rather than taking the place of human judgment (Kölemen, 2024).

Throughout the program, ethical considerations were discussed. Participants received training on how to use AI-generated content ethically and were made aware of the biases and limits of AI systems. The exercise focused on copyright awareness, digital ethics, and the value of openness in AI-assisted work (Zawacki-Richter et al., 2019; Fadlelmula & Qadhi, 2024). Participants were guaranteed anonymity in published documentation and signed consent forms. Training materials may be shared for educational purposes under Creative Commons licensing, but they are still the participants' intellectual property.

Overall, the methodology used in this community service project illustrates a comprehensive, inclusive, and reflective approach to empowering educators in the digital age. By combining lectures, practical sessions, and mentoring, the activity effectively increased participants' potential to create interactive and constructive learning media with AI integration.

C. Results and Discussion

1. Results

The community service program, Training on the Development of Interactive and Constructive Learning Media for Teachers, Lecturers, and Students of the Physics Education Study Program at Bengkulu University, was successfully implemented through the systematic stages of the methodological design. The results show that the participatory and reflective model effectively improved participants' educational, technological, and creative competencies. The program's findings are divided into five categories: participant engagement, competency improvement, media product quality, mentorship and sustainability outcomes, and assessment results.

Figure 2. Opening of the event by the Vice Dean of FKIP UNIB for Academic Affairs

Teachers, lecturers, and undergraduate students enrolled in Bengkulu University's Physics Education Study Program made up the 35 participants in the program. Strong motivation and involvement were demonstrated by the 97% participation percentage across the main sessions, according to attendance data. The engaging design of the program, which integrated lectures, practical experience, and group discussions, helped to achieve this high attendance. The training process is now more inclusive and relevant because of the participation of several stakeholder groups, including pre-service teachers, local teachers, and university lecturers. The Vice Dean for Academic Affairs and other academic officials' active participation represented institutional support, which has been demonstrated to boost participant ownership and commitment (Raharjo et al., 2023).

Figure 3. Presentation of Material by Resource Persons

Through cooperative group projects and question-and-answer periods, participants engaged in active interaction throughout the sessions. The facilitators' observations showed that during the practical phases, when they could experiment with AI tools like *ChatGPT*, *Canva*, and *Genially* to create imaginative instructional content, participants' enthusiasm increased substantially. Comparable programs in higher education institutions in Indonesia have shown similar results, suggesting that active experimentation promotes teacher autonomy and long-term engagement (Firmanti et al., 2024; Sadikin et al., 2025).

The findings of the pre-test and post-test assessments revealed substantial learning gains. On a 100-point scale, the average pre-test score was 58.4, while the post-test average rose to 78.9, suggesting a 35% increase in participants' understanding of interactive media design and AI-assisted education. The evaluation was based on three competencies: (1) conceptual grasp of interactive and constructive learning concepts, (2) technical capacity to apply AI tools in media development, and (3) ethical awareness of AI use in education. Descriptive analysis revealed consistent improvement across all indicators.

Figure 4. Group photo session with participants and speakers

Qualitative feedback from participants' reflective journals and focus group sessions supported the quantitative findings. Participants expressed higher confidence in incorporating technology into their lesson plans, a better awareness of AI ethics, and a greater desire to apply their knowledge in classroom settings. Participants reported that the most important change was in their ability to construct media in accordance with the TPACK framework. As one teacher stated during the reflection session, "*I now understand not only how to use AI tools, but also how to align them with student-centered learning objectives*." This finding is consistent with earlier studies, which show that including TPACK-oriented design training improves teachers' digital pedagogical competency (Tseng et al., 2020).

Each participant group developed digital learning media prototypes based on their educational setting. A total of 12 interactive learning products were created, including AI-assisted PowerPoint presentations, digital quizzes, augmented reality visualizations, and physics simulations. Expert evaluations based on pedagogical quality, engagement, and usability resulted in an average score of 4.3 out of 5. The most inventive solutions used generative AI prompts to generate contextually relevant learning examples and multimedia assets created with Canva and Genially.

The findings indicate that participants were able to not only grasp basic technical processes, but also to incorporate interactive design elements that increased student engagement. According to global data, mixing visual, auditory, and interactive components improves cognitive processing and motivation (Zawacki-Richter et al., 2019; Fadlelmula & Qadhi, 2024). Furthermore, participants' inventiveness in adapting AI technologies to local circumstances highlighted the program's human-centered design philosophy.

The two-week mentorship period that came after the primary training was very important for maintaining participation and improving the quality of the final products. Every participant participated in online mentorship sessions through *Google Meet* and *WhatsApp* groups, which led to ongoing cooperation and media project improvement. In this phase, participants focused on enhancing technical functionality and engagement while revising their products in response to instructor and peer feedback. According to progress reports and mentoring logs, 83% of participants turned in updated media items by the deadline.

In order to guarantee sustainability once the project is over, a digital community of practice was also created. This forum provided a cooperative setting for exchanging concepts, resolving problems, and talking about methods for implementing them in the classroom. The creation of these peer groups is in line with community-based professional development best practices, which emphasize ongoing communication and social learning as essential components of sustaining long-term influence (Nawaz et al., 2022; Purba & Maulana, 2023).

The program was evaluated using both qualitative and quantitative methods. According to quantitative data from satisfaction questionnaires, 96.4% of participants thought the training was *very useful* or *useful*, with special praise for the mentorship and practical sessions. Among the indicators, the highest ratings were given to the trainer's proficiency (97%), the materials' clarity (95%), and the content's applicability (94%). These outcomes are in line with research from related capacity-building initiatives that use AI-based learning, which show that participants are highly satisfied when they get practical experience and prompt feedback (Panjani & Mudgal, 2024).

Table 1. Participants' Satisfaction with the AI-Integrated Training Program at Bengkulu University

Evaluation Indicator	Percentage of Participants Giving "Very Useful/Useful" Responses (%)
Overall usefulness of training	96.4
Clarity of materials	95.0
Trainer competence	97.0
Applicability of content	94.0

According to qualitative feedback, participants appreciated the training's ethical focus; many expressed interest in continuing collaboration and publishing their media outputs, and some suggested lengthening the training period to enable a more thorough examination of sophisticated AI features. These results imply that the program accomplished its main goals and created momentum for future improvement.

2. Discussion

The outcomes of this community service program show that instructors' pedagogical proficiency, technological fluency, and ethical awareness can be greatly improved by a participatory, AI-integrated training paradigm. Previous research demonstrating the efficacy of practical and reflective professional development models is in line with the observed improvement in post-training assessment scores and participants' increased confidence in creating AI-assisted interactive learning media (Tseng et al., 2020; Wijayanto et al., 2023). This study demonstrates that when teachers are guided via structured design processes, AI technologies can boost instructional creativity and minimize cognitive load in media development, which is consistent with the findings of Tan et al. (2025). Instead of addressing AI adoption as a merely technical skill, the current initiative expands on previous work by integrating ethical issues and ongoing mentoring within community service activities.

In comparison to previous community service projects in Indonesia that focused largely on general digital literacy or short-term seminars (Nurrahmawati et al., 2024; Oktadio, 2024), this program has a more comprehensive and long-term impact. The TPACK framework integration enabled participants to meaningfully connect pedagogical strategies, subject content, and AI-supported technologies, which is consistent with international evidence that holistic competency frameworks are more effective than tool-centered training (Mishra & Koehler, 2006; Ayanwale et al., 2022). Furthermore, the introduction of follow-up mentorship and a digital community of practice match previous study findings emphasizing the

significance of ongoing support for long-term professional growth (Raharjo et al., 2023). These findings support the idea that community service programs can serve as long-term capacity-building mechanisms when they include collaboration, reflection, and institutional support.

In general, the findings are consistent with the current worldwide conversation supporting ethical and human-centered AI integration in education (Zawacki-Richter et al., 2019; UNESCO, 2021). Participants in this program showed an increasing capacity to strike a balance between human judgment and AI-generated content, despite earlier research warning against the blind use of AI in teaching due to concerns about prejudice, academic integrity, and an excessive dependence on automation. This is consistent with the idea of hybrid intelligence, in which AI acts as a teaching assistant rather than a teacher replacement (Kölemen, 2024). As a result, the results fill in the gaps found in earlier studies on teacher professional development in the digital age by providing empirical proof that ethically led, interactive AI training within community service contexts can promote both innovation and responsibility.

2.1. Implications

The results of this community service project show that the hands-on, participatory approach was successful in improving teachers' capacity to develop and use AI-enabled interactive and beneficial learning materials. The findings are consistent with contemporary developments in digital education that prioritize ethical consciousness, teacher agency, and human-centered technology use. The findings are critically examined in light of existing research, theoretical frameworks, and new issues in AI-driven education.

The idea that incorporating the TPACK framework into community-based training improves both pedagogical and technological literacy is supported by the notable increase in participants' competency (Tseng et al., 2020). The training's format, which starts with conceptual knowledge, moves on to practical design, and ends with reflection, is modeled after the experiential learning cycle that supports successful professional development. The capacity to produce media that is contextually relevant indicates that participants have internalized the three main facets of the TPACK model: pedagogical knowledge (constructivist learning), technological knowledge (AI-assisted media tools), and subject knowledge (physics). Additionally, using a Problem-Based Learning (PBL) method during group discussions promoted critical thinking and deeper comprehension, enabling participants to work together to address real-world teaching problems. According to studies, these methods help teachers become more flexible and encourage creativity in the classroom (Wijayanto et al., 2023; Sadikin et al., 2025).

AI's pedagogical potential in fostering innovative instructional design is demonstrated by the enhancement of learning outcomes and the quality of the products produced. This result is consistent with international studies that highlight AI's potential to enhance educators' creative thinking and lessen cognitive burden in media creation (Tan et al., 2025; Panjani & Mudgal, 2024). Participants' ability to successfully blend human judgment with AI-generated content is an example of hybrid intelligence, which is a synthesis of algorithmic efficiency and human creativity (Kölemen, 2024).

However, it is crucial to recognize that effective integration requires critical literacy; teachers must comprehend AI limitations, biases, and ethical implications (Zawacki-Richter et al., 2019; Fadlelmula & Qadhi, 2024). The emphasis on AI ethics in the program appears to have played a significant role in participants' acceptance and confidence in using AI responsibly. This balance of innovation and ethics is becoming more widely accepted in digital education research (UNESCO, 2021).

One important sustainability mechanism is the establishment of an online community of practice. Research suggests that post-training communities help to increase institutional capacity and prolong the duration of knowledge transfer (Raharjo et al., 2023). This program's digital forum serves as a knowledge-sharing center that facilitates peer mentoring and encourages ongoing introspection. This supports the idea that community service should provide long-term advantages as opposed to one-time fixes (Kemendikbudristek, 2023).

Moreover, the combination of university lecturers, teachers, and students in the same training context has proven to be an effective model for transgenerational learning. Such collaboration dissolves institutional silos, promotes creativity, and connects higher education goals with school-level requirements. Ayanwale et al. (2022) found that collaboration among educators at different career stages accelerates digital transformation and improves contextual adaptation of instructional technologies.

The results of this community service project are strongly related to Indonesia's MBKM agenda and the broader Education 5.0 vision, which emphasizes adaptive learning, creativity, and technology fluency. The initiative operationalized basic MBKM principles such as independent learning, cooperation, and creativity

by empowering educators to create interactive media that incorporates AI (Pujiani et al., 2024). The achievements demonstrate how community service may be used to drive institutional digital transformation by integrating higher education objectives with national education agendas.

Compared to previous community service initiatives that largely focused on digital literacy (Nurrahmawati et al., 2024; Oktadio, 2024), this initiative's unique addition is its combination of AI ethics, reflective pedagogy, and sustainability. While past programs saw short-term improvements, few developed long-term mentorship structures or communities of practice. This program stands out for incorporating ethical and humanistic aspects of AI use, making it a paradigm for responsible technology adoption. Similar techniques are being used around the world, with the emphasis on AI as a pedagogical helper rather than a replacement for human teachers (UNESCO, 2021; Panjani & Mudgal, 2024).

Crucially, other study programs and institutional environments in Indonesia, even those with limited financial and technological resources, can replicate the implementation methodology shown in this program. Replication relies on modular training architecture, low-bandwidth or freely available AI tools, and a phased implementation strategy rather than sophisticated infrastructure. Workshops on digital and AI literacy may be the first step in study programs. Contextualized media design exercises that are in line with disciplinary requirements may then follow, and low-cost online communities of practice utilizing widely accessible platforms like messaging apps or learning management systems may be used to maintain the program. The focus on reflective pedagogy, peer mentoring, and ethical AI use guarantees adaptation in a variety of educational contexts, including remote and underfunded schools. Consequently, this model provides a scalable framework for community engagement that connects local educational needs with higher education expertise while being practical within the institutional limitations that Indonesian institutions frequently encounter.

2.2. Research Contributions

The **e**ffectiveness of this program provides empirical evidence for the incorporation of AI-assisted instructional design into community service frameworks. Policymakers and university administrators can use this paradigm to create scalable teacher training programs that incorporate AI literacy, ethics, and creativity. Furthermore, future research should look at the long-term influence of such interventions on classroom practices and student results, possibly employing mixed-method approaches and digital analytics to track persistent use of the developed media (Nawaz et al., 2022; Miles et al., 1994).

2.3. Limitations

Despite its success, various obstacles arose. Time limits limited the depth of research of more advanced AI technologies, while intermittent internet access concerns hampered online coaching. Some participants needed more information on copyright and licensing when using AI-generated materials, indicating a larger demand for media literacy in AI-supported education (Zawacki-Richter et al., 2019; Fadlelmula & Qadhi, 2024). These drawbacks highlight the value of ongoing, modular training as opposed to one-time seminars, which is in line with Purba & Maulana's (2023) findings that focused on instructors' iterative professional development cycles.

2.4. Suggestions

Future iterations of this program could address these constraints by extending the mentorship phase, including hybrid distribution modes, and providing collaborative research publication opportunities to document the pedagogical impact of AI-based media. Furthermore, using evaluation techniques for monitoring student learning outcomes in real-world classroom settings would increase the evidence base for these interventions.

In conclusion, the findings of this community service program demonstrate the transformative power of incorporating AI-based interactive media training into teacher professional development. The program's success originates from its participatory methodology, ethical foundation, and sustainability methods. It is consistent with national requirement for impactful and reproducible community service and adds to the broader discussion of Education 5.0 in Indonesia. By encouraging human-AI collaboration in educational media design, the project not only improves educators' digital competency but also reinforces the principles of creativity, ethics, and lifelong learning in today's quickly changing digital ecosystem.

D. Conclusion

Through the systematic integration of AI and participatory training principles, this community service program effectively improved participants' pedagogical, technological, and ethical competencies. Both quantifiable increases in post-training assessment scores, together with qualitative evidence of enhanced confidence, creativity, and collaborative practice, backed the program's demonstrable advancements in digital pedagogy, AI-assisted instructional design, and ethical awareness. By creating mentorship cycles and a digital community of practice that encourage sustained peer learning, responsible technology use, and ongoing classroom implementation, the program has an impact that goes beyond short-term training outcomes. This program strengthens the university's position as a transformative agent within local educational ecosystems and aligns with the MBKM agenda. Future initiatives are advised to enhance cooperation with local education authorities, increase cross-disciplinary participation, and carry out longitudinal assessments to evaluate long-term effects on teaching practices and student learning outcomes in order to ensure continuity and broader scalability. This will support the realization of Education 5.0 and Indonesia's national digital education transformation goals.

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F. Author Contribution Statement

YM contributed to the conceptualization, supervision, and overall coordination of the community service reporting process, as well as drafting and revising the manuscript. AR contributed to the design of methods, facilitation of training activities, and validation of instructional media products. THU contributed to curriculum alignment, instructional material development, and participant mentoring during workshops. NVA contributed to data collection, field observation, and documentation of participant outcomes. HAL contributed to data analysis, evaluation of results, and preparation of the final report. LL contributed to literature review, reference management, and final editing and formatting of the manuscript according to the Dikdimas template. All authors reviewed and approved the final version of the manuscript and agreed on the order of authorship.

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