



Participatory Action Training-Based Deep Learning Training for Primary School Teachers in Sleman Regency

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Abstract

Background: The implementation of the Merdeka Curriculum requires primary school teachers to adopt deep learning approaches that emphasize higher-order thinking, reflection, and student-centered learning. However, many teachers still experience limited understanding and practical readiness, resulting in a gap between curriculum policy and classroom practice.

Aims: This community service activity aimed to enhance teachers' conceptual understanding and pedagogical skills in applying deep learning through a Participatory Action Training framework that integrates theory, simulation, classroom practice, and reflection.

Methods: The program involved 25 primary school teachers from SDN Deggung and SDN 1 Dukuh in Sleman Regency. Activities were conducted through three stages: preparation, training implementation, and follow-up evaluation. Training sessions included interactive lectures, case studies, microteaching simulations, classroom implementation, and reflective discussions. Evaluation was carried out using participant response questionnaires and implementation reflections analyzed descriptively.

Result: The findings indicate strong positive responses from participants, with all teachers acknowledging the relevance of the material to the Merdeka Curriculum. Most participants demonstrated improved capacity to design contextual teaching modules, integrate higher-order thinking skills, and apply authentic assessment strategies. Reflection sessions also revealed shifts toward student-centered and inquiry-based learning practices.

Conclusion: Participatory Action Training effectively strengthened teachers' readiness to implement deep learning. The approach provides a sustainable and replicable professional development model for enhancing primary education quality under the Merdeka Curriculum framework.

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INTRODUCTION

Education in the era of independent learning using the Merdeka curriculum requires teachers to not only convey material, but also to act as facilitators who are able to foster critical, creative, collaborative, and communicative thinking skills in students. The Merdeka curriculum was developed in 2020 and has been gradually implemented since 2021. However, schools still face many challenges in implementing the Merdeka curriculum (Maskur, 2023). Primary school teachers still face difficulties in implementing the independent curriculum. These difficulties include a lack of understanding of the concept of independent curriculum, difficulties in developing teaching modules, implementing learning assessments, and limitations in the use of technology (Purwulan, 2024; Mayangsari et al., 2024; Ardianti & Amalia, 2022).

To improve the quality of education in the Merdeka Curriculum, one relevant approach that has been implemented is deep learning. Deep learning is a learning approach designed to adapt to the diverse needs, abilities, interests, and learning styles of students (Ain & Hariani, 2023). Deep learning

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is not a new curriculum, but rather an approach applied to the Merdeka curriculum (Setiani et al., 2025).

Several studies have discussed deep learning in primary schools and recommended training and mentoring for teachers in applying deep learning (Hasanah & Pujiati, 2025; Mahardika & Jaya, 2025; Widayawati et al., 2025). The suboptimal implementation of deep learning indicates a gap between the Merdeka curriculum policy and actual teaching practices in the field.

This gap arose because most teachers did not fully understand the independent curriculum, compounded by the implementation of deep learning, which meant that teachers were not ready to implement it. Interviews with the principal of Deggung State Elementary School in Sleman Regency revealed that teachers had only attended one training session on deep learning, and their level of understanding was only around 25%. Therefore, systematic efforts are needed in the form of deep learning training oriented towards improving teachers' pedagogical and professional competencies.

This training aims to improve teachers' understanding and skills regarding deep learning, not only as a means of increasing theoretical knowledge, but also as a forum for direct practice in designing, implementing, and evaluating deep learning-based learning. Effective teacher training must encourage collaborative, reflective, and context-based learning in schools. Therefore, the training at SDN Deggung was designed with a participatory approach, involving discussions, learning simulations, and mentoring in the implementation of deep learning designs in the classroom.

Although various training programmes related to the Merdeka Curriculum have been implemented, the implementation of deep learning in primary schools still faces obstacles, particularly in terms of learning design and assessment based on higher-order thinking skills. Initial findings at SDN Deggung show that teachers have only attended one deep learning training session and their level of understanding is still limited. This situation indicates a gap between policy requirements and teacher readiness in the field. Therefore, a training programme is needed that is not only socialisation-based but also provides space for practice, reflection, and continuous mentoring through a participatory approach.

Through this training, it is hoped that teachers will be able to understand the basic concepts of deep learning, develop teaching modules oriented towards higher-order thinking processes, and apply appropriate and fair learning assessments. In addition, the long-term results of this activity are expected to improve teachers' professional competence and create an adaptive and innovative learning ecosystem in primary schools. Thus, this training plays an important role in bridging the gap in teachers' understanding of deep learning while strengthening the implementation of the Merdeka curriculum at the primary school level.

METHOD

This in-depth learning training activity utilises the Participatory Action Training (PAT) approach, which is a participatory training model that combines theoretical and practical learning to improve teachers' professional competencies. This approach was chosen because it provides space for participants to interact, discuss, and reflect on the learning experiences gained during the activity. The training was conducted offline on 27 October and 4 November at Deggung State Primary School, Sleman Regency. Then, online on 29 November 2025, the training involved 25 teachers from SDN Deggung and SDN 1 Dukuh.

The implementation of activities was carried out in three main stages, namely (1) the preparation stage, (2) the training implementation stage, and (3) the follow-up stage (reflection and evaluation). During the preparation stage, a needs analysis was conducted to determine the extent to which teachers understood and applied deep learning. This analysis was carried out through interviews with school principals. The results of the needs analysis then formed the basis for the development of training materials, which included the concept of deep learning, the design of project-based learning activities, and authentic assessment strategies.

The training implementation stage was carried out through a combination of interactive lectures, group discussions, case studies, and learning simulations. The first meeting focused on understanding the basic concepts of deep learning and its relation to the independent learning policy, the development of deep learning-based teaching modules, and case studies of deep learning implementation in primary schools.

The second meeting began with a presentation and discussion of the teaching modules developed during the first meeting, followed by a learning simulation, in which participants practised the designs they had created and received direct feedback from resource persons and fellow teachers. Teachers were then given the opportunity to implement the deep learning approach in actual teaching situations. The results were presented at the third meeting.

The third meeting, which was held online, consisted of a follow-up stage in the form of post-training reflection and evaluation, where teachers were asked to apply the training outcomes in their respective classrooms for two weeks and then report on the results of their implementation. The activity was evaluated using participant response questionnaires and learning implementation reflections. The questionnaires were used to measure teachers' perceptions of the relevance of the material, training methods, and the benefits of the activity in supporting pedagogical competence. The data was analysed descriptively to illustrate the achievements of the community service activity.

RESULTS AND DISCUSSION

Results

The training for the first meeting on 27 October 2025 was held at SDN Denggung from 09:00 to 15:00 (Figure 1). The material for the first session, from 09:30 to 12:00, covered growth mindset, graduate profile dimensions, learning principles, learning experiences, and learning frameworks. The first session was conducted using discussion and case study methods. Teachers were asked to share their experiences and the challenges they faced in the learning process.



Figure 1. Training at the first meeting

In the second session, which ran from 13:00 to 15:00, the material discussed was planning and assessment of in-depth learning. The resource persons presented examples of teaching module designs and assessments for in-depth learning. This was followed by a discussion of teachers' experiences. The topic of planning and assessment of learning was then continued in the second meeting, where teachers were asked to prepare teaching modules to be practised in simulations.



Figure 2. Training at the second meeting

The second meeting (Figure 2) was held on 4 November 2025 at Denggung State Primary School from 09:00 to 15:00. The activity began with a review of the material from the first meeting, followed by microteaching practice. Teachers were asked to practise deep learning for about 20 minutes, after which other teachers participating in the meeting provided feedback, responses, input, or comments on the practice. Teachers were then given the opportunity to apply deep learning in their respective classrooms, the results of which were presented at the third meeting. The third meeting (Figure 3) was held online on 29 November 2025. Teachers had applied deep learning to the subjects they had chosen in their respective classrooms. They then shared the process, results, and obstacles they had encountered for discussion with other participants. The activity lasted for 2 hours from 13:00 to 15:00.

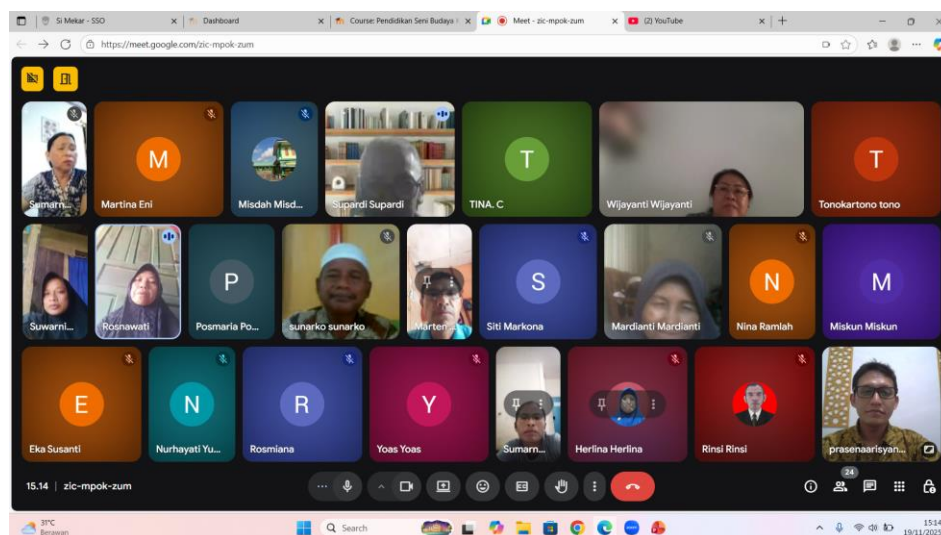


Figure 3. Training at the third meeting

The in-depth learning training conducted at Denggung State Elementary School in Sleman Regency received positive responses from all participants. Based on the results of the training participant response questionnaire, 100% of participants stated that the training material was very relevant to the needs and requirements of the Merdeka curriculum. In addition, the training

implementation was also rated 100% or very good. In terms of methodology, an average of 83% of participants rated it as very good and said it improved their understanding of the difference between surface learning and deep learning, as well as how to apply it in the classroom. The training also provided excellent benefits for teachers in developing their competencies and making the learning process more innovative. The results of the activity showed that the majority of participating teachers responded positively to the deep learning training. Based on the response questionnaire, most participants rated the training material as appropriate for the implementation of the Merdeka Curriculum and helpful in clarifying the differences between surface learning and deep learning. In addition, teachers showed an increase in their ability to design teaching modules that are more contextual and oriented towards the thinking process of students.

Discussions

The results of observations during the simulation sessions showed that most teachers were able to design learning activities that emphasised problem solving, reflection, and inter-conceptual connections, in line with the characteristics of deep learning. In terms of pedagogical skills, teachers showed improvement in designing teaching modules that were more contextual and oriented towards higher-order thinking processes. Before the training, most teachers tended to use conventional learning models with teacher-centred activities. After the training, participants' learning designs showed the integration of critical thinking elements, collaborative activities, and authentic assessments that measure students' deep understanding. This is in line with previous research findings which state that practice-based training can improve teachers' ability to design meaningful learning (Nurhidayati et al., 2025; Oktarianto et al., 2025; Yustitia et al., 2025).

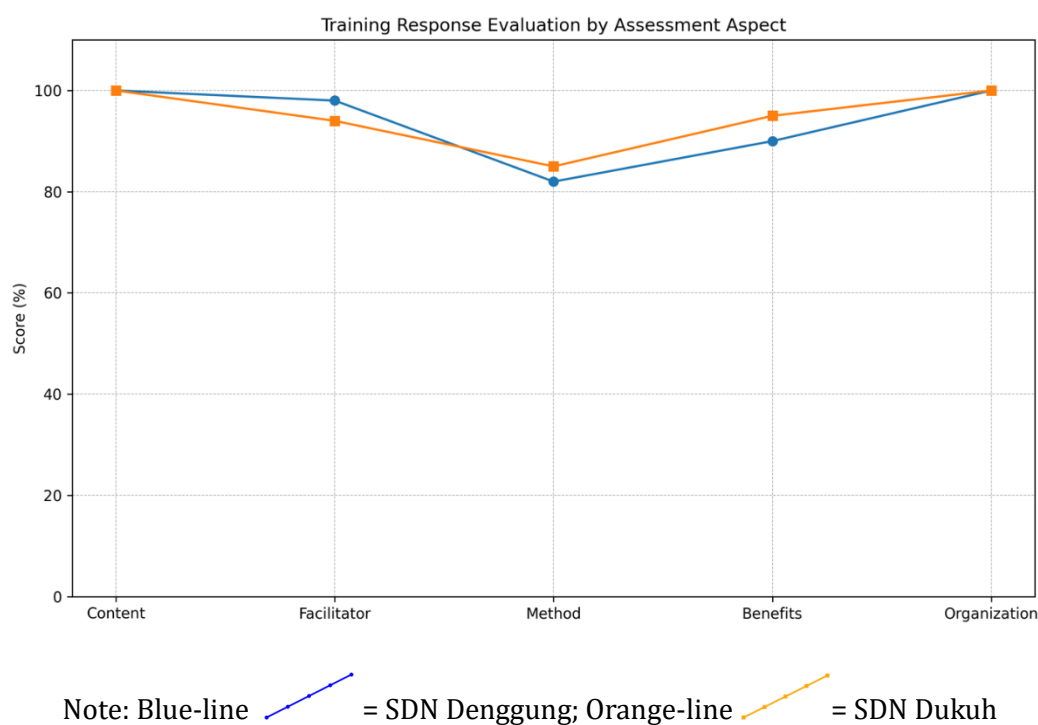


Figure 4. Training response survey results

In addition to improving technical competence (Figure 4), this training also had an impact on changing teachers' attitudes and mindsets towards the learning process. Through reflection sessions and group discussions, teachers began to understand that deep learning does not only focus on the end result, but also on the thinking process and active involvement of students in constructing their own knowledge. Some teachers even reported that they had tried to apply a project-based learning approach that emphasised student exploration and creativity in their classrooms. This change reflects significant professional growth, as changes in teachers' beliefs and behaviour are key indicators of successful professional development. Overall, this deep learning training successfully

bridged the gap in teachers' understanding of the principles of Merdeka Belajar. Teachers not only gained new knowledge but were also able to apply it in their classroom teaching practices. The positive impact of this activity highlights the importance of continuous training that is participatory, contextual, and reflective in improving the competence of primary school teachers.

The findings of this study indicate that training based on a participatory approach can improve teachers' readiness to implement deep learning. Teachers' active involvement in discussions, simulations, and reflections encourages changes in their understanding and attitudes towards learning. This is in line with previous research findings that emphasise the importance of training based on real-world practice in developing teacher competencies. One of the problems in implementing the curriculum and in-depth learning approach is the lack of socialisation, training, and workshops attended by teachers (Dewi & Astuti, 2022; Lestari et al., 2023; Hendrianty et al., 2024; Yusyfia et al., 2025). Therefore, similar activities are recommended to be carried out regularly with the support of school policies and education agencies, so that the implementation of deep learning can become an integral part of the learning culture in primary schools.

Implications

The findings of this community service initiative have important pedagogical and institutional implications for the implementation of deep learning within the Merdeka Curriculum framework. The improvement in teachers' capacity to design contextual modules, integrate higher-order thinking skills, and apply authentic assessment strategies indicates that participatory action training can effectively bridge the gap between curriculum policy and classroom practice. This suggests that teacher readiness is not solely dependent on policy dissemination, but on structured professional development that emphasizes reflection, collaboration, and real-world application. Furthermore, the positive shift in teachers' mindset, from teacher-centered instruction toward student-centered, inquiry-based learning, demonstrates that sustainable educational reform requires transformation at both cognitive and attitudinal levels. The participatory structure of the training allowed teachers to experience deep learning as learners themselves, strengthening their confidence and professional agency. Therefore, such training models may serve as catalysts for fostering adaptive, innovative, and reflective learning cultures in primary schools.

Contribution of Community Service

This community service program contributes meaningfully to educational innovation by operationalizing deep learning principles through a structured Participatory Action Training model. Unlike conventional one-directional workshops, this initiative combined theory, simulation, classroom implementation, and reflective evaluation, thereby ensuring that professional development extended beyond conceptual understanding into practical transformation. The program also reinforces the role of higher education institutions as partners in strengthening teacher professionalism at the grassroots level. By collaborating directly with primary school teachers and addressing real classroom challenges, the initiative created a supportive ecosystem for pedagogical improvement. The integration of reflection sessions, peer feedback, and mentoring mechanisms provides a replicable framework for other schools seeking to enhance curriculum implementation through participatory professional development.

Limitations

Despite its positive outcomes, this activity presents several limitations. The training was conducted within a limited timeframe and involved teachers from only two primary schools, which may restrict broader generalization of results. The evaluation relied primarily on descriptive questionnaire data and reflective reports, without longitudinal measurement of student learning outcomes or sustained classroom transformation. Additionally, variations in teachers' initial competencies and technological familiarity may have influenced the depth of implementation across participants. The relatively short post-training observation period limits conclusions regarding long-term consistency in applying deep learning strategies. Therefore, the findings should be interpreted within the contextual boundaries of community-based professional development rather than as comprehensive systemic reform evidence.

Suggestions

Future initiatives are recommended to incorporate longitudinal mentoring and structured follow-up evaluation to assess sustained pedagogical transformation. Establishing professional learning communities among participating teachers may help maintain collaborative reflection and peer support beyond the training period. It is also advisable to integrate deep learning training into district-level teacher development programs, ensuring alignment with education office policies and school leadership support. Expanding the program to include classroom-based student performance indicators would provide a more holistic understanding of impact. By combining continuous mentoring, institutional backing, and systematic evaluation, participatory action-based deep learning training can evolve into a sustainable model for strengthening primary education quality under the Merdeka Curriculum.

CONCLUSION

Participatory Action Training-based deep learning training has been proven to improve primary school teachers' conceptual understanding and pedagogical skills in designing and implementing learning that focuses on students' thinking processes. The participatory approach provides effective space for reflection and practice in bridging the gap between the demands of the Merdeka Curriculum and classroom learning practices. However, the limited duration of the mentoring programme poses a challenge in maintaining consistency in implementation. Therefore, it is recommended that similar activities be carried out on an ongoing basis with the support of school policies and the formation of teacher learning communities.

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AUTHOR CONTRIBUTION STATEMENT

PA conceptualized and designed the community service program, developed the Participatory Action Training framework, supervised the overall implementation, and led the manuscript preparation. MA contributed to the development of training materials, facilitated workshop sessions, and supported data collection and analysis. QM assisted in program coordination, mentoring activities, documentation, and participant evaluation processes. MSW contributed to methodological refinement, critical revision of the manuscript, and validation of pedagogical interpretation. All authors reviewed, approved, and agreed to be accountable for the final version of the manuscript.

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