Reflektif Strengthening Elementary School Teacher Competence through Training and Mentoring for the Implementation of In-Depth Learning and Assessment in Kulon Progo

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Abstrak
Kegiatan Pengabdian kepada Masyarakat ini dilatarbelakangi oleh belum optimalnya implementasi pembelajaran mendalam (*deep learning*) dan pemanfaatan asesmen diagnostik serta formatif di Sekolah Dasar (SD), khususnya di wilayah Kabupaten Kulon Progo. Kegiatan ini bertujuan meningkatkan kompetensi profesional guru dalam merancang dan mengimplementasikan pembelajaran yang berpusat pada peserta didik, bermakna, kontekstual, serta didukung asesmen berkelanjutan. Metode pelaksanaan menggunakan pendekatan partisipatif dan kolaboratif melalui sosialisasi, pelatihan, praktik penyusunan perangkat pembelajaran dan instrumen asesmen, implementasi di kelas, pendampingan, refleksi, dan *coaching* melalui komunitas belajar guru. Hasil kegiatan menunjukkan peningkatan pemahaman dan keterampilan guru dalam merancang pembelajaran mendalam, mengintegrasikan aktivitas berpikir tingkat tinggi, memanfaatkan teknologi secara adaptif, serta menggunakan asesmen diagnostik dan formatif untuk memperbaiki proses pembelajaran. Kegiatan juga mendorong terbentuknya kolaborasi antarguru dalam pengembangan perangkat pembelajaran dan refleksi praktik pembelajaran. Program ini berkontribusi pada penguatan kompetensi profesional guru dan peningkatan kualitas pembelajaran di sekolah mitra serta mendukung pencapaian SDG 4 tentang Pendidikan Berkualitas. Keberlanjutan program dilakukan melalui komunitas belajar, pendampingan berkala, dan pengembangan perangkat pembelajaran yang dapat digunakan secara berkelanjutan.

Kata kunci: Pembelajaran mendalam; Asesmen diagnostik; Asesmen formatif; Kompetensi guru; Sekolah dasar.

Abstract
This Community Service activity was motivated by the suboptimal implementation of deep learning and the underutilization of diagnostic and formative assessments in elementary schools, particularly in the rural and peripheral areas of Kulon Progo Regency. The initiative aims to enhance teachers' professional competence in designing and implementing instruction that is student-centered, meaningful, and contextual, while being supported by continuous assessment. The implementation employs a participatory and collaborative approach involving awareness-raising, training, hands-on development of instructional materials and assessment instruments, classroom implementation, mentoring, reflection, and coaching through teacher learning communities. Results indicate improved teacher understanding and skills in designing deep learning experiences, integrating higher-order thinking activities, adaptively utilizing technology, and employing diagnostic and formative assessments to refine the instructional process. The activity also fostered collaboration among teachers regarding the development of instructional materials and the reflection of teaching practices. This program contributes to strengthening teachers' professional competence and improving the quality of instruction in partner schools, thereby supporting the achievement of SDG 4 (Quality Education). Program sustainability is ensured through learning communities, periodic mentoring, and the development of instructional materials designed for long-term use.

Keywords**:** *deep learning; diagnostic assessment; formative assessment; teacher competence; primary school.*

INTRODUCTION

Improving the quality of basic education is a crucial part of efforts to establish an education system that is inclusive, equitable, and focused on enhancing the quality of learning. In this endeavor, teachers play a strategic role as key actors in the learning process. Teacher competence specifically in designing meaningful learning experiences, selecting and applying appropriate pedagogical strategies, integrating technology into instruction, and conducting accurate assessments is a vital factor that determines the quality of students' learning processes and outcomes. Therefore, strengthening teacher capacity and professionalism is fundamental to fostering learning that adapts to student needs and remains relevant to the demands of educational development in the digital era. UNESCO emphasizes that teachers who are well-trained, professionally supported, and provided with opportunities for continuous professional development are essential to achieving Sustainable Development Goal 4 (SDG-4) regarding quality education (UNESCO, 2024).

Thus, increasing teacher competency is not sufficient to be done through temporary training, but needs to be directed at a professional development process that is sustainable, collaborative, contextual, and based on real needs in schools. Teacher professional development is essentially a career-long learning process that enables teachers to continue to update their knowledge, pedagogical skills, professional competence, and ability to respond to changes in student characteristics and educational dynamics. The OECD emphasizes that teacher professional development needs to be seen as a lifelong process because the demands on the teaching profession continue to grow, including in the application of innovative pedagogy, use of technology, student-centred learning, and meeting increasingly diverse learning needs (Ellaso et al., 2026).

The effectiveness of professional development is also largely determined by the characteristics of the program being implemented. Desimone (2009) posits that effective professional development possesses at least five key characteristics: a focus on content, active learning, alignment and coherence with teachers' needs, sufficient duration, and collective participation (Ventista & Brown, 2023). These five characteristics show that teacher competency development cannot be understood as a one-way knowledge transfer activity through short seminars or workshops, but as a professional learning process that allows teachers to understand concepts, practice them, obtain feedback, reflect, and adapt them to the learning context in the classroom. Apart from that, professional teachers are one of the fundamental factors in determining the quality of educational processes and outcomes. Teacher professionalism is not only related to mastery of learning material, but also includes pedagogical abilities, professional skills, commitment to students, ability to reflect, and willingness to continue developing competencies. Thus, professional teachers are seen as individuals who are able to carry out educational tasks competently, responsibly and oriented towards improving the quality of learning (Thurlings & Brok, 2017).

Shifting student characteristics and the demands of 21st-century learning underscore the need to transform instructional practices in primary schools. Learning can no longer focus merely on content mastery and final outcomes; instead, it must provide students with opportunities to build meaningful understanding, think critically, solve problems, collaborate, reflect on the learning process, and connect knowledge to real-life situations. In line with this, the OECD (2024) emphasizes that modern education must equip students with the ability to think critically, be creative, collaborate, integrate diverse knowledge, and take collective action. These changes indicate that the learning process needs to shift from a mere transfer of knowledge toward learning experiences that enable students to construct knowledge, develop higher-order thinking skills, and apply that knowledge to address authentic challenges (Ukwigize & Ndayambaje, 2026). This perspective is reinforced by studies on deep learning, which position conceptual understanding, active engagement, critical thinking, collaboration, and the connection between knowledge and real-life contexts as essential components of the learning process (Kawuryan et al., 2025). The demands of 21st-century education extend beyond academic achievement to encompass the development of critical thinking, creativity, communication, and collaboration skills through meaningful and sustained learning experiences. Consequently, primary school instruction needs to be designed as a process that enables students not only to know a concept but also to grasp its meaning, apply their knowledge, connect it to everyday experiences, and reflect on their learning

processes and outcomes (Isnayanti, 2025). The deep learning approach is relevant in this context because it frames the learning process as a meaningful experience, actively engages learners, and fosters a deeper understanding. In practice, deep learning requires a shift in the teacher's role from a mere provider of information to a facilitator who designs learning experiences and offers support tailored to the learners' needs.

This need is particularly relevant when viewed against the reality of primary education in Kulon Progo Regency. The distribution of schools across urban, rural, and remote areas where access to educational resources is limited creates a diverse range of learning conditions and challenges. Teachers are expected not only to master the subject matter but also to select instructional models suited to their students' characteristics, implement student-centered learning, utilize digital technology pedagogically, and conduct diagnostic and formative assessments to identify student learning needs. In practice, however, these expectations are not yet fully matched by the readiness and capacity of all teachers. Some teachers still struggle to translate the concept of deep learning into concrete classroom practice. Instruction often remains conventional and focused on content delivery, while the use of assessment as an integral part of the learning process remains suboptimal. Meanwhile, technological advancements and the emergence of artificial intelligence (AI) tools present both opportunities and new challenges for teachers in designing learning experiences that are relevant, meaningful, and aligned with student needs.

These circumstances indicate that improving the quality of primary education in Kulon Progo cannot be achieved solely through the provision of instructional materials or curriculum policies; it must be accompanied by the continuous strengthening of teacher capacity. Teachers are the key actors who translate educational policies into daily classroom practice. Therefore, teacher professional development should focus on enhancing practical and contextual skills, ensuring that knowledge gained through training can be immediately applied to address instructional challenges faced in schools. Given this context, training for primary school teachers in Kulon Progo Regency is both important and strategic. Such training aims not only to provide a conceptual understanding of deep learning, assessment, and the use of digital technology but also to offer teachers practical experience in designing, implementing, and evaluating instruction. Through training activities grounded in the actual needs of schools, teachers are expected to develop instructional approaches that are more active, contextual, reflective, collaborative, and focused on the development of student competencies.

Thus, teacher training serves as a crucial strategy for bridging the gap between the demands of educational transformation and the actual realities of classroom instruction in primary schools. Continuous strengthening of teacher competencies is expected to drive change at the classroom level spanning lesson planning, instructional delivery, and technology integration to the assessment of both learning processes and outcomes. Ultimately, enhancing teacher capacity is expected to foster primary school education in Kulon Progo Regency that is higher in quality, inclusive, and adaptive, while effectively meeting the needs of students in an era of increasingly complex change.

METHOD

The research employed a descriptive approach with systematically structured stages designed to identify needs, enhance teacher competence, implement deep learning and meaningful assessment, and evaluate changes in instructional practices. The research process comprised five main stages. The first stage involved dissemination and a needs analysis; dissemination activities targeted school principals and partner teachers to establish a shared understanding of the research objectives, procedures, scope, and mechanisms. Subsequently, a needs analysis was conducted to assess the initial state of instruction, teacher competence, readiness to implement deep learning, assessment practices, and the availability of supporting facilities and infrastructure. The baseline data obtained during this stage served as the foundation for determining the intervention focus, designing activities, and establishing forms of support tailored to the specific characteristics and needs of the partner schools.

The second stage of teacher competency training and development focuses on enhancing teachers' knowledge and skills in designing and implementing in-depth learning and meaningful assessments. The training is conducted interactively through material presentations, discussions, case studies, simulations, and hands-on practice. Teachers are guided to develop instructional

materials specifically teaching modules and assessment instruments tailored to the characteristics of their students and the specific learning contexts of their respective schools. The instructional products generated during this stage serve as a data source for evaluating the development of teachers' capabilities following the intervention.

The third stage involves the implementation and utilization of technology, specifically by applying the outcomes of the training to actual classroom instruction. Teachers receive support in integrating principles of deep learning and meaningful assessment, alongside the use of technology that is simple, adaptive, and contextual. Technology is employed to facilitate content delivery, instructional interaction, student activities, and the administration of assessments. This stage entails observing the execution of lessons, student engagement, the teacher's ability to implement instructional strategies, and the effectiveness of technology in supporting the learning process.

The fourth stage comprising mentoring, observation, and evaluation is a continuous process carried out throughout the implementation of instruction. Data collection involves observation, interviews, documentation, and teacher reflection to gather information on the process and outcomes of the program's implementation. Observations focus on the execution of in-depth learning, the integration of assessment into the instructional process, the use of technology, changes in teaching practices, and student engagement. The collected data is analyzed descriptively to identify changes, challenges, and supporting factors during the implementation process. The evaluation results subsequently serve as a basis for providing feedback and refining instructional practices.

The fifth stage focuses on reflection and program sustainability, involving a collaborative review process between the research team and partner teachers. This reflection aims to identify successes, challenges, and necessary improvement strategies regarding the implementation of deep learning and meaningful assessment. The insights gained are then used to formulate best practices and recommendations for classroom implementation. Program sustainability is reinforced through the establishment of teacher learning communities, the sharing of best practices, the development of implementation guidelines, and the integration of program outcomes into continuous professional development activities. Consequently, the improvements in teacher competence and changes in instructional practices are expected to be enduring rather than temporary, fostering ongoing development to enhance educational quality and support the achievement of Sustainable Development Goal 4 (SDG 4).

RESULTS AND DISCUSSION

The community service initiative was conducted at two elementary schools in Kulon Progo Regency: SD Negeri 2 Sentolo and SD Negeri Degung. A total of 28 students participated 22 fifth-grade students from SD Negeri 2 Sentolo and six second-grade students from SD Negeri Degung. The activities were carried out according to the stages outlined in the Community Service proposal. These stages included training and mentoring on the implementation of deep learning, strengthening diagnostic and formative assessments, and providing continuous professional support through teacher communities. The training and mentoring sessions were conducted via both in-person and online formats, involving elementary school teachers from 16 partner schools in Kulon Progo Regency.

The community service initiative was carried out through a series of four main activities comprising both in-person and online training sessions involving 16 partner elementary schools in Kulon Progo Regency followed by direct mentoring at two specific partner schools: the 5th-grade class at SD Negeri 2 Sentolo and the 2nd-grade class at SD Negeri Degung. This phased approach aimed to ensure that teachers not only gained a conceptual understanding but also had the opportunity to apply the concepts practically under the guidance of the service team. The use of different grade levels specifically a 5th-grade class of 22 students and a 2nd-grade class of 6 students provided insight into the varied contexts of implementation, allowing for the adaptation of teaching strategies to suit the students' differing cognitive characteristics.

Details regarding the results of each stage are presented further in the following section.

Training

SD Negeri 2 Sentolo

The lesson took place on Tuesday, July 21, 2026, running from 08:30 to 10:10 WIB. The instructional process comprised several stages: opening, material presentation, group-based learning, presentations, and evaluation. The topic for this Grade 5 class was Natural and Social Sciences (IPAS), specifically the chapter "Harmony in Ecosystems," covering "Interactions Between Ecosystem Components" and "The Role of Humans in Ecosystems." The lesson was conducted in accordance with the teacher's lesson module, utilizing the Project-Based Learning (PjBL) model and a deep learning approach. Methods employed included visual observation, case analysis, group discussions, the creation of ecosystem dioramas, presentations, STEAM application, and a summative assessment at the end of the lesson. Five observers educators from SD Negeri Kepek, SD Negeri Kepundong, and SD Negeri Ngargosari monitored the classroom proceedings to provide an evaluation following the lesson conducted by the student teacher. Overall, the lesson proceeded smoothly, in a structured and conducive manner, and aligned with the prepared lesson module. Students were actively engaged throughout the lesson, paying attention to the teacher's explanations, asking questions, and answering the questions posed to them. The lesson was structured into three main stages: the introductory phase, the core activity, and the closing activity. The following is a description of the implementation stages for the "Harmony in Ecosystems" lesson in the Grade 5 class at SD Negeri 2 Sentolo. During the introductory phase, the teacher greeted the students and led an opening prayer. This was followed by checking on the students' well-being and conducting an ice-breaking activity. The teacher then outlined the learning objectives and the activities the students would undertake and be assessed on during the lesson.





Figure 1. Stages of Community Service Implementatio **Figure 2. Core Learning Activities**

In the core activities, specifically Stage 1 (student orientation to the problem), the teacher displays puzzle pieces depicting animals (biotic elements) and a river (an ecosystem), and students guess what the images represent. Groups that answer correctly receive praise from the teacher. Next, the teacher shows a video clip regarding ecosystem degradation and asks students to identify the causes by connecting them to the lesson material. In Stage 2, the teacher organizes the students for learning by having them watch a video about food chains. Students are asked questions regarding food chains and energy transfer pathways. Afterward, the teacher divides the students into groups and distributes learning materials and worksheets to each group. In Stage 3, the teacher guides group investigations using the "Ecosystem Mystery Package," instructing students to create an ecosystem puppet diorama based on the provided guidelines. Working in groups, students correctly sequence the food chain for their assigned ecosystem and describe the energy transfer pathway. They then discuss and answer the questions found on the worksheet. In Stage 4, the teacher facilitates the presentation of student work, with group representatives showcasing their "Ecosystem Mystery Package" products and worksheet analysis results to the class. Then, in Stage 5, the teacher evaluates the work and provides feedback to the presenting groups. Once the presentations conclude, the teacher reviews the worksheet with the class to compare their answers against the questions asked.





Figure 3. Lesson Closing Activities

In the closing activity, the teacher facilitated a reflection session and summarized the material the students had learned. Subsequently, students worked independently on a multiple-choice evaluation. The lesson concluded with the teacher commending and rewarding all groups for their active participation. Finally, the teacher ended the session with a group prayer and a formal closing greeting. Overall, the implementation of these instructional steps in the Grade 5 class at SD Negeri 2 Sentolo demonstrated the teacher's ability to translate "deep learning" principles into actual classroom practice. Integrating STEAM specifically through the creation of an "Ecosystem Wayang Diorama" product showcased the teacher's innovative approach. By incorporating elements of joyful, mindful, and meaningful learning, the lesson fostered greater student enthusiasm and improved comprehension of the subject matter; it also encouraged cooperation and a sense of responsibility through group discussions during the learning process. Although the lesson generally followed the three planned core stages, some implementation challenges arose. First, time constraints meant that some groups could not fully complete their Wayang Dioramas or ensure the lighting mechanisms functioned; this also resulted in a rushed assessment phase at the end of the lesson. Second, the large class size prevented the teacher from providing comprehensive individual feedback within a single session. Third, the formulation of HOTS-based (Higher-Order Thinking Skills) questions still required further guidance to ensure consistent application.

SD Negeri Degung

One of the community service initiatives was carried out through a lesson conducted in a second-grade class at SD N Degung, focusing on the subject of Pancasila Education. The activity involved two instructors and six observers comprising one observer teacher each from SD N 2 Depek and SD N 2 Depok, and two observer teachers each from SD N 1 Wonorejo and SD N 1 Kalipetir. The topics taught were the Principles of Pancasila and their application in daily life. The lesson took place on Tuesday, July 21, 2026, from 08:00 to 09:10 WIB. Overall, the lesson proceeded smoothly in accordance with the teaching module's design, incorporating methods such as question-and-answer sessions, group discussions, lectures, and assignments. Additionally, the

Project-Based Learning (PjBL) model was implemented, notably through the teacher posing fundamental questions to the students. The following is a description of the activities conducted at SD N Degung under the topic "The Principles of Pancasila and Their Application." The lesson comprised three main stages: the preliminary activity, the core activity, and the closing activity. In the preliminary activity, the teacher began the lesson by offering greetings, welcoming the students, and leading a collective prayer. Next, the teacher asked all students to sing the "Sila Pancasila" song together. This was followed by an apperception phase, where the learning material was linked to real-life situations. Finally, the teacher outlined the learning objectives and introduced the main topic of study: the principles of Pancasila.



Figure 4. Material on Pancasila

Core Activities, Stage 1. The teacher presents the material by displaying an image of the Garuda Pancasila on the screen. The teacher then explains the wording of each Pancasila principle and relates them to everyday life. Occasionally, the teacher asks questions, inviting students to provide examples of behaviors that reflect the values of the Pancasila principles. Additionally, the teacher sometimes incorporates "ice-breaking" activities by asking students to stand up and perform movements to relieve boredom.



Figure 5. Digital learning

Stage 2. Technology integration: Students are asked to match the wording of the Pancasila principles with their corresponding symbols using an interactive media display in the classroom. Students take turns coming to the front to answer directly; the interactive media provides immediate feedback, indicating whether their choices are correct or incorrect. Stage 3. Group Work and Student Worksheets the teacher divides students into groups to complete the tasks outlined in the worksheets. Each group works collaboratively to match the Pancasila symbols with the wording of the principles. Group members are tasked with cutting out and pasting the images to match the correct pairings. Stage 4. Group Presentations: After completing the worksheets, each group is asked to present their work. Groups take turns coming to the front to share their results by reading the wording of the Pancasila principles while pointing to the corresponding symbols. Stage 5. Assessment: Before the closing activity, the teacher assesses the students by having them complete a set of multiple-choice questions. Closing Activity: The teacher guides the students in summarizing the lesson material together to reinforce their understanding. Next, the teacher invites students to reflect on the learning activities and provides feedback. Before concluding the lesson, the teacher reinforces key concepts and outlines the activities or topics to be covered in the next session.

Strengthening Diagnostic and Formative Assessments

Activities to strengthen diagnostic and formative assessments were conducted as an integral part of the training and mentoring program on implementing deep learning for elementary school teachers in Kulon Progo Regency. These activities aimed to enhance teachers' understanding of the role of assessment within the learning process, ensuring that assessments serve not merely to measure learning outcomes but also as a basis for designing and refining instruction to meet students' needs. This aligns with the program's objective of emphasizing the importance of utilizing assessment results to inform instructional decision-making.

The activity began with a presentation on the concepts of diagnostic and formative assessment, covering their objectives, characteristics, timing, and role in supporting deep learning. Subsequently, teachers received guidance in developing assessment instruments tailored to learning objectives, the nature of the subject matter, and student characteristics. The developed instruments are expected to provide information regarding both students' initial capabilities and their learning progress throughout the instructional process.

After developing the instruments, teachers receive guidance on implementing diagnostic and formative assessments within learning activities. Diagnostic assessments are used at the initial stage of learning to gain insight into students' readiness and learning needs, while formative assessments are conducted during the learning process to monitor progress. The assessment results are then analyzed collaboratively to serve as a basis for reflection and to determine appropriate follow-up actions tailored to the students' circumstances. This guidance provides teachers with hands-on experience in integrating assessment into the learning process, ensuring that assessment serves not merely as a means of evaluation, but as a foundation for refining classroom teaching strategies.

The implementation of this activity also supports the program's output targets: enhancing teachers' ability to develop diagnostic and formative assessment instruments and to utilize assessment results in lesson planning. Consequently, strengthening diagnostic and formative assessment is expected to serve as a means to improve the quality of instruction, making it more adaptive to students' learning needs and aligned with the implementation of deep learning.

Continuous Professional Support Based on Teacher Communities

Ongoing professional support is being implemented as a follow-up to training on deep learning implementation and diagnostic and formative assessments. This initiative is designed to provide teachers with a space to reflect on their experiences implementing instructional materials in the classroom and to engage in ongoing discussions; it also offers them the opportunity to provide feedback on their teaching practices, serving as a basis for improvement in future lessons. The mentoring process was carried out through joint discussions and reflection sessions involving the community service team and the primary partners. During these activities, teachers shared their experiences regarding the implementation of instruction, discussed the suitability of the prepared instructional materials, and identified various challenges encountered during classroom execution. The outcomes of these discussions served as a basis for collective reflection to formulate alternative improvements for future lessons.

This support is also aimed at fostering a culture of collaboration among teachers through teacher learning communities. These communities serve as a platform for teachers to share experiences, exchange best practices, and provide mutual feedback on developing deep learning and utilizing classroom assessments. Through such forums, teachers are expected to gain continuous professional support to enhance their pedagogical capabilities in alignment with the specific learning needs of their respective schools.

The implementation of continuous professional support aligns with the program's objectives, which emphasize the importance of post-training sustainability through the establishment of teacher communities, reflective activities, and the strengthening of teachers' roles as agents of change within their schools. Consequently, the training outcomes extend beyond merely enhancing conceptual understanding; they are further reinforced through ongoing reflection and collaboration, enabling the continued development of deep learning practices and meaningful assessment within school-based instruction.

Reflection Activity



Figure 6. Reflection on practical activities



Figure 7. Discussion session on follow-up actions.

Reflection is a crucial stage in the implementation of Community Service activities, as it offers teachers the opportunity to review their teaching experiences, identify successes and challenges, and formulate improvements for future lessons. This reflection takes place after teachers have received content reinforcement and practiced instruction focused on deep learning, as well as the use of diagnostic and formative assessments. During the reflection phase, teachers are encouraged to analyze their classroom teaching practices specifically regarding active student engagement, the provision of meaningful learning experiences, the application of strategies that foster critical thinking, and the integration of assessment into the learning process. Teachers reflect on whether their instruction has provided sufficient opportunities for students to ask questions, explore, engage in discussions, solve problems, connect the material to real-life situations, and reflect on their own learning processes.

The reflection process was conducted through group discussions and the sharing of experiences among teachers. Each teacher was given the opportunity to share their instructional practices, including strategies that had been successfully implemented and challenges they continued to face. The discussion results indicated that while teachers already employed various positive practices, there were still aspects requiring strengthening such as managing learner-centered instruction, formulating inquiry-based questions that foster higher-order thinking skills, integrating diagnostic and formative assessments, and providing more constructive and continuous feedback.

Reflection also aims to help teachers understand that deep learning is not merely a matter of using specific methods or media, but rather a shift in perspective regarding the design and implementation of instruction. Teachers need to ensure that students not only acquire knowledge but also grasp concepts more deeply, connect that knowledge to real-life contexts, apply it in

diverse situations, and reflect on their own learning processes and outcomes. Thus, reflection serves as a means for teachers to identify the gap between their current instructional practices and the practices to which they aspire.

Based on the reflection results, the teacher and the community service implementation team formulated several follow-up actions to enhance the quality of instruction. These actions include improving lesson planning, strengthening the use of diagnostic assessments to identify students' initial needs, utilizing formative assessments to monitor learning progress, and developing learning activities that are more contextual, collaborative, and student-centered. Teachers are also encouraged to cultivate a habit of continuous reflection after conducting lessons.

Thus, reflection serves not only as an evaluation of instructional implementation but also as an integral part of the teacher's professional development process. Through systematic reflection, teachers can identify the strengths and weaknesses of their teaching practices, determine strategies for improvement, and build a commitment to implementing instruction that is more meaningful for students. This stage is expected to support the sustainability of the Community Service (PkM) program by fostering changes in teaching practices that are implemented gradually, contextually, and continuously within their respective schools.

CONCLUSION

Community service activities conducted through training and mentoring on the implementation of deep learning and meaningful assessment have contributed to strengthening the professional and pedagogical competencies of elementary school teachers in Kulon Progo Regency. The program, which involved 16 partner schools, demonstrated that teacher competency development requires a systematic, phased approach: ranging from training, practice, and classroom implementation to mentoring, reflection, and the reinforcement of sustainability through teacher learning communities.

The implementation of instruction at SD Negeri 2 Sentolo and SD Negeri Degung demonstrates that the principles of deep learning can be applied contextually, aligning with the characteristics of the subjects, grade levels, and student needs. In the Grade V Natural and Social Sciences (IPAS) class at SD Negeri 2 Sentolo, the use of Project-Based Learning (PjBL), STEAM, collaborative activities, case analysis, and the creation of "Ecosystem Wayang Diorama" products fostered a learning environment that was active, meaningful, and enjoyable, while also encouraging student cooperation and responsibility. Meanwhile, in the Grade II Pancasila Education class at SD Negeri Degung, the use of interactive media, group discussions, student worksheets (LKPD), presentations, and reflection provided a learning experience that actively engaged the students.

The program also strengthens teachers' understanding and skills in utilizing diagnostic and formative assessments as an integral part of the learning process. Assessments are not merely tools for measuring learning outcomes; rather, they are used to gather information on students' readiness and needs, monitor learning progress, and serve as a basis for determining appropriate follow-up actions. Furthermore, professional support facilitated through reflection and teacher learning communities provides a space for teachers to share experiences, identify challenges, and collaboratively develop their instructional practices.

Nevertheless, the program's implementation still faces several challenges, including time constraints during project-based learning activities, difficulties in providing optimal individual feedback when class sizes are large, and the need to strengthen teachers' skills in formulating questions based on Higher Order Thinking Skills (HOTS). Therefore, continuous training and mentoring are essential to ensure that changes in instructional practices do not end with the training sessions themselves but evolve into a sustainable professional culture within the school. Overall, the program demonstrates that strengthening teacher capacity through training, hands-on practice, mentoring, reflection, and learning communities is a relevant strategy for supporting the implementation of deep learning and meaningful assessment, as well as for enhancing the quality of primary education in Kulon Progo Regency.

RECOMMENDATIONS

Based on the outcomes of the community service activities, follow-up actions are required to ensure sustained support so that teachers' competence in implementing deep learning and diagnostic-formative assessment moves beyond mere conceptual understanding to become consistent classroom practice. This entails optimizing learning communities as platforms for collaboration, sharing best practices, developing instructional materials and assessment instruments, and reflecting on teaching implementation; enhancing teachers' skills in designing and utilizing diagnostic and formative assessments, as well as creating HOTS-based instruments that foster critical thinking, problem-solving, analytical skills, creativity, and the application of knowledge in real-life contexts; strengthening time allocation planning for project-based learning to ensure that all stages from planning, project execution, and presentation to assessment, feedback, and reflection are carried out optimally; utilizing technology adaptively aligned with the school's existing facilities and infrastructure to support interaction, student engagement, assessment, and meaningful learning experiences; and expanding and replicating the program in other elementary schools across Kulon Progo Regency, while considering the specific characteristics, needs, and readiness of each school, accompanied by a more systematic and sustained impact evaluation to assess changes in teacher competence and the program's contribution to student engagement, higher-order thinking skills, and learning outcomes.

ACKNOWLEDGEMENTS

The author extends gratitude to the Institute for Research and Community Service at Yogyakarta State University for its support in carrying out this activity. Thanks are also conveyed to the partner agency the Kulonprogo Regency Government as well as the elementary schools and teachers across Kulonprogo Regency who participated, and to all parties who provided support, cooperation, and active participation throughout the program's implementation. Appreciation is also expressed to the supporting institutions for providing the opportunities and facilities that enabled the successful execution of this activity. It is hoped that this initiative will prove beneficial in enhancing teachers' professional and pedagogical competencies and contribute to improving the quality of education at the elementary school level.

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