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ENHANCING TEACHERS' ABILITY TO DEVELOP HOTS-BASED ASSESSMENT INSTRUMENTS IN THE MERDEKA CURRICULUM AT ELEMENTARY SCHOOLS

Sri Dewi Nirmala *, Sendi Ramdhani, Amalia Sapriati, Kristanti Ambar Puspitasari, Maman Rumanta, Riandi Marisa, Siti Julaeha, Yuli Artanti, Hartiningsih, Puji Lestari
Universitas Terbuka
Jl. Pd. Cabe Raya, Pd. Cabe Udik, Kec. Ciputat, Kota Tangerang Selatan, Banten 15437, Indonesia
Email: nirmaladewi@ecampus.ut.ac.id

Abstract

Assessment is a critical subsystem in the overall learning process. However, teachers still face challenges in developing assessments, particularly those that align with Higher Order Thinking Skills (HOTS). The results of a needs analysis indicated that teachers at the partner schools require urgent training and guidance in creating both formative and summative assessment instruments. The Community Service Program (PkM) was conducted at SD Negeri Marga Mulya VI, Bekasi City. The PkM activities were based on the Asset-Based Community Development (ABCD) approach and consisted of six stages. The outcomes of this PkM activity include: (1) the successful implementation of training and assistance in the development of assessment instruments, enabling teachers to understand and create assessment tools; (2) the creation of assessment instruments by teachers, which can now be utilized in the learning process; and (3) positive responses from teachers, who reported that the PkM activities significantly benefited them in preparing and applying assessments in teaching. The outcomes of this PkM initiative can be further followed up through discussions and dissemination within the school's Learning Community to deepen understanding.

Keywords: Assessment, Elementary School, Higher Order Thinking Skills (HOTS), Independent Curriculum

INTRODUCTION

Education serves as the primary foundation for the development of a nation. To advance its education system, Indonesia continues to innovate by introducing the *Merdeka Curriculum* as a progressive initiative. This curriculum signifies a paradigm shift aimed at enhancing the quality and relevance of education in elementary schools. The education system exerts a significant influence on the development of 21st-century skills among students. This impact is rooted in teachers' competencies in pedagogy, curriculum design, regulations, school climate, assessment, and benchmarks for skill acquisition, all of which are crucial factors in fostering learning that supports the development of 21st-century skills (Zufar, Thaariq, and Karima, 2023).

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Teachers are the frontliners in both pedagogy and curriculum development, playing a pivotal role in creating meaningful learning experiences. From the perspective of competencies, teachers are expected to possess a comprehensive set of skills, including pedagogical competence, personal competence, social competence, and professional competence. One pedagogical competency closely tied to professional competence is the ability to conduct assessments and evaluate the learning process and outcomes. According to Ministerial Regulation No. 16 of 2007 on Academic Qualification Standards and Teacher Competencies, the indicators for competency in assessment and evaluation include the ability to: (1) understand the principles of assessing and evaluating learning processes and outcomes in line with the characteristics of the subjects taught; (2) determine key aspects of learning processes and outcomes to be assessed and evaluated based on the characteristics of the subjects taught; (3) establish procedures for assessing and evaluating learning processes and outcomes; (4) develop instruments for assessing and evaluating learning processes and outcomes; (5) administer assessments of learning processes and outcomes continuously using various instruments; (6) analyze assessment results for various purposes; and (7) conduct evaluations of learning processes and outcomes.

Assessment is a critical subsystem in an educational system. The success of any learning activity can be measured through the outcomes assessed. Assessment serves to evaluate both the learning process and outcomes, helping students understand themselves, identify learning difficulties, and discover potential achievements that can be developed. It also functions as a diagnostic tool (Wahyuningsih, 2023). The purpose of implementing learning assessments is to collect and process information to identify learning needs, track developmental progress, and evaluate students' learning outcomes (Mujiburrahman, Kartiani, & Parhanuddin, 2023).

In the *Merdeka Curriculum*, assessment emphasizes a holistic understanding of students' progress and achievements. Evaluation within the *Merdeka Curriculum* at the elementary school level is directed toward formative and summative assessments to design learning activities tailored to students' achievements (Aprima & Sari, 2022). Aligning with this, Ministerial Regulation No. 21 of 2022 concerning Education Assessment Standards for Early Childhood Education, Basic Education, and Secondary Education stipulates that assessment is the process of collecting and processing information to identify learning needs and track developmental progress or learning outcomes. This is done to facilitate decision-making based on specific criteria and considerations (Nur Budiono & Hatip, 2023).

Assessment is a vital component of the learning process, serving as an indispensable tool to determine learning progress, inform follow-up actions, and provide interventions that support students in achieving learning goals (Wardani, 2023). The current focus of learning assessment has shifted from summative assessments, which primarily evaluate performance outcomes, to formative assessments, which identify learning gaps and provide insights into students' ongoing development (Martin, Mraz, & Polly, 2022).

Presently, assessment processes are often deprioritized and treated as mere formalities, despite their critical importance in education (Rosana et al., 2020). Research indicates that teachers' development of assessment instruments often falls short of expected standards (Suhandi & Robi'ah, 2022). Additionally, many assessment tools are still dominated by multiple-choice formats, which primarily measure students' knowledge and understanding, focusing on lower-order thinking skills (Ali, 2021). Other studies reveal that only 31% of

teachers have conducted assessments encompassing all three domains cognitive, affective, and psychomotor and only 15% of teachers possess adequate understanding to develop attitude-scale assessment instruments (Astuti, Slameto, & Dwikurnaningsih, 2017). These findings highlight the need for improved assessment practices to effectively support student learning and development.

The lack of teachers' understanding and skills in developing assessment tools significantly impacts learning outcomes from the perspective of learning evaluation. With the advancement and implementation of the *Merdeka Curriculum*, the orientation of assessment has shifted. Formerly used for summative purposes to fill student progress reports, assessment now emphasizes formative purposes, serving as a foundation for improving subsequent learning processes (Nur Budiono & Hatip, 2023). Based on its functions, assessment can be categorized into three types: assessment as learning (AaL), assessment for learning (AfL), and assessment of learning (AoL). AaL places students at the center of the assessment process. It involves self-reflection, peer assessment, and learning journals, helping students set learning goals and understand how to achieve them. AfL is a formative approach aimed at providing continuous feedback during the learning process. It helps teachers and students identify strengths and weaknesses, enabling instruction to be tailored to students' needs. AoL is a summative approach used to evaluate students' final achievements after a learning period ends. This type of assessment determines final grades or student graduation and provides feedback on the effectiveness of teaching (Schellekens et al., 2021).

Additionally, recent shifts in assessment practices focus on integrating Higher-Order Thinking Skills (HOTS) into learning and evaluation. HOTS-based assessment aims to develop and measure students' critical, analytical, and creative thinking skills. This assessment emphasizes the ability to analyze information, evaluate multiple perspectives, and generate new solutions or ideas (Manurung et al., 2023). Designed to assess higher-level cognitive abilities, HOTS-based assessments target domains such as analyzing, evaluating, and creating (Shukla & Dungsungnoen, 2016).

Consistent with these developments, findings from a 2023 Community Service (PkM) activity indicate that teachers at SD Negeri Marga Mulya VI in Bekasi City urgently require training and guidance on developing assessment instruments. The primary aim of this PkM initiative is to equip teachers with the competencies needed to create assessment tools, particularly AaL, AfL, and AoL, aligned with HOTS and the *Merdeka Curriculum*.

The specific objectives of this PkM program include: (1) Facilitating teachers at SD Negeri Marga Mulya VI in designing assessment tools/instruments, including AaL, AfL, and AoL, based on HOTS, through training and mentoring; (2) Producing ready-to-use assessment tools/instruments for AaL, AfL, and AoL, based on HOTS; and (3) Disseminating HOTS-based AaL, AfL, and AoL assessment tools/instruments to educational units, school clusters, districts, and other relevant forums.

IMPLEMENTATION METHOD

Asset-Based Community Development (ABCD) was selected as the method for implementing this community service initiative. The ABCD approach in this program focuses on developing the potential of teachers in designing assessment tools/instruments (Haris, A., Helmi, H., & Wahyuni, A. S. A., 2023). These potentials were first identified through an analysis of the challenges and needs faced by teachers in carrying out the teaching and learning process. This needs analysis serves as the initial step in developing community service activities aimed at enhancing teachers' professionalism, particularly in creating instructional media such as learning videos (Indriani, R. S., 2023). This community service activity was conducted at SD Negeri Marga Mulya VI, located in the North Bekasi subdistrict, Bekasi City. The school comprises 327 students across 12 learning groups. It is managed by a principal, 18 class and subject teachers, and one school caretaker. The program activities included training, mentoring, and evaluating the outcomes in the form of assessment tools developed by the teachers. The workflow of the community service activities utilizing the ABCD approach is depicted in Figure 1 (Nirmala, S. D., 2024).

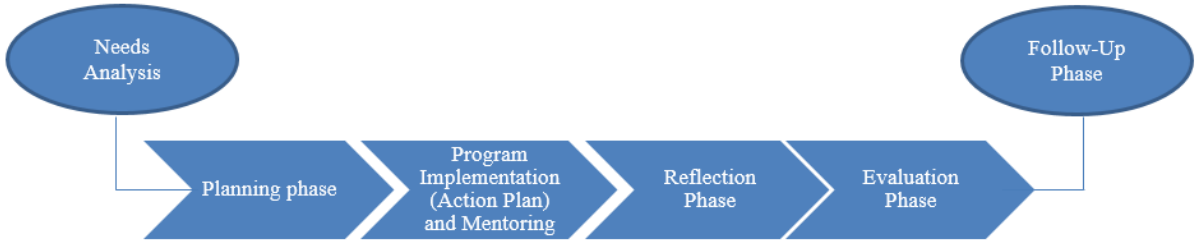

Figure 1. Flowchart of Community Service Activities Using the ABCD Approach

The implementation stages based on the ABCD approach in this community service program are as follows: (1) **Needs Analysis**. The needs analysis in this program is derived from reflection and follow-up on the results of the 2023 community service program, which focused on training teachers at the same school to create learning videos. The reflection highlighted the need for a similar initiative, but this time with a focus on developing assessment instruments. (2) **Planning Phase**. During this stage, a program plan is created to analyze all requirements for the community service activities. Planning begins with identifying problems and solutions based on the needs analysis. This phase also includes designing activities with detailed event schedules, a list of team members, and other preparations to ensure the program is implemented effectively and efficiently. (3) **Program Implementation (Action Plan) and Mentoring.** This stage is the core of the community service activities. Planned programs are carried out through several phases. The implementation focuses on training teachers to design both formative and summative assessment instruments, followed by mentoring to assist them in developing these instruments. (4) **Reflection Phase**. Reflection activities are conducted after the implementation phase, which includes training and mentoring. This stage evaluates the teachers' success in creating assessment tools. (5) **Evaluation Phase**. The evaluation phase assesses the extent to which the objectives have been achieved. Program evaluation also identifies the overall results of the implementation to gain feedback for future programs. This feedback serves as a foundation for adjustments, improvements, and considerations in preparing

for further dissemination and stabilization of the program outcomes among stakeholders. (6) **Follow-Up Phase**. This final stage involves gathering suggestions and inputs for future activities based on the evaluation results. These insights are intended to refine upcoming programs and ensure their alignment with teachers' professional development needs.

RESULTS AND DISCUSSION

This section discusses the results based on the series of activities conducted during the community service program at SD Negeri Marga Mulya VI, Bekasi City, carried out from April to September 2024.

A. Needs Analysis

The initial stage of the community service program (PkM) involved analyzing the needs of the host institution. The 2024 needs analysis was based on the evaluation results of the 2023 PkM activities conducted at the same school. The 2023 program focused on training teachers to create instructional videos. The evaluation concluded that the school required training for its teachers in designing assessment instruments based on Higher Order Thinking Skills (HOTS). This need is linked to the implementation of the Kurikulum Merdeka already adopted by the school. The emphasis was placed on developing both formative and summative assessment instruments. Based on this analysis, the program advanced to the planning phase.

B. Planning

During this phase, the team developed several preparatory steps based on the needs analysis. The planning phase produced the following outcomes: (1) Establishing a shared understanding of the steps, objectives, and roles of each team member; (2) Identifying the content to be delivered during the PkM activities; (3) Drafting a joint work plan and scheduling the implementation of the PkM activities; (4) Identifying requirements for the PkM execution, including grants to be provided; (5) Preparing the administrative documentation necessary for the PkM, including official forms and records; and (6) Ensuring all parties were prepared to effectively execute the PkM activities in alignment with the program's objectives.

C. Implementation and Mentoring

The implementation and mentoring phase consisted of three sessions. The first session was conducted on May 11, 2024, and included the following activities: (1) Opening Ceremony: This was followed by the signing of a cooperation agreement between the study program and the school; (2) Grant Distribution: The PkM team handed over a grant to the school; (3) Pre-Test Administration: A pre-test was conducted to assess the participants' initial understanding; and (4) General Lecture on HOTS-Based Assessment: A faculty member involved in the PkM program delivered an introductory lecture on HOTS-based assessments.

Figure 2. Activities of the First Session of the Community Service Program (PkM)

Based on Figure 2, during the first meeting, a grant in the form of books was handed over to complement the school's library, enriching reading materials for both teachers and students. Additionally, the first session of the material was delivered by the lecturer, focusing on HOTS-based assessment in the Merdeka Curriculum. Formative and summative assessments are crucial for teachers to understand as references for measuring the achievement of the learning process. Furthermore, assessments also serve as feedback and a reflection tool for teachers, students, and parents regarding students' learning progress. This is in line with the statement of Mujiburrahman et al. (2023), which emphasizes that the implementation of more comprehensive assessments to achieve established learning goals is highly expected, facilitating both students and teachers in achieving the intended objectives.

The second meeting was held on June 10, 2024. This session included a presentation of material by the lecturers and students involved in the community service activities, as well as discussions and exercises on preparing both formative and summative assessments. During this meeting, participants were assigned tasks to design assessment instruments, including initial/diagnostic cognitive and non-cognitive assessments, formative assessments, and summative assessments based on HOTS, in line with the implementation of the Merdeka Curriculum. The assessment instruments created were then evaluated and discussed in the third meeting.

The third meeting took place on August 24, 2024. Several activities were conducted during this meeting, including: (1) reinforcement of the material by the team; (2) posttest implementation; (3) announcement of the assessment of the HOTS-based assessment instrument preparation; (4) reflection on the community service activities; (5) evaluation of the activities; and (6) closing. After the reinforcement of the material, a cooperation agreement in the field of community service was signed between the Study Program and the school, followed by a thank-you note from the PkM team to the school.

Figure 3. Community Service Activities in the Third Meeting

The community service activities in the third meeting presented the results of the participants' pre- and post-tests. Fourteen out of the eighteen teachers consistently participated in both the pretest and posttest. The results of the pretest and posttest are visualized in the following graph.

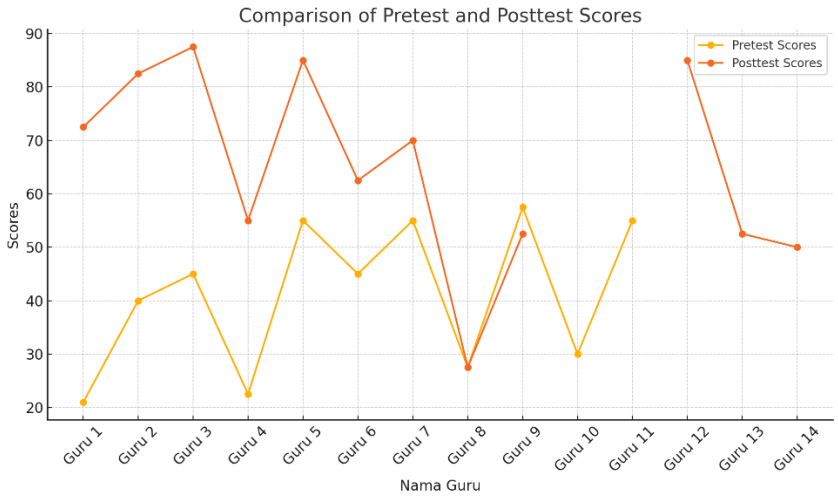

Figure 4. Comparison of Pretest and Posttest Scores

The graph shows a comparison of pretest and posttest scores for each participant. It illustrates individual score improvements, making it easier to observe the overall trend of score enhancement from the pretest to the posttest. This provides a clear picture of the progress made by each participant after undergoing the learning or training process. On the horizontal (x) axis, the names of the participants are displayed, identified as Teacher 1, Teacher 2, and so on. The vertical (y) axis represents the score achieved by each participant in both the pretest and posttest. A yellow line is used to indicate the pretest scores, while an orange line represents the posttest scores. This color differentiation clearly shows that the majority of participants experienced score improvements in the posttest compared to their pretest scores. However, there is variation in the degree of improvement across participants, indicating that individual progress may vary.

The average pretest score achieved by the participants was 41.23, while the average posttest score increased to 65.21. This reflects an average increase of 23.98 points from the

pretest to the posttest, which represents a significant development. Additionally, the average score gain, calculated from the change in scores for each participant, was 25.17. Nevertheless, this score gain shows a wide range, with the minimum gain being -5 and the maximum gain reaching 51.5. This indicates that the improvement for each participant varied. In the pretest scores, the lowest value was 21.0 and the highest was 57.5, while in the posttest, scores ranged from 27.5 to 87.5.

During the third meeting, in addition to conducting the posttest, the participants also received feedback on the assessment instruments they had developed, which were assigned between the first and third meetings. The assessment instruments created by the PkM participants were evaluated based on the following criteria: (1) alignment of the assessment with the objectives; (2) alignment of the assessment with the material; (3) alignment of the assessment with students' abilities based on grade/level; (4) alignment of the assessment with HOTS criteria; and (5) completeness and diversity of the assessment instruments. The results of the assessment instrument development by the teachers are shown in the table below.

Table 1. Scores of Assessment Instrument Development Results

No.	Nama Guru	Kriteria yang Dinilai					Jml Nilai	Rata-rata
		1	2	3	4	5		
1	Guru 1	87	88	88	85	88	436	87,2
2	Guru 2	85	87	87	80	75	414	82,8
3	Guru 3	90	90	90	88	90	448	89,6
4	Guru 4	88	90	88	87	90	443	88,6
5	Guru 5	85	87	87	88	85	353	70,6
6	Guru 6	85	85	86	87	80	423	84,6
7	Guru 7	90	92	90	88	92	452	90,4
8	Guru 8	80	80	85	80	80	405	81
9	Guru 9	80	85	85	80	80	410	82
10	Guru 10	80	80	80	75	75	390	78
11	Guru 11	80	80	80	80	80	400	80
12	Guru 12	80	85	85	83	80	413	82,6
13	Guru 13	80	84	80	75	75	394	78,8
14	Guru 14	82	80	80	75	80	397	79,4
							Rata-rata	82,5

Based on the assessment results of the instruments developed by the teachers, the average scores varied, with the highest score achieved by Teacher 7 (90.4) and the lowest score by Teacher 5 (70.6). Overall, the total average score was 82.5, indicating that most teachers were able to develop assessment instruments of good quality. The overall assessment results show that the majority of teachers have good skills in developing both formative and summative assessment instruments, with an average score of 82.5%. However, some areas require improvement, such as enhancing the ability to create HOTS-based questions, ensuring alignment with teaching materials, and ensuring diversity in assessment instruments. Teachers are encouraged to focus more on developing questions that foster higher-order thinking skills, while also ensuring that the questions are relevant to the content and the students' abilities. By improving these areas, the quality of the assessment instruments developed by the teachers can significantly enhance the effectiveness of classroom learning.

Based on the analysis of the formative and summative assessment tools created by the teachers, it is evident that most teachers were able to develop assessment instruments that met the established criteria, although some aspects still need improvement. The average scores indicate that most teachers have a solid understanding of the importance of aligning assessments with learning objectives, the materials taught, and students' abilities according to their grade level. However, there are still a few teachers who need to improve the alignment of their assessments with HOTS criteria and the diversity of assessment instruments used. HOTS criteria, which assess critical, analytical, and creative thinking skills, are crucial for shaping students who are not only able to memorize material but can also apply it in more complex contexts (Markhamah, N., 2021).

The importance of developing good assessment instruments, both formative and summative, lies not only in evaluating students' competency achievements but also in providing effective feedback during the learning process. Formative assessments, conducted throughout the learning process, allow teachers to identify students' understanding and difficulties in real time, enabling them to adjust teaching strategies according to students' needs (Elbasyouny, T. R. B., 2021). Formative assessment can be used as an informative tool for the learning process that has been implemented (Andika, R., Erita, Y., & Ningsih, Y., 2024). Meanwhile, summative assessments conducted at the end of a learning period serve to evaluate final learning outcomes and form the basis for making decisions in educational evaluations, including determining student graduation (Efendi, M., et al., 2024).

However, diversity in assessment instruments is also essential to ensure that various aspects of students' competencies are effectively measured. Teachers must ensure that the questions developed do not only assess factual knowledge but also students' analytical and creative abilities in solving more open and complex problems. Therefore, the development of assessment instruments that encompass various types of questions, both cognitive HOTS-based questions and those measuring basic skills, is crucial for enhancing the quality of learning and achieving broader educational goals (Wahyuni, K. S. P., et al., 2020).

Overall, the analysis indicates that while most teachers already have a good understanding of how to develop assessment instruments, there are still areas that require attention to ensure that the assessments reflect optimal learning quality and align with broader educational objectives. Through continuous improvements in developing both formative and summative assessments, it is expected that the quality of teaching can continue to improve, and students can develop competencies more holistically.

D. Reflection

This section presents the responses from the participants of the PkM (Community Service Program) at SDN Marga Mulya VI Kota Bekasi, which were filled out through a Google Form. The complete responses from the participants are displayed in the table below.

Table 2. Participant Responses to the PkM Activity

Participant	Response
G1	The material presented by the facilitators is very beneficial for teachers, especially in preparing assessments in the classroom.
G2	The presentation of the material was clear, easy to understand, and helped participants follow the training.
G3	The training session was well organized and targeted, making it beneficial for our daily tasks. We hope there will be more PkM activities in the future with other useful topics.
G4	We hope there will be more PkM activities with other beneficial topics.
G5	This activity has helped teachers in preparing assessment tools.
G6	We look forward to the next PkM activity on other topics that will expand our knowledge.
G7	In the future, we hope there will be more PkM activities with extended time allocation, so the sessions can be more comprehensive.
G8	This activity has provided new knowledge, especially for teachers on the assessments that need to be done.
G9	This activity should continue in the future because it is very useful for teachers, especially on differentiated learning topics.
G10	In the future, we hope you can continue to assist us with other topics.
G11	We hope that PkM activities will be held annually at SDN Marga Mulya VI, especially regarding differentiated learning, which is still unclear.
G12	Hopefully, PkM won't stop here, and there will be other useful knowledge given to the teachers, as we really need new insights.
G13	This activity is very useful, especially the new knowledge on assessments.
G14	This activity is very beneficial for teachers in improving the quality of teaching. We hope there will be similar activities with different topics.

Based on the feedback from the participants of the PkM activity, it can be concluded that this activity provided significant benefits for the teachers, especially in enhancing their understanding of assessment preparation and its implementation in teaching. The majority of the teachers found the material presented to be very useful, particularly in preparing assessments for the classroom (as mentioned by G1) and providing new insights related to assessment techniques (as stated by G8). The presentation of the material was considered clear and easy to understand by most participants (as expressed by G2), which helped them follow the training and gain practical knowledge.

Additionally, many participants expressed a desire for future PkM activities to continue with other topics that are beneficial and relevant to teachers' needs in the future. Responses from G3, G9, and G6 show a strong desire to continue training on new topics that can broaden their knowledge, such as differentiated learning, which remains a topic of great interest (G11). Some participants also suggested extending the duration of the activities, as mentioned by G7, so that the material presented could be more comprehensive and in-depth. Overall, the participants highly valued this activity and expressed hope that PkM will continue to be conducted with diverse and more in-depth material to support their professional development in the future.

E. Evaluation

The evaluation of the Community Service (PkM) activity shows that the training had a positive impact on improving teachers' skills, particularly in designing assessments and differentiated instruction. The majority of participants considered the material presented to be highly relevant and beneficial, and it could be directly applied to their classroom teaching activities. This aligns with previous findings, which suggest that well-targeted and needs-based PkM activities can enhance teachers' skills and professional competencies (Daeng, K., 2023).

However, some areas still require improvement for future training sessions. Many participants expressed a desire for longer training durations to cover more in-depth material and provide more opportunities for practical application. Additionally, there were requests for more varied content, covering other topics that are relevant to current developments in education. Overall, this PkM activity successfully contributed to teachers' professional development, particularly in the area of designing more effective assessments. To enhance the effectiveness of future training, ongoing development based on participants' feedback would be highly beneficial. This would ensure that the training can have a broader and deeper impact on teachers, ultimately improving the quality of classroom teaching.

F. Follow-up Actions

Based on the evaluation results of the PkM activity, the following follow-up actions are recommended: First, increasing the duration and depth of the training in the future. Participants expressed a desire for longer training sessions and more comprehensive materials, such as classroom management strategies and the use of technology in teaching. Continuous mentoring is also highly needed to ensure the effective implementation of the material taught in the classroom, as well as to provide space for teachers to reflect on their teaching practices.

Lastly, ongoing evaluation should be conducted to assess the extent to which the training is applied in daily practice, especially in the development of assessments. The results of this training and mentoring can be further developed by teachers through Teacher Working Groups (KKG), which are now often referred to as Learning Communities (Kombel). Through these Kombel activities, teachers at SD Negeri Marga Mulya VI Kota Bekasi can engage in in-depth discussions to develop a variety of HOTS-based assessment tools.

The implications of this activity are that teachers will be able to create both formative and summative assessment instruments to assess and analyze the achievement of learning processes. These assessments will function as evaluation tools and a basis for follow-up actions in teaching.

CONCLUSION

The Community Service (PkM) activity at SD Negeri Marga Mulya VI has successfully contributed significantly to equipping teachers with the competencies needed to develop HOTS-based assessment tools that are relevant to the implementation of the Kurikulum Merdeka**.** This program included training, mentoring, and evaluation of the development of assessment instruments, encompassing assessment as learning**,** assessment for learning, and assessment of learning**.** From this series of activities, it was identified that the majority of teachers showed improvement in their ability to create assessment instruments that meet HOTS criteria, though there are still areas that need enhancement, such as the diversity of questions and alignment with learning materials. The evaluation results also revealed an increase in the average pretest and posttest scores, reflecting the success of this activity in enhancing teachers' understanding of formative and summative assessment development.

Through the Asset-Based Community Development (ABCD) approach, the project also successfully produced assessment tools that are ready for use by teachers while encouraging the dissemination of these assessment tools to schools, clusters, or other educational forums. Feedback from participants demonstrated enthusiasm and a need for similar programs in the future with longer durations and deeper materials, such as differentiated learning and classroom management strategies. Overall, this PkM has achieved its specific goals, namely to facilitate, improve, and disseminate HOTS-based assessment tools at SD Negeri Marga Mulya VI, while also opening opportunities for continued training to support the sustainable improvement of teaching quality.

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