



Subject-based lesson study supporting Merdeka Curriculum enactment: Findings from Malang City science teachers

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 2023-09-28 Revised: 2024-02-14 Accepted: 2024-02-18 Published: 2024-03-28</p> <p>Keywords Lesson study Merdeka Curriculum Professional development Subject teacher community</p>	<p><i>Developing teacher capability in implementing the Merdeka curriculum can take advantage of the activity of sustainable lesson study. Lesson study conducted at the subject teacher community provides a place for teachers to learn collaboratively to improve their professionalism. This study aims at present the findings of the implementation of a subject-based lesson study carried out among junior high school science teachers in Malang City, Indonesia, and expose their responses regarding the impact of this activity on their professional development in supporting the Merdeka Curriculum enactment. Teachers are actively involved and enthusiastic in participating in lesson study activities. The teacher stated that the implementation of subject-based lesson study was a forum for mutual learning and improving teaching skills so that it supported the implementation of the Merdeka Curriculum. Even so, continuous implementation accompanied by strengthening the principles of lesson study and learning principles that emphasize student involvement as well as developing students' thinking skills is needed. Finally, the constraints and expectations expressed by the teacher can be considered for designing a subject-based lesson study implementation model to form sustainable lesson study for learning communities in the future.</i></p>
<p>Kata Kunci Kurikulum Merdeka Lesson study MGMP Pengembangan Profesional</p>	<p>Lesson study berbasis MGMP pada pemberlakuan Kurikulum Merdeka: Temuan dari Guru IPA Kota Malang. Pengembangan kemampuan guru dalam penerapan Kurikulum Merdeka dapat memanfaatkan aktivitas lesson study yang berkelanjutan. Lesson study yang dilakukan pada komunitas guru mata pelajaran memberikan wadah bagi guru untuk belajar secara kolaboratif dalam meningkatkan profesionalismenya. Kajian ini bertujuan untuk menyajikan temuan pelaksanaan lesson study berbasis MGMP yang dilakukan pada guru IPA SMP di Kota Malang, Indonesia, dan memaparkan tanggapan guru mengenai dampak kegiatan tersebut terhadap pengembangan profesional mereka dalam mendukung pemberlakuan Kurikulum Merdeka. Guru terlibat aktif dan antusias dalam mengikuti kegiatan lesson study. Guru menyatakan bahwa pelaksanaan lesson study MGMP merupakan wadah untuk saling belajar dan meningkatkan keterampilan mengajar sehingga mendukung implementasi Kurikulum Merdeka. Meski begitu, diperlukan penerapan yang berkesinambungan disertai dengan penguatan prinsip-prinsip lesson study dan prinsip-prinsip pembelajaran yang menekankan pada keterlibatan serta pengembangan kemampuan berpikir siswa. Pada akhirnya, kendala dan harapan yang diungkapkan guru dapat menjadi bahan pertimbangan untuk merancang model pelaksanaan lesson study berbasis MGMP untuk membentuk lesson study yang berkelanjutan bagi komunitas pembelajaran di masa yang akan datang.</p> <p style="text-align: right;">Copyright © 2024, Saparuddin, et al This is an open access article under the CC-BY-SA license</p> <div style="text-align: right;">  </div>

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INTRODUCTION

Merdeka Curriculum has a big vision for transforming education in Indonesia. This curriculum aims at create an innovative and competitive education, liberate students from traditional teaching methods and give them the opportunity to pursue their interests and abilities (Anggraena et al., 2022). With a more adaptive and integrated



approach, students will be encouraged to develop 21st-century skills, such as problem-solving, critical thinking, collaboration, and communication (Mustapa et al., 2024; Sihombing et al., 2021). In addition, this curriculum pays special attention to forming solid character and strong national values to produce individuals with integrity, broad-mindedness, and readiness to face an increasingly complex era of digital transformation (Setiyaningsih & Wiryanto, 2022).

Teachers play a crucial role in implementing the *Merdeka* Curriculum. The teacher takes the primary role in facilitating student-centered learning, allowing students to explore their interests and talents (Azmi & Iswanto, 2021). Teachers must have more adaptive and creative pedagogical skills to present learning that is relevant, interesting, and aligned with student's development (Hasanah et al., 2022; Sari et al., 2021). In addition, teachers also act as guides and mentors, assisting students in identifying and developing their potential (Simamora & Pasaribu, 2023). By respecting individual differences and diversity, teachers in the *Merdeka* Curriculum can build an inclusive environment that fosters high learning enthusiasm (Hasanah et al., 2022; Simamora & Pasaribu, 2023). With commitment and dedication, teachers will play a central role in forming a generation with critical thinking skills, creativity, and social responsibility, ready to face future challenges with confidence and comprehensive abilities (Anggraena et al., 2022). Due to the teacher's vital role in implementing the *Merdeka* Curriculum, efforts to increase competency and continuous professional development are needed to carry out quality learning (Kusanagi, 2022).

Efforts to improve teacher capabilities in implementing the *Merdeka* Curriculum have been carried out in various ways, from government to practitioner organization initiatives. The initiative carried out by the government is through special training called the *Program Guru Penggerak* (Direktorat Jenderal Guru dan Tenaga Pendidikan, 2020), which acts as an agent of change in learning transformation (Purwono, 2021; Satriawan et al., 2021). In addition, a teacher learning and sharing platform (Kemdikbudristek, 2023a), and *Merdeka* Teaching Platform (Kemdikbudristek, 2023b) are also provided, which accessible by all teachers. On the other hand, school initiatives, and professional or practitioners organizations also independently organize in-house training activities (Fauzi, 2022; Irvani et al., 2023), webinars (Rohimat & Najarudin, 2022), and training conducted in subject teacher community (Khery et al., 2022; Lestari et al., 2023).

Subject teacher community (MGMP: *Musyawah Guru Mata Pelajaran*) is an independent teacher organization in Indonesia essential to improving teacher competency and professionalism. Subject teacher community provides a platform for teachers in one subject to collaboratively deepen their understanding of effective curriculum, teaching methods, and evaluation strategies (Sari et al., 2018; Wild et al., 2018). This teacher community has become a forum for several activities to improve teacher competence in implementing the *Merdeka* Curriculum (Camellia et al., 2022; Jannati et al., 2023). These activities are designing lesson plan or teaching modules (Krismiati & Fernandes, 2020; Rosmiati et al., 2023) and university service activities in designing learning strategies (Mahdiannur et al., 2022; Mustika & Hasby, 2022; Ni'mah et al., 2023; Sari et al., 2023), learning media (Aulia et al., 2022), and lesson study (Burhanuddin et al., 2023).

Lesson study is a collaborative approach of professional teacher development originated in Japan. This approach involves teachers working together on an ongoing basis to identify problems in student learning, designing effective learning strategies, carrying out observations of the designed learning implementation, and then conducting in-depth studies and reflections on the learning process that has been carried out to improve and develop the learning (Susilo, 2013). Lesson study activities show an impact on improving teacher skills and student learning quality (Cheung & Wong, 2014; Gómez et al., 2015; Willems & Van den Bossche, 2019) which have been conducted in several curricula since its inception was introduced in Indonesia, especially in junior high school science subjects (Saito et al., 2006; Suratno, 2012).

Two forms of lesson study implementation have been employed in junior high school science subjects. First, a school-based lesson study is one that is conducted by science subject teachers alone or in conjunction with other subject teachers in a single institution (Suratno, 2012; Susilo et al., 2011); and the second, subject-based lesson study that conducted by teachers assembled in the particular subject teacher community, often just includes one subject teacher (Suratno, 2012). In the previous curriculum, school-based lesson study improved teacher performance in implementing science learning (Bungai et al., 2019). Subject-based lesson study also have been proven on increasing science teacher skills in carrying out the learning process, which impacts the quality and process of student learning (Hajar & Hendayana, 2019). Since the *Merdeka* Curriculum was enacted, practitioners have reported school-based lesson study implementation, which show an increase in junior high school students science learning outcomes (Amrilizia et al., 2023) and improve the quality of the science learning process (Chamisijatin & Zaenab, 2022). However, limited practitioners report subject-based lesson study for junior high school science teacher professional development since *Merdeka* Curriculum enacted.

One of the science subject teacher communities that has become a pioneer in implementing lesson study in Indonesia is in Malang City. The preliminary survey that we conducted with those administrators stated that the lesson study had been implemented through university service activities but was in the blended form (online and onsite) due to COVID-19 pandemic circumstance. Furthermore, lesson study was rarely conducted in this community before. Therefore, efforts are needed to reinstate lesson study activities in the junior high school science subject teacher community in Malang City to instill a professional learning culture to support the implementation of the *Merdeka* Curriculum.

Subject-based lesson study activities for science teachers in Malang city align with Sustainable Development Goal (SDG) target 4: quality education and lifelong learning. These activities enhance teachers' capacity to deliver high-quality instruction, thereby positively influencing student learning outcomes (Cheung & Wong, 2014). Additionally, lesson study

activities promote equal student participation, ensuring that every student gains a quality education (Saito & Atencio, 2015; Shanmugam et al., 2020). This aligns with SDG target 4.1, which aims at provide all students with an equitable and high-quality education leading to effective learning outcomes. Furthermore, these activities contribute to achieving SDG target 4.c by improving teacher qualifications by 2030 (Bengtsson et al., 2020; Yoshida, 2020).

The background described leads to the question, "Is the implementation of subject-based lesson study able to support the implementation of the *Merdeka* Curriculum based on the response of science teachers at junior high school in Malang City?". This paper aims at explain the findings of the implementation of subject-based lesson study and reveal the responses felt by teachers regarding its impact on supporting the implementation of the *Merdeka* Curriculum for junior high school science teachers in Malang City.

METHOD

This study is a case study of the implementation of lesson study, which was conducted at junior high school science subject teacher community in Malang City. Lesson study activities are carried out through collaboration between the junior high school science subject teacher community in Malang City and the Doctoral Study Program in Biology Education, Universitas Negeri Malang. The activity was conducted at SMP Negeri (Sekolah Menengah Pertama Negeri: State Junior High School) 26 Malang City in November 2022. The participants in this activity were teachers gathered in the junior high school science subject teacher community in Malang City.

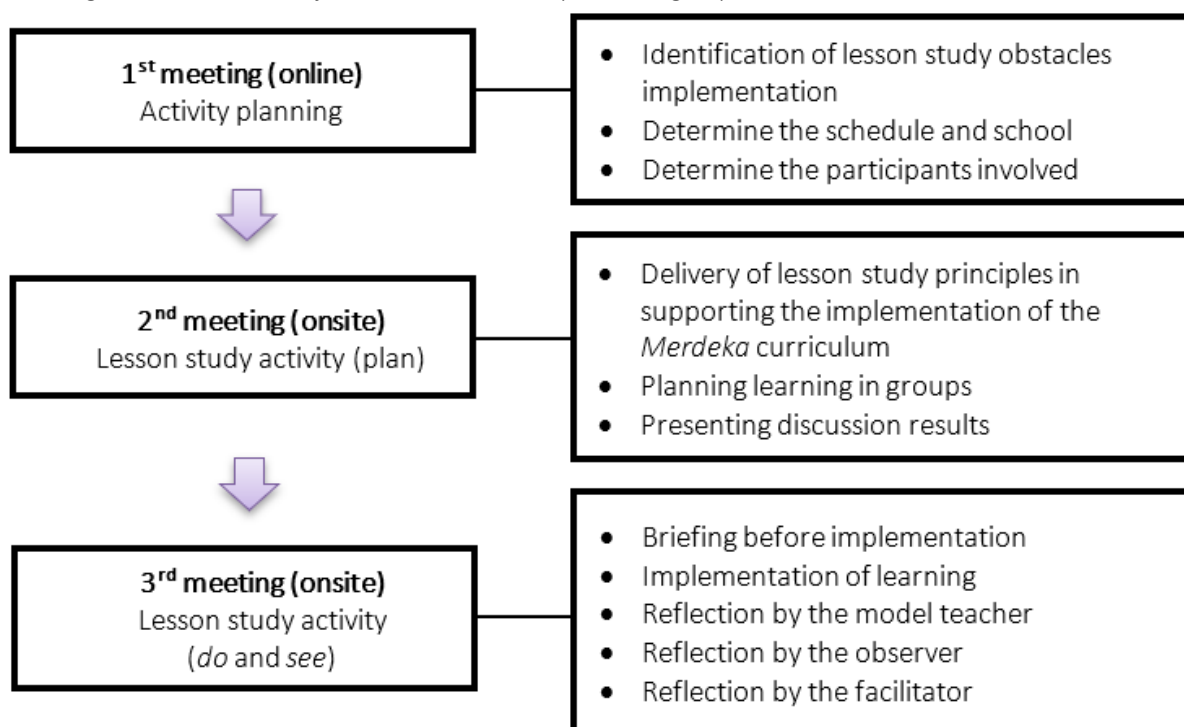


Figure 1. The flow of implementing subject-based lesson study activities

Lesson study activity consists of designing learning (plan) and implementing designed learning or research lesson (do and see) (Figure 1). The designing learning activity (plan) was carried out on November 9th, 2022. This activity consisted of conveying lesson study principles and techniques, forming groups of teachers, designing lesson plan in groups, and presenting the designed lesson plans from each group. Research lesson activity occurred on November 16th, 2022. This meeting consists of a briefing before the implementation of activities, learning and teaching in each class by each model teacher and observation of learning by each group member, delivery of reflections by the model teacher classically, reflection by observers led by the moderator in each group, and final reflection by the facilitator.

The data for this study were obtained from observations, field notes, and documentation of lesson study activity. The facilitator takes this data, which is distributed to several groups. The facilitator also acts as an observer in each class of learning implementation. At the end of the reflection activity, we gave a reflection questionnaire in the form of five open-ended questions to the teacher. This questionnaire is intended to find out teacher responses, impressions, constraints, and suggestions for implementing lesson study to support the implementation of the *Merdeka* Curriculum.

Data obtained from observations, field notes, and documentation is narrated collaboratively through Google Docs to describe events during the activity. Data interpretation is also carried out collaboratively to obtain valuable findings from implementing activities. In addition, the teacher's response to the questionnaire was coded. This activity is carried out to find the similarity response in the teacher's answers. Coding is done manually, inputted into a spreadsheet program.

RESULTS AND DISCUSSION

In this section, we initially narrate the implementation of the subject-based lesson study activities and present the findings during the activity. The support for the implementation of the *Merdeka* Curriculum from the MGMP-based lesson study activities felt by the teacher obtained from the coding of the questionnaire results is presented in the reflection section. Finally, we discuss the findings obtained for the development of further studies.

The lesson study activities were implemented after obtaining an agreement on the place and schedule for implementing the activities between the facilitator and subject teacher community administrator as well as Malang City junior high school science teachers. Not all teacher community members can join in activities regarding pandemic condition and limited supported facilities. The teacher fills out an online willingness to participate form in the activities the administrators circulate. Participants in this activity amounted to 42 teachers.

Planning stage (plan)

The implementation of lesson study begins with a planning agenda (plan). The activity began with an opening by the MGMP administrator. The facilitator conveys the purpose of the activity and directs participants to form heterogeneous groups for lesson planning. Four groups were formed with 10-11 members, who were science teachers from several junior high schools in Malang City. Each group, guided by the group leader, discusses determining the topic and lesson plan. The topic of learning is about Heat, adjusting to grade VII lesson which are known from science teacher who teaches at the school where the activity is carried out.

Each group agrees on the learning design and equipment needed. The teachers discuss the learning activities and collaboratively create teaching modules consisting of lesson plans and student worksheets. In addition, the media, tools and materials needed for the practicum were also discussed. Each group share their tasks in preparing learning.

The group representative conveys a designed lesson plan at the forum. Participants from other groups are allowed to respond. After the presentation, the discussion on the lesson plan continued online through the message groups for each group. The facilitator provides the suggestion needed from the lesson plan made by the teachers. Each group determines the materials, models and learning activities agreed upon by group members and the facilitators (**Table 1**). Discussion activities are continued through message groups to complete the learning design.

Table 1. The lesson plan for each group of teachers

Group/ Class	Teacher	Topic	Learning Model
I/7A	SNK, S.Pd.	Temperature, Heat, and Its Changes	<i>Discovery learning</i>
II/7B	VDN, S.Pd.	Heat Changes	<i>Discovery learning</i>
III/7C	FDH, S.Pd.	Heat Changes	Guided Inquiry
IV/7F	A, S.Pd.	Heat	Guided Inquiry

In planning activities (plan), we found some findings. Findings in planning activities emphasize on learning design. Some groups design teaching modules based on documents that have been made before. It causes not all teachers to discuss compiling and providing suggestions on lesson plans in groups. Several groups that designed learning from the beginning showed active discussion among group members. Discussions on improving teaching modules through online platforms have yet to be optimal. Discussions on online platforms focus more on providing tools and materials than on providing input on the design of teaching modules.

The teachers expect a recommended learning model. There are questions from the teacher regarding whether there is a specific learning model that is determined to be designed for learning. The facilitator said there was no specified learning model, but the learning design had to maximize students' thinking abilities to find concepts constructively. Depending on the features of the topic, each group of teachers is allowed to choose its learning model. The facilitator provides some suggestions on the teaching modules prepared by the teacher to carry out two-phase learning. The first phase is sharing tasks; the tasks aim to maximize student collaboration and encourage inclusive engagement, and the second phase is challenging tasks (jumping) to maximize students' thinking skills. The learning topic for each group is Heat. Overall, groups carry out practical learning that requires providing tools and materials. The teacher took the initiative to bring tools from their respective schools because of the limited practicum tools in the learning implementation school.

Not all teachers who participated in this lesson study activity had seen or carried out lesson study before. Therefore, it is essential to remind teachers of the fundamentals of putting lesson study into practice. Some teachers expect a standard observation sheet for learning observations. The facilitator explains that no standard observation sheet is given during the lesson.

Implementation stage (do)

Based on the prepared lesson plan, the model teacher implements learning in a predetermined class. Other group members observing the learning process. Following the learning timetable, each model teacher and their group went into

a specified classroom. The model teacher introduced himself/herself at the beginning of the lesson and continued by giving trigger questions. Learning begins with questions and answers to know students' initial abilities and then continues with conducting experiments to obtain learning concepts (Table 2). The teacher designed the lesson as well as possible, but students had difficulty formulating heat equations based on experiments in class. Based on this finding, it is known that initial studies related to student abilities are critical as a reference in choosing material and emphasizing fundamental material.

Several findings were obtained related to observations made by teachers regarding the learning process. The initial briefing before the implementation of learning aims at refresh the essential principles of observation. It was carried out based on the teacher's request in the previous meeting. The facilitator provides a summary of the principles of implementing observation and reflection by the observer and the principle of conveying reflection by the model teacher. The observer teacher is free to observe student learning but still adheres to the principles of implementing the observations given. Observations emphasized focusing on one to two groups of students to find patterns of student to find patterns of student communication and group collaboration. In this way, the teacher's movements that might interfere with learning can be minimized.

The principle of carrying out observations given to teachers positively impacts the teacher's ability conduct observations. The absence of a standard observation sheet used by the teacher while observing learning makes the teacher more deeply record every student interaction in the learning process. The teacher observes students more deeply because they only make observations focused on target students in certain groups. Some teachers are proficient in making observations, but some still interact with students in learning. Observers were found to assist teachers in giving instructions to students because they saw students being confused after the teacher delivered instructions to students classically.

Table 2. Learning activities carried out by the teacher

Group/ Class	Learning Activity Objective(s)	Experimental Activities Conducted	Pancasila Students Profile
I/7A	Students able to: 1. Explain the relationship between the mass of the heated substance and the required heat. 2. Explain the relationship between changes in temperature and heat required. 3. Explain the relationship between the specific heat of a substance and the required heat.	Measure the temperature of the water and oil heated every minute using a thermometer, and calculate the temperature change.	Critical reasoning Collaboration Independent
II/7B	Learners able to: 1. Investigate the heat transfer by convection. 2. Investigate the heat transfer by conduction. 3. Investigate heat transfer by radiation	1. Observe the movement of the dye in the heated water. 2. Heating a spoon with a Bunsen burner. 3. Bring butter close to a burning Bunsen burner	Critical reasoning Collaboration Independent
III/7C	Learners able to: 1. Explain the concept of conduction. 2. Explain how the concept of heat transfer in conduction	Observe the changes in the plastered plasticine hanging in three positions at the same distance on the heated spoon handle.	Critical reasoning Collaboration Independent
IV/7F	Students can explain and apply the heat formula.	Measure the change in water temperature at the time of boiling and after being left for five minutes with different volumes of water.	Critical reasoning Collaboration Independent

Reflection stage (see)

Every model teacher is allowed to reflect of their own learning. Although the model teacher generally expresses that learning is proceeding well, they are not entirely satisfied with the learning that has been accomplished. The instructional

strategy did not successfully encourage students to develop their heat equations from their experimental work. On the other hand, teachers said that the experiments had helped the students comprehend the concept of heat transfer.

The moderator of each group provides an opportunity for group members to convey the results of learning observations that have been carried out. The teacher dares to express his opinion openly and reflects in depth. Some teachers have focused reflection on student learning activities, but some still focus on how the teacher's activities are when carrying out learning.

At the end of the reflection activity, the facilitator gives a questionnaire on the teacher's response to the lesson study activity in supporting the implementation of the *Merdeka* Curriculum, which has been carried out in one cycle. The questionnaire results revealed that all teachers (35 who filled out the questionnaire) who participated in the activity agreed that the lesson study could be conducted sustainably to support the implementation of the *Merdeka* Curriculum in collaboration. The results of the teacher's response to the implementation of the lesson study felt by the teacher are then presented in Table 3.

Table 3. Teacher's reflection on the lesson study activities that have been followed

Aspect of Reflection	Coding	Frequency (n=35)
The teacher's perspective on lesson study supports the <i>Merdeka</i> Curriculum implementation.	<i>Learning spaces</i>	
	New experiences and ideas in learning	23
	Learn through collaboration	6
	Get examples of teaching modules	3
	A valuable lesson in teaching	2
	Alternative learning strategy	1
	Learn from model teachers	1
	<i>Teaching skills improvement</i>	
	Improve teaching skills	16
	Increase engagement	7
Perceived Impression	Fun and meaningful	18
	Very impressive	6
	Motivation in teaching	2
Perceived constraints	Time length of activity	8
	Student characteristics	7
	Lack of preparation	4
	No constraint	3
	Lack of experiment tools and materials	3
	Lack of class management	2
	School location	2
Hope	Held again in another school	13
	Greater preparation	8
	More efficient activity time	8
	Held every semester	3
	Research lesson (do) in model teacher school	3
	More technical coaching	1
	Held outside of teaching hours	1
	More participants	1
	Another model teacher	1

Implementation of lesson study has been executed at the Malang City science subject teacher community forum to support the implementation of the *Merdeka* Curriculum. In lesson design activities (plan), teachers are allowed to design teaching modules based on documents that have been made or create utterly new teaching modules. This activity was conducted onsite at school and continued online through group messages. Designing learning collaboratively allows for a lot of input and ideas to improve the quality of learning design (Wake et al., 2016). However, there is a tendency for this way of designing learning activities to be dominated by only a few teachers (Rozimela, 2020). Designing through an online platform provides flexibility for lesson study, but the challenge is that not all teachers contribute actively (Weaver et al., 2021). Teachers design the lesson by themselves, and asking for suggestions informally from colleagues at school can be done to streamline planning activities (Saito et al., 2015), but the role of the facilitator remains crucial in emphasizing essential learning principles in teacher designs (Preciado-Babb & Liljedahl, 2012).

The facilitator does not recommend any learning model but still reminds the teachers to adhere to the principles of learning that provide meaningful learning experiences, emphasize empowering thinking skills, and increase active student involvement. Allowing teachers to design their own learning according to the principle of independent learning increases teacher creativity (Sutrisno & Yulia, 2022). The designed lesson plans can be discussed with colleagues and facilitators to ensure that the learning principles are followed (Preciado-Babb & Liljedahl, 2012; Saito et al., 2015). In this way, the teacher's agency is acknowledged (Lieberman, 2009), the teacher's ability to design learning is trained (Preciado-Babb & Liljedahl, 2012), and the learning rights of each student are fulfilled (Schoenfeld et al., 2019).

It is necessary to remind the principles of lesson study when reinitiating the implementation of lesson study to strengthen the principles of implementing lesson study. The principle of lesson study that is done well can provide valuable lessons for improving the quality of learning and student learning outcomes (Klammer & Hanfstingl, 2019). On the other hand, lesson study principles that are not appropriately implemented can disrupt learning activities (Setyawan et al., 2019). Continuous implementation, followed by strengthening the principles of implementing lesson study, provides teachers with an understanding of the practice and essence of lesson study (Budiyanto et al., 2021).

In learning implementation activities (do), the teachers do not use an observation sheet that contains standard questions. Teachers are allowed to make their observation way but still adhere to the principle of carrying out observations. Performing observation with un-predetermined questions and focusing on one to two groups of students allows the teacher to record communication and interactions between students during the learning process (Warwick et al., 2016). In this way, the teacher can investigate students who are less involved in learning and start thinking about why this happens (Schoenfeld et al., 2019). These findings can be used as consideration for in-depth reflection by observers to improve further learning designs (Warwick et al., 2016).

Observers have focused on student learning in reflection, but observers are still found to correct teacher behavior. Reflection focusing on student learning activities in depth will reveal the factors that lead to success or cause student failure in learning (Widjaja et al., 2017). This insight is essential for teachers to know to improve future learning designs. Reflection that corrects teacher behavior causes the teacher to feel pressured and blamed, which can lead to decreased teacher motivation (Myers, 2012). In addition, reflections that tend to judge teachers cause teachers who act as observers to appear more competent and skilled than teachers who have dared to appear to teach in front of the class (Saito et al., 2015).

Teachers state that lesson study can support the implementation of the *Merdeka* curriculum as a forum for teachers to learn from one another and enhance their teaching skills. Evidence from previous studies also shows that the implementation of lesson study can facilitate teachers collaboratively designing learning objectives flow (*Alur Tujuan Pembelajaran*) (Purwasih et al., 2023) and designing and conducting learning (Numertayasa et al., 2023) especially with differentiated approach project-based learning (Amrilizia et al., 2023). Designing learning together, conducting research lessons, and conveying findings during reflection activities allows teachers to gain in-depth insight into the effectiveness of learning designs that have been made to improve student learning (Amrilizia et al., 2023; Susetyarini et al., 2021). In addition, teachers who act as model teachers develop their self-confidence, and open up teaching privatization towards more transparent learning, ultimately improving teaching skills through continuous improvement.

Teachers feel more involved in the community with lesson study activities. It makes some teachers encouraged in doing lesson study at their school. Almost all teachers show a positive impression of the implementation of lesson study. Teachers stated that the lesson study they participated in was fun and meaningful, so it motivated their teaching. Some evidence shows that present community activities tend to be passive, only focusing on completing administrative tasks (Rasuna, 2022). On the other hand, teachers who are members of the subject teacher community need activities that can further improve their skills (Burhanuddin et al., 2023). Lesson study in the subject teacher community allows teachers to actively improve their competence collaboratively (Susetyarini et al., 2021). Lesson study that is carried out continuously forms a professional learning community called lesson study for learning community (Saito et al., 2015). These activities give a meaningful impression to teachers, motivating them to improve their teaching because teachers have a place to learn from each other and share collaboratively (Salasiah et al., 2023).

Teachers reported several obstacles and expectations to be considered in future subject-based lesson study. A standard schedule at the beginning of the semester needs to be set related to dealing with the school of implementation place and the model teacher who acts. In this way, teachers can prepare early even though the learning planning and implementation schedules are close together (Setyawan et al., 2019). We argue that the place for implementing lesson study can be carried out in the teacher's school model and in the teacher model's classroom teaching so that the constraints on the place of implementation, the support of tools and materials, as well as problems related to student characteristics can be overcome.

In addition, it is impossible to facilitate all teacher in the community to participate in lesson study activities at once if there are many members. In this case, it is necessary to determine subgroups based on the closest area between the lesson study implementation school and the observing teacher. Teachers outside the region may become involved voluntarily. In addition, it is necessary to align the teaching schedule at school and the schedule for opening classes to avoid interfering with the teacher's primary task. As suggested Saito et al. (Saito et al., 2015), lesson design can be carried out by the model teacher and her/his colleagues at school so that the observer teacher is only involved in the research

lesson (do and see) sessions. In this way, lesson study activities can be carried out to form a voluntary teacher-professional learning culture towards sustainable lesson study for learning communities.

CONCLUSION

Junior High School Science teachers in Malang City actively and enthusiastically participated in implementing the subject-based lesson study. Teachers reported on the implementation of lesson study supporting the implementation of the *Merdeka* Curriculum as a forum for mutual learning and improving teaching skills. Implementation on an ongoing basis, accompanied by strengthening the principles of implementing lesson study, and expanding the study is needed. The constraints and expectations expressed by teachers in this study can be considered for designing subject-based lesson study activity models in supporting *Merdeka* Curriculum in the future.

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