

Pioneering Lesson Study Learning Community as an Accelerator Media of Differentiated Biology Learning

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ABSTRACT

Today's Biology teachers are required to develop students' potential optimally; the variety of learning modalities and multiple intelligences they have becomes an initial diagnosis of learning techniques to be applied. Differentiated learning is one of the models that can meet students' individual needs in learning. This research aims to describe the implementation of differentiated learning through Lesson Study activities to improve the quality of the learning process and students' learning outcomes. The research design used is a literature study with descriptive qualitative research. In this research, the author uses various literature sources, such as articles, books, and documents relevant to the analysis. The final result of this research is to describe the efforts to implement differentiated learning through Lesson Study activities carried out in cycles so that the quality of the learning process and student learning outcomes

Keywords: Differentiated learning, Lesson study, Learning outcomes.

INTRODUCTION

In Indonesia, the Government has launched an independent learning policy since 2020. Freedom of learning means "freedom" in the learning process. Freedom here can be interpreted as flexibility so that this independent learning policy will leave the standardization approach towards a heterogeneous approach that more fully enables teachers and students to explore the growing repertoire of knowledge. (Tohir, 2020); (Mustaghfiroh, 2020).

Learners are the leaders of learning in the sense that they are the ones who make teaching and learning activities meaningful, so learning will be adjusted to the level of learners' abilities and supported by various technologies that provide a personal approach to the learning progress of each learner, without ignoring the importance of socialization aspects and working in groups to foster social solidarity and soft skills. (Wiggins, 2017); (Kim & Wang, 2020). By emphasizing the centrality of learner learning, the curriculum formed by Merdeka Belajar policy will be characterized as flexible, competency-based, focused on developing character and soft skills, and accommodating the needs of the business world/ world of work (DU/ DI) (Purba et al., 2021).

The independent learning policy also requires teachers to be creative in planning and implementing the learning process so that flexible learning is formed (Mulyasa, 2021). One form of flexible learning is implementing

differentiated learning (Erickson, 2010). It states that differentiated learning at the school level is defined as learning that proactively involves students during the process and integrates students' various readiness, interests, and learning talents. Differentiated learning allows students to learn according to their interests, learning readiness, and learning profiles. Differentiated learning can support the national education goal of optimizing students' potential growth and development according to their individual characteristics (Pande Nyoman et al., 2022). Students can learn according to their learning style, and the teacher prepares various forms of learning processes and media, such as learning videos for auditory-type learners; then, the teacher also prepares reading materials related to the material taught. This reading material is suitable for visual-type learners, or the teacher can also prepare a case or phenomenon related to the teaching material to be solved together. Media like this is suitable for analytical type learners. With the diversity of media prepared by the teacher, students can learn together in different forms. The student work products produced in differentiated learning also vary depending on the learning process. Students will show optimal results if they learn according to their interests and learning styles (Herwina, 2021); (Ade Sintia Wulandari, 2022).

In differentiated learning, teachers must understand the characteristics of diverse learners in the classroom and create lesson plans that can facilitate learners' needs. Differentiated learning can be implemented by differentiating content, process, product, and learning environment. In preparing for differentiated learning, a diagnostic assessment of learners is needed to reveal the profile of learners' learning styles, learning interests, and learning readiness. If necessary, interviews can also be conducted to determine the background of learners' learning and family conditions. Teachers often forget student personal identification in developing differentiated learning, even though the primary key to differentiation used is based on the results of diagnostic tests. There are many things that teachers must consider in preparing differentiated learning so that in its implementation, it can run smoothly and optimally according to the needs of students and ultimately can unleash the potential/talent of each student.

The need for careful preparation from Biology teachers sometimes makes it challenging to implement differentiated learning. For this reason, a collaboration between teachers is needed in preparing lessons so that teachers can exchange ideas and get excited. Collaborative activities can be realized with lesson study. In lesson study activities, teachers jointly design differentiated learning (Plan Stage), alternately becoming model teachers in implementing differentiated learning (Do Stage). Teachers jointly reflect on the learning that has taken place (See Stage) to solve problems that occur in the learning process. Design it better in the next plan stage so that lesson study runs according to the Plan, Do, and See cycle. Ultimately, the quality of the learning process increases, accompanied by increased student learning outcomes.

Research conducted by (Sitorus et al., 2022) showed an increase in students' learning outcomes in class VIII SMP through the application of differentiated learning strategies. In addition, research has also been conducted (Sugiarti, 2022), which shows that 88% of students are very excited to implement differentiated learning because they produce diverse learning products. Similar research has also been reported by (Kamal, 2021), who gave the results of an increase in the activity and learning outcomes of mathematics students in class XI IPA. Some previous studies have shown that differentiated learning can improve students' learning outcomes at all school levels. However, research on implementing differentiated Biology learning through Lesson Study is still limited, so researchers aim to describe efforts to implement differentiated Biology learning at all levels of education through lesson study.

METHOD

This research method is a literature review or literature review. A literature review is a method used to collect data or sources related to a particular topic that can be obtained from various sources such as journals, books, the internet, and other literature. This literature review uses literature published in 2009-2022 which can be accessed in full text in pdf format and scholarly (peer-reviewed journals). The criteria for the journals reviewed were research journal articles in Indonesian and English with the theme of differentiated learning. The criteria for journals selected for review are journals in which there is a theme of differentiated learning. This literature review was synthesized using the narrative method by grouping similar extracted data according to the results measured to answer the objectives. Research journals that are under the theme are then collected, and a summary of the journal is made, including the name of the researcher, year of journal publication, country of research, research title, method, and summary of results or findings. Books, internet sources, and other literature also used the same method in summarizing the results (Herwina, 2021).

RESULTS AND DISCUSSION

Referring to the conditions where the COVID-19 pandemic has caused many obstacles in the learning process in education units which have a significant impact on the learning process (Kemendikbud-Ristek, 2022). There are several options for implementing the curriculum according to the conditions of each school. The government provides a choice of the revised 2013 curriculum, the emergency curriculum (simplified 2013 curriculum), or the independent curriculum. The independent curriculum can be an alternative to restoring learning after the COVID-19 pandemic. The independent curriculum accommodates student diversity, from student interests to learning profiles. Implementation of the independent curriculum can be done through the implementation of differentiated learning. This learning is done by providing learning materials that vary according to learners' understanding. The purpose of this differentiation is

so that each child can achieve the expected learning objectives (Joseph et al., 2013). Thus, competency-oriented learning requires varied and periodic assessments (Tomlinson & Moon, 2014). This learning approach is strongly emphasized in the Merdeka Curriculum. Differentiated Biology learning is a way or effort made by teachers to meet the needs and expectations of students (Kusuma, 2022). This is in line with Tomlinson's opinion (Herwina, 2021). According to Tomlinson, differentiated learning is an attempt to adjust the classroom learning process to meet each student's individual learning needs. However, teachers can still meet every student's needs, and does not lead to individualized learning, but differentiated learning can accommodate the needs of diverse students (O'brien, T & Guiney, 2001).

According to (Sutaga, 2022), three kinds of differentiation learning strategies are used: content, process, and product differentiation. Content differentiation can be based on student readiness, interest, and learning profile. Content (material to be taught), the teacher can divide students who need guidance can learn the 3 (three) most important things related to the material, for students who are pretty advanced can understand the whole material and for learners who are very advanced can be given enrichment (Tomlinson, Carol Ann & McTighe, 2006) Process differentiation is done by: 1) using leveled activities, 2) providing guides or challenges, 3) creating individual agendas for students, 4) varying the length of time, 5) developing a variety of activities that can vary various learning styles, 6) using flexible grouping according to readiness, ability and interest (Taylor, 2017) Process (how to teach), in the learning process and the form of assistance can be differentiated according to student readiness, for students who need guidance educators need to teach directly, for reasonably advanced learners can be started with modeling combined with independent work, practice, and review, for very advanced learners can be given some triggers for independent assignments to very advanced learners (Stavrou & Koutselini, 2016).

Product differentiation can be done by: 1) providing challenges and diversity or variation, 2) providing choices to students on how to express their desired learning. This is where teacher innovation is needed in creating differentiated learning to produce quality learning processes and products (outputs or performance that will be delivered), as stated by Kaur & Mohammad, 2018 (Westwood, 2016). Differentiated learning can also be done through the products produced. For example, students who need guidance can answer questions about the core content of the material, while those who are moderately proficient can make presentations explaining simple problem-solving, and those who are highly skilled can make innovations or examine more complex problems (Kaur & Mohammad, 2018).

The critical thing to note in conducting differentiated learning according to student readiness is that grouping students based on achievement or assessment results does not lead to the perception of categorizing students into groups that are "smart" and not. The formation of a "superior" group to a group that is considered the lowest ability can

lead to discrimination against students (Leighton, Jacqueline. P & Gierl, 2007). Those in the most marginalized groups will tend to see themselves as individuals who cannot learn like their peers. Similarly, educators often unconsciously have low expectations of students who are already considered less talented or less academically capable. As a result, they will continue to be marginalized. To avoid the negative impacts described above, things that can be done when grouping students for differentiated learning purposes according to their stage of achievement include the following.

- Small group learning is a standard method for students. There are times when educators divide groups based on interests (for example, the similarity of goods in sports games in PJOK subjects), make observations or experiments in science maps in groups that educators randomly assign, and so on, so that grouping based on academic ability in a meeting is expected.
- Grouping by ability changes according to the competencies that are the learners' strengths, is not permanent throughout the year or semester and does not apply in all subjects. For example, in Indonesian, student A is in a group that still needs guidance, but in science, student A is in a proficient group.
- For advanced students, more diverse challenges need to be considered; becoming a peer tutor could be one option, but it is essential to consider that not all students have the competence to teach, and the responsibility of facilitating remains entirely with the educator.
- There needs to be a variety of roles that students can choose to enrich or deepen the competencies built. For example, at the beginning of the school year, educators invite students to discuss what roles are needed. Each position can be taken by students in turn (Leighton, Jacqueline. P & Gierl, 2007).

For teachers to be able to condition so much preparation and hone their abilities in designing learning oriented towards learner outcomes, teachers need to develop skills in learning communities (Louis, K.S, & Leithwood, 2021). Learning communities in education units can be optimized by focusing on learning, cultivating collaboration and collective responsibility, and being results-oriented (student learning). Collaboration in education units can be done in several ways; according to (Steward et al., 2010), Teachers can collaborate and make decisions in the teaching and learning process in three critical areas: content, learning behavior, teaching practices, and behavior. One of the media for learning together in a learning community can be by using lesson study.

Innovation in designing lessons can be done better if teachers develop lesson plans together. Joint or collaborative learning design activities can be carried out through Lesson Study activities (Susilo, 2022). Lesson study is an action teachers take to see and improve the quality of learning faced by working with peer teachers. It consists of three stages known as Plan-Do-See. The overall stages include lesson planning, implementation, as well as observation, and reflection (Sairo, 2021).

Lesson Study (LS) is a professional learning process. It is successful because it focuses on learning and the progress made by children as practitioners develop specific teaching techniques designed to improve identified aspects of teaching and learning in their situation (Darmawan et al., 2017). LS has great potential to be a teacher professional development model in its implementation consisting of several stages (Rock et al., 2005). (Suratno, 2013) There are three stages of implementation, namely: 1. planning stage (Plan); 2. implementation stage (Do); and 3. reflection stage (See). The following is the implementation model of LS in implementing differentiated learning.



Figure 1. Implementation Stage of Differentiated Learning through Lesson Study (Source: Researcher Documentation, 2022)

Based on the chart above, it can be explained as follows, the Planning stage (Plan) is the first stage. The planning stage is an important stage, according to the researcher (Fujii, 2016). This is the crucial point of whether or not the learning improvement process will be carried out. Teachers who are members of LS collaborate to develop student-centered lesson plans. Planning begins with an analysis or diagnostic test of the needs, problems, and diversity faced (basic competencies, learning interests, and student learning profiles) in line with what was conveyed (Geel et al., 2019). Teachers collaborate with observers to find solutions to the problems found. Based on this analysis, teachers are expected to be able to consider the components of the lesson plan preparation to be applied to learning. At this stage, the decision is also made on which type of differentiation strategy will be carried out, whether to use content, process, and product differentiation.

The Implementation Stage (Do) is the second stage carried out, and the implementation stage has two activities; learning implementation activities are carried out by a teacher who is agreed or at his own request to practice the lesson plan/ Teaching Module (Setyawan, Dias; Shofiyah, Auliyah; Dimiantika, 2021) The second is the activity carried out by the

observer, namely making observations of learning activities. At this stage, the observer also observes the effectiveness of differentiated learning. The DO activity is the implementation of learning activities by the model teacher coupled with the observation of learning by lesson study team members or observers. This activity is used to practice the learning design and scenario, teaching materials, and media that have been prepared together by the lesson study team. Hopefully, all learning steps (scenarios) along with materials/media/tools that have been prepared can be used by teachers appropriately, proportionally and efficiently.

The next series of activities is to reflect (See); the reflection stage, according to (Vermunt et al., 2019), is a form of discussion followed by all lesson study participants guided by the chairperson. The discussion began with the teacher's impression of implementing differentiated learning. Then, all observers give feedback or suggestions on learning. Submission is accompanied by evidence obtained from observations, not based on opinion. This is intended as an effort to improve learning. The reflection session is essential in the lesson study cycle. After jointly making a PLAN that focuses on how students learn and observing the reality of student learning in the classroom in the DO session, in this SEE session, we will share what learning we get from students. A quality SEE session is indicated by how much and how deeply we learn from students. A quality SEE session reflects the quality of the lesson study activity.

The lesson study learning community in education units is expected to increase the capacity of educators. Simply put, a lesson study learning community in an education unit is an ongoing process in which educators in an education unit work collaboratively and in a structured way to improve the quality of student learning.

CONCLUSION

Evaluating biology learning that has been carried out should ideally be carried out on an ongoing basis. Acculturation of reflection on the learning process is potentially developed in the learning community in the education unit. The learning community is a means of learning; the school community will be a new paradigm, one of which is differentiated learning. Both process differentiation, content, and product differentiation will be well implemented when school members collaborate together in designing, implementing, and evaluating them with structured techniques. Lesson study activities: PLAN, DO and SEE will provide a solution for learning quality improvement techniques that are oriented towards student learning outcomes with a series of structured activities. Thus, it is expected that the implementation of lesson study will be an accelerator factor for implementing differentiated learning in the school environment. Schools can initiate the existence of a learning community at school. Then this learning community will be used by learning practitioners to improve the learning process, one of which is the implementation of differentiated learning. Technically, Biology teachers can initiate the design of

differentiated learning to be reviewed together with lesson study as a learning community media.

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