

Exploring the Impact of Lesson Study as a Collaborative Teaching Strategy in Higher Education

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Abstract

Lesson study is a class-based & collaborative continuous teacher professional development strategy to optimize student learning services. The aim of this study was to determine the impact of lesson study on improving the quality of learning in higher education. This research is a mix method research, which was conducted for one semester. Learning is carried out in a hybrid way in the odd semester of the 2021/2022 academic year in six plant physiology classes using Problem-based Learning (PBL). The research subjects consisted of biology education students and undergraduate biology students at the Universitas Negeri Malang. The research instruments include chapter design, lesson design, lesson plans, lesson study observation sheets, essay tests on cognitive learning outcomes. Lesson study is carried out in three stages, namely plan, do, and see. The results showed that the learning designed and implemented with lesson study showed an improvement in each meeting. Improvements in learning can occur because educators and observers reflect on learning activities.

Keywords: Lesson Study, Collaborative Teaching Strategy, Higher Education.



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Introduction

Education is organized to create skilled and globally competitive human resources. The development of digital technology and the demands of the 21st century require people to have life skills such as critical thinking (Lewin & Mcnicol, 2015; P21, 2015), creative thinking (Lewin & Mcnicol, 2015; OECD, 2017, 2021), communication (Malik, 2018; Pineida, 2011), collaboration (Child, 2016), scientific argumentation (Noviyanti et al., 2019), scientific reasoning (Kambeyo, 2017; Khoirina et al., 2018; Kuhn, 2011), and problem-solving (Rahman, 2019; Turiman et al., 2012). These skills can be empowered in classroom learning (Zubaidah, 2016).

Implementation of various learning designs in the classroom often experiences many obstacles and shortcomings, both problems for students, teachers, or parents (Sari & Yüce, 2020). The different learning styles of each student are also a challenge in teaching the material (Akram Awla, 2014). Good learning should be able to motivate and attract students to learn actively and collaboratively. Students' engagement will directly impact their achievements (Parsons et al., 2014). If students do not have good motivation and engagement, it is necessary to reflect or evaluate the course of learning. Therefore, it is important to do lesson study in learning.

Lesson study is a Japanese approach to teacher professional development (PD) that entails collaborative lesson planning, live lesson observation, and reflective discussion. Lesson study is becoming more popular as a method of teacher education and school improvement around the world (Godfrey et al., 2019). Lesson study provides an opportunity for educators to reflect on their long-held beliefs and begin to form new types of beliefs related to creating a meaningful learning environment (Inprasitha & Changsri, 2014). Lesson study is an area where educators and supervisors can learn through collaborative work. Supervisors can share their knowledge from theories in their career fields,

while educators gain knowledge from participating in their activities throughout the lesson study process. When the two work together, they can share knowledge and experiences with each other. The structure and collaborative work according to the lesson study process can create a system in transferring all experiences to develop the quality of new educators and supervisors in the project (Inprasitha, 2014). Lesson study has the potential to encourage increased teaching and learning and increase student learning outcomes (Ngang & Sam, 2015).

Method

Research Design

This research is a lesson study research that is used to improve plant physiology learning at the State University of Malang. Lesson study stages consist of three stages, namely, plan, do, and see (Kundariati et al., 2019; Susilo, 2013; Zubaidah, 2010). The picture of the lesson study stages can be seen in Figure 1.

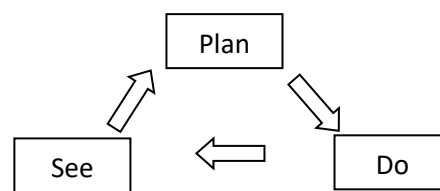


Figure 1. Lesson Study Stages

Learning is carried out using the Problem-based Learning (PBL) model according to (Arends, 2015), which consists of 5 learning steps, namely: (1) student orientation to problems, (2) organizing students to learn, (3) guiding individual/group investigations, (4) presenting the work, and (5) analyzing and evaluating the results of solving problems. The materials in this study consisted of: water and nutrient potential, photosynthesis, nitrogen assimilation, cellular respiration, growth and development, phytohormone, flowering, fertilization and photoperiodism, and movement in plants.

Participant Setting

Participants in this study were biology and biology education students of the Class of 2020 who took the Plant Physiology course in the odd semester of 2021/2022. There are three classes of biology students, namely class I, G, and H. Biology students are class A, B, and C.

Research Instrument

The research instrument consists of chapter design, lesson design, lesson plan, students' worksheet, and essay test. Prior to use, the research instrument was validated by biologists and plant physiologists. The research instrument was developed with the research team in stages. The lesson plan was developed with reference to the Semester Learning Plan (RPS) by lowering the SCPL as the basis for material development.

Data Analysis

The data analysis of this research used a qualitative descriptive technique. Funds obtained from observations and documentation are used as the basis for a comprehensive learning evaluation. The data obtained in this study are the results of observations of student activities, results of plan discussions, and results at the reflection stage..

Results and Discussion

Lesson Study as Professional Development (PD) in Indonesia

Lesson study is a learning improvement activity that was originally developed in Japan and is currently being developed in various regions in Indonesia. Lesson study is a model of coaching (training) the teaching profession through collaborative and sustainable assessments based on the principles of collegiality and mutual learning so that a learning community can be built (Zubaidah,

2010). Lesson study, a PD model has become increasingly popular in the last decade or so as a form of PD (Halvorsen & Kesler Lund, 2013; Hammersley-Fletcher et al., 2015; Lewis, 2006).

Educators conduct studies on learning planning, carry out the learning process in real classes, and conduct reflection discussions to get feedback in order to improve the next learning process (Syamsuri & Ibrahim, 2011). Educators not only research by giving treatment and then observing the impact on students, but also improve the continuous learning process. Lesson study has three main stages, namely planning (plan), implementation (do), and reflection (see) (Susilo, 2013).

International research shows that collaborative learning through lesson study is able to mobilize changes in learning and pedagogical practices and improve student achievement. Many studies highlight the benefits of educator collaboration through lesson study as confirmed by evidence from educators' testimonies and researcher observations (Cheng, 2019). Puchner & Taylor (2006) investigated some of the dynamics and capabilities of teacher change stimulated by lesson study by conducting two case studies involving two groups of educators in the US. They found that collaboration was beneficial for the learning process, but that collaboration could be compromised when conflicts arise between educators in lesson study groups. Furthermore, cooperation in lesson study can improve educators' self-efficacy and adaptability to change.

Lawrence & Chong (2010), identified educator collaborative learning through a structured approach and resulted in positive changes in the abilities of educators that enabled them to make the necessary changes to improve student practice and learning as a pathway to successful learning improvements. Chong & Kong (2012) conducting qualitative research on how lesson study accommodates the formation of effective collaborative learning to support the success of educators. The collaboration of educators in intensive and continuous professional development programs has a positive impact on the effectiveness of teaching carried out by educators. While successful educators focus on specific subject content, collaborative learning structures facilitate the acquisition of skills that can then be put into practice in the classroom. They also found that lesson study not only improved student achievement, but also educators' adaptability and adjustment. In addition, research on the implementation of lesson study in Indonesia has also been carried out.

Devi *et al.*, (2020) carry out lesson study to improve the quality of learning for students and to increase student activity. The results of observations on the implementation of lesson study show that the activity of students in each cycle has increased by adjusting the learning method which is the result of reflection and evaluation of the previous cycle. Indriwati *et al.*, (2018) examines lesson study on the implementation of the guided inquiry learning model to improve learning in Animal Diversity courses and to improve communication and student learning outcomes.

Lesson Study in Plant Physiology Course at Universitas Negeri Malang

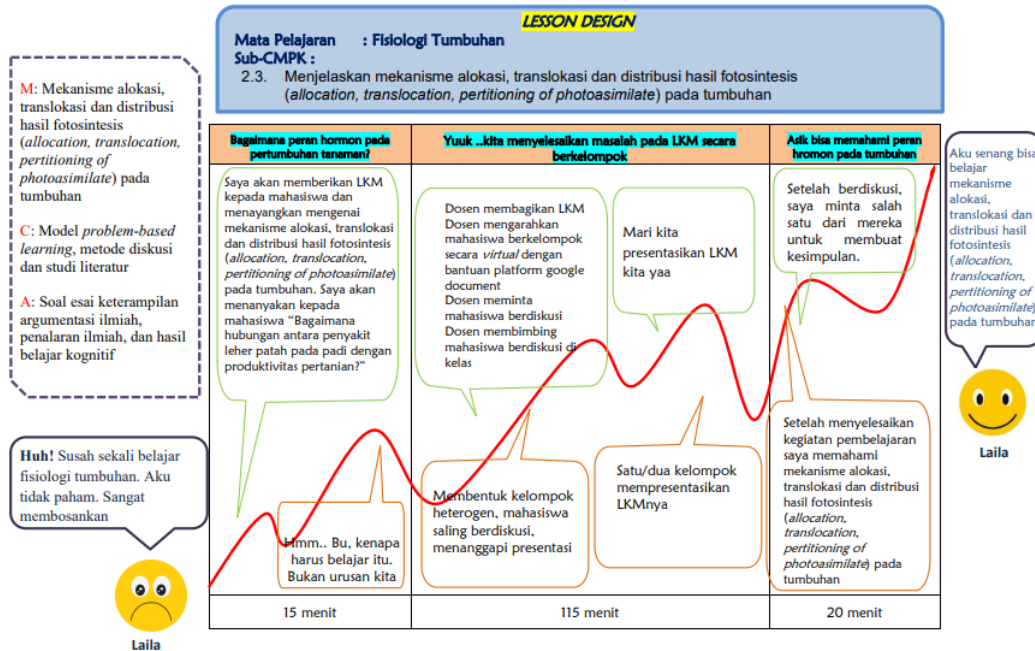
Based on the explanation above, lesson study has been proven theoretically and empirically to improve the learning process, improve the quality of learning, and improve the skills of students. The activities in each lesson study's steps as follows:

1. *Plan*

The *plan* stage is used to develop learning designs and learning tools which include chapter design, lesson design (sample of lesson study result can be shown in Figure 2), lesson plans, students' worksheets. We conducted the professional development program over six weeks and in one week there are two meetings. Scientific reasoning is empowered through PBL by providing trigger questions (problems) to be solved. The problem-solving process involves deductive and inductive reasoning activities. This lesson study activity is used to improve the performance and quality of learning. This effort is carried out collaboratively between subject lecturers, model lecturers, and observers through collaborative and sustainable learning assessments based on the principles of collegiality and mutual learning so that a learning community can be built (Zubaidah, 2010).

2. Do

The *do* stage is used to teach plant physiology using PBL according to Arends (2015) (Arends, 2015), which consists of 5 learning steps, namely (1) student orientation to problems, (2) organizing students to learn, (3) guiding individual or group investigations, (5) presenting the work/problem solving, (5) analyzing and evaluating the results of problem-solving.



Measurement of scientific reasoning skills is carried out using formative assessments at each meeting turn. The evaluation of measurement results is divided into three separate parts, namely the beginning, middle, and end of learning (research). Lecturers together with observers reflect on the lessons that have been implemented.

Figure 2. Lesson Plan in Plant Physiology Course

3. See

This activity is guided by a moderator which is preceded by the delivery of reflections by the model lecturer. Next, it is followed by the delivery of reflection by observation. The *see* stage is also used to convey lessons learned. Lesson learned is a document obtained from the learning process from the activities experienced. This can be obtained either from the experience experienced alone or from others. Lessons learned can be used as a document asset for individual continuous process improvement.

Conclusion

Lesson study is a class-based and collaborative continuous teacher professional development strategy to optimize student learning services. Lesson study is useful for developing learning models, developing learning media, developing teaching materials, and developing learning evaluations. The learning designed and implemented with lesson study showed an improvement in each meeting. Improvements in learning can occur because educators and observers reflect on learning activities.

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