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Improving Post-graduate Students Learning Activities through Lesson Study in Learning Forest-Prototype

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Keywords
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Improving learning quality in 21st can not be separated from contextual learning and student-centered learning paradigm. The contextual lesson study program conducted in learning-forest prototype to build a learning community. The objectives of this research were to improve learning activities of postgraduate students in Biology Education department and to build a learning community. The implementation of lesson study was conducted in the Biology Learning Innovation subject for postgraduate students while practicing to observe open lesson in the undergraduate students which used learning forest-prototype. The postgraduate students took roles as planner, observer, and reflector in the plan, do (open lesson), and see (reflection) activities. The implementation was done in three cycles in even semester of academic year 2015/2016. Students learned collaboratively and contextually. The postgraduate students' learning activities were observed by six observers from lecturer colleagues. The research results showed that the students were able to implement planning, open lesson, and reflection properly. The average of student's learning activity grade was 91.11% from all of students, with the grade averages for planning, open lesson, and reflection activities were 88.89%, 93.33%, and 91.11% respectively. The implementation of this lesson study in the learning forest-prototype can be done in other relevant subjects to strengthen learning activities.

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INTRODUCTION

Lesson study is an approach to improve learning quality and teacher professionalism development which is conducted by teachers in Japan. In conducting lesson study, teachers work collaboratively, learn curriculum, formulate learning objective, observe lesson research, and do reflection to perfect learning (Susilo et. al., 2009). This lesson study concept is in accordance with studies in Depdiknas (2009). According to Hendayana (2007) and Slamet et. al., (2010), lesson study is a model of educator professional development model through studies of sustainable and collaborative learning, based on mutually assisting collegiality principles in learning to form a learning community. This is an activity to study learning by teachers and their colleagues. The learning aspects to study include planning, conducting, evaluation, and learning reflection. In implementing lesson study, teachers can use varying methods or learning strategies according to situations, conditions, and problems the educators deal with. In this learning activity, collaborations occur between students; mutually learning, scrutinizing, and assisting (Masaaki, 2012; Manabu, 2012; Saito et. al., 2015).

Along with the importance of the learning community, contextual learning also emphasizes the importance of students' activities in the learning community, to develop the students' curiosities, to learn in groups, to build critical thinking ability, to transfer multidisciplinary knowledge, where information is collected, analyzed, and synthesized from varying sources and point of views. Contextual learning involves meaningful components, conducts meaningful works, cooperates, thinks critically and creatively, mutually assists students, and uses standard and authentic assessments (Johnson, 2009).

In accordance to learning community formation in the implementation of contextual learning, according to social constructivism theory, during learning process students experience conceptual changes as results of social and academic interactions. These conceptual changes, experienced by students, are enlightenment into more complex students' understanding and improvement of their critical thinking abilities (Depdiknas, 2002; Muhfahroyin, 2012). According to Ridlo & Alimah (2013) the student-centered learning of environmental exploration may be conducted using active- and cooperative-based strategies. Examples of these strategies are contextual learning, participatory learning, and inquiry learning.

Relationship patterns of classroom with outside environments are very much emphasized to synchronize knowledge had been built inside students through constructivism. Subsequently, this knowledge already possessed by students is reflected again for further developments through collaborative learning, self-finding, and mutual learning (Saito et. al., 2015). Similar with statement above, BNSP (2010) and Frydenberg & Andone (2011) state that learning in 21st need to be held with collaborative, creative and innovative learning. In other word, the teachers must prepare and plan overall to facilitate the students contextual, participatory, active, and creative in their learning.

There are many learning sources, which are able to empower students to understand science cognitively and psychomotorically, have been developed. However, real learning sources in nature (contextual), which are able to prepare students in cognitive, affective, and psychomotoric domains, and which are able to support environmental care character, are rare to develop. By a fundamental research, a learning source with initiation of a project based on critical land, which had no educational and economic values before, was developed (Muhfahroyin, 2013). This critical land was empowered for learning into a *forest prototype* with educative benefits and it was able to build environmental care characters for students. By having forest prototype learning activity, students were trained to think critically and creatively, to build environmental care attitude, work skillfully which represented cognitive, affective, and psychomotoric domains (Muhfahroyin, 2016). This forest prototype learning development supports natural environment issues such as global warming, climate change, and *save our earth* movement. Related to learning, this research is also in synergy with philosophies of constructivism, student centered learning, collaborative learning, and contextual teaching and learning. By this forest prototype learning, learning can be used as media and vehicle to implement lesson study.

The objective of this research was to improve postgraduate students' learning activities in implementing lesson study to build learning community. The benefits of this research were to increase lecturers and students insight in lesson study, as well as utilization of learning forest-prototype as a contextual learning resource for students.

METHODS

The research was conducted at Depart-

ment of Biology Education Muhammadiyah University of Metro in even semester academic years 2015/2016, start in March to July 2016.

The research population deals with 48 postgraduate students of biology education. Sampling was taken by purposive sampling to determine the class which is used as research locations consist of 18 students.

Learning implementation in this research was conducted in the biology learning innovation subject for postgraduate students of biology education. Postgraduate students took roles as planners in PLAN, observers in DO (*open lesson*), and reflector in SEE (reflection). Open lesson was conducted in plant morphology subject for undergraduate students. Lesson study activity was started with planning with an objective to produce a learning plan. Planning was conducted collaboratively between postgraduate students and undergraduate lecturers. Planning activity discussed lesson plan, student's activity sheet, student's observation sheet, and other learning instruments.

In conducting open lesson, postgraduate students took roles as observers for undergraduate students in learning of plant morphology. In the reflection activity, postgraduate students provide suggestions on findings when they observe undergraduate students' learning.

The instruments exerted to measure dependent variables in this research is observation, applied to have students learning activities in three cycles of lesson study (PLAN-DO-SEE). The data in plan session were activities of observing, questioning, answering, responding, and providing suggestion activity. The data in do session were observing, recording, finding unique matters, adjusting position at learning groups. The data in see session were observing, suggesting findings, responding, providing suggestions, and reflecting. The data collection steps in this research consist of as long as learning.

Research data were analyzed descriptively to describe postgraduate students' activities in implementing lesson study which included activities of planning, open lesson, and reflection.

RESULT AND DISCUSSION

The implementation of lesson study was conducted by postgraduate students in three activities of lesson study cycles, namely PLAN-DO-SEE. Explanation of the result and discussion is as follows.

Students' Learning Activities in Plan

The learning was started with planning to produce lesson plan. Planning was conducted collaboratively by lecturers who delivered the subject, other colleague lecturers, and 18 postgraduate students in biology education department. Planning discussed lesson plan, student's activity sheet, student's observation sheet, and other learning instruments. In this planning activity, postgraduate students did activities and it was recorded to determine percentage of activities had been done. Research data of learning activities in PLAN is show in Table 1.

Table 1. Percentage of Students Learning Activities in PLAN of Lesson Study

Activities	Amount	
	Participants	Percentage (%)
Observing	18	100.00
Questioning	15	83.33
Answering	14	77.78
Responding	16	88.89
Providing suggestion	17	94.44
Average		88.89

Planning was conducted to obtain better learning preparation. All participants in planning activity conducted positive activities. High percentage of observing, questioning, answering question, responding, and providing suggestion activities were indicators of active participations and enthusiasm of participants in planning activity. Planning discussed all related matters to do in learning. It was in accordance with Kemdiknas (2012) that lesson plan, student's activity sheet, learning instruments, lay out of learning students, observation sheet, list of participants in learning groups were prepared in the planning. Here participants were mutually listening opinions and suggestions for conducting contextual learning. It was not only simulation, but a real learning (Johnson, 2009; Muhfahroyin, 2007).

Based on previous understanding, all observers actively observe planning activity properly and contextually. In addition, observers also understood forest prototype learning which was conducted by the model lecturer (Muhfaroyin, 2013). As beginner teachers, the postgraduate students needed training about lesson study implementation. Similarly, Chichibu (2016) stated that beginner teachers needed to be trained to develop their instructional and critical thinking skills. Further, Monnier (2016) explained that to

implement lesson study, training for the prospective teachers was required, so that as a training approach lesson study could facilitate practices and theory articulations and allowed teachers to improve students' learning qualities.

Students' Learning Activities in DO (Open Lesson)

Open lesson is the implementation of planning stage in the real and contextual learning. Eighteen postgraduate students took roles as observers in the undergraduate students' learnings on plant morphology subject. Postgraduate students' activities were observing, recording, finding unique matters, adjusting position at learning groups. Data of the learning activities in DO (open lesson) is shown in Table 2.

Table 2. Percentage of Students Learning Activities in DO (open lesson) of Lesson Study

Activities	Amount	
	Participants	Percentage (%)
Observing	18	100.00
Notting	18	100.00
Recording	14	77.78
Finding unique matters	18	100.00
Adjusting position	16	88.89
Average		93.33

The average percentage of postgraduate students' activities as observers during learning was 93.33% (very good) from total of postgraduate students. As observers, postgraduate students had been prepared with methods of being good observers. Learning conducted by the model lecturer was not only simulation of lesson study, but it was a real learning. Observers should be able to do their roles properly, carefully, and precisely (Kemdiknas, 2012). Observers should be able to observe all students' activities in learning and record unique findings during learning. In order to observe properly, the observers adjusted their standing positions to avoid disturbing students in their learning and to facilitate observations.

With a good planning at lesson study, learning outside classroom would be able to improve students' learning activities. Good learning planning would crea7 good learning process. Similarly, Mellvig & Nilsson (2015) stated that there was no difference between traditional classroom teaching and outdoor teaching. According to researchers, no matter where the learning location was, when learning was planned and conducted properly and seriously by maintaining its quality, it would produce good results. Produce result in the learning indicated by students-centered learning wh3 can empower students intelelectual ability. In knowledge age, 21st century, students-centered learning is required to have high quality human resources with high intellectual ability. It requires solution which can critical thinking and problem solving, tools for working, in the real living in the world (BNSP, 2010; Frydenberg and Andone, 2011).

Students' Learning Activities in Reflection

Reflection activity was conducted after observation during learning. Postgraduate student observers provided their findings and suggestions during their observations. Reflection activities included observing, suggesting findings, responding, providing suggestions, and reflecting. Data of the learning activities in SEE (reflection) can is in Table 3.

Table 3. Percentage of Students Learning Activities in SEE (reflection) of Lesson Study

Activities	Amount	
	Participants	Percentage (%)
Observing	18	100
Reporting findings	17	94.44
Responding	14	77.78
Providing suggestions	18	100.00
Reflecting	15	83.33
Average		91.11

The average of reflection activity was 91.11% (very high) from total student participants. The activities of observers referred to understand the learning reflection. When the lecturer model delivered the results of reflection, all participants in reflection activity followed carefully. After that, participants were provided opportunities to present their observation results, then a floor for responses to the learning results was held. The participants then gave suggestions to the model lecturer for the next learning. Through this reflection, collaboration occurred in the lesson study team to solve problems during open lesson. Similarly, Yamaji (2016) stated that with the collaborative reflection, the learning could support participating structure in which students learned collaboratively.

In this reflection, participants did not criticize model lecturer, but focused to present results of learning during open lesson. Observers focused on students with learning difficulties and other students' learning behaviors (Parmin, 2007; Kemdiknas, 2012). The results of reflection would become considerations to conduct next learning.

In conducting lesson study, teachers collaboratively: 1) learn curriculum and formulate learning lesson and the development objectives of their learners (to develop their life skill), 2) plan learning to obtain the objectives, 3) conduct and observe a research lesson, and 4) do reflection to discuss the next learning (Lewis et. al., 2006 in Susilo et. al., 2009). A learning, conducted in a lesson study for learning community (LSLC), emphasizes a collaborative learning where students are together mutually assisting and scrutinizing to listen ideas and concepts between them in a collaborative group (Saito et. al., 2015). The collaborative learning is the core of learning community. Similarly, Inprasitha Inprashita (2014) state that there are 5 steps of the lesson study process: 1) the teachers in the lesson study group, collaborate in developing the knowledge management plan, 2) the usage of knowledge management plan and classroom observation, 3) the classroom reflection, 4) the conclusions of teachers' learning, 5) the modification of knowledge management plan. To implement lesson study the teacher can conducting contextual learning in outside classroom would be able to improve students' learning activities, as well as learning in learning forest prototype.

The contextual learning has seven main components: (1) *constructivism* – students are able to construct understanding along with learning experiences has been done and to give a meaning through real experiences; (2) *inquiry* – students are able to self-finding concepts, facts, and principles in daily life; (3) *questioning* – students question to encourage understanding to explore and to master; (4) *learning community* – to obtain perfect understanding, students learn in groups to build learning society; (5) *modelling* – to ease understanding assimilation, students make reproducible and developable modelling in the learning; (6) *reflection* – students reflect what has been done for contemplation and take the meaning and to use it to construct understanding in the future; and (7) *authentic assessment* – assessment of all of the learning processes have been done and this is conducted by assessing the true process sequences from the beginning to the end (Muhfahroyin, 2007; Johnson, 2009).

This research focuses on how the lesson study can be done by postgraduate students as a mean for lesson study implementation training. The postgraduate students are commonly teachers coming from some regions, and they will disseminate the practice of lesson study in their respective region to build learning community and improve learning quality.

CONCLUSIONS

Based on the research results, it is concluded that students were able to implement planning, open lesson, and reflection properly. The average of total of learning activity was 91.11% from all postgraduate students with averages of activities for planning, open lesson, and reflection were 88.89%, 93.33%, and 91.11% respectively. This lesson study implementation was planned properly and implemented to biology learning innovation subject. The lesson study implementation is recommended to be applied to other relevant subjects to increase students learning activities in the forest-prototype based learning.

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