The ability of biology teachers to manage a classroom based on Lesson Study learning model

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Abstract. Lesson study is a model of teacher professional development through the study of learning and capacity building of knowledge. This study aimed to determine the ability of a biology teacher at SMAN 1 Meureudu in implementing a lesson study in the classroom. The experiment was conducted from July to September 2015. The Data was obtained through the observation sheet of the learning process, including six indicators of introduction activity aspect, 28 indicators of core activities aspect, and four indicators of the final activity aspect. Learning management was carried out in three stages of lesson study. The results of the first stage of open and post activities were went less well with an average score of 2.33 and 2.25 respectively. An Improvement was being exposed at the introduction aspect during the second stage of the open lesson with an average score of 2.83 (good category). Then, the post-lesson aspect also improved at the third stage of open lesson with an average score of 3.0 (good category). It is concluded that the ability of the biology teacher at SMA Negeri 1 Meureudu to manage classroom had improved after the third stage of the open lesson implementation with good category (average score 2.88).

1. Introduction
The development of science and technology continues to progress rapidly and create an increasingly competitive life. One attempt to address the growing science and technology is through a learning process in schools. The learning process at schools involves eight elements interlinked with each other including the competence of graduates, the curriculum, the learning process, educators and education personnel, management, infrastructure and facilities, financing and assessment [1]. In Article 19 paragraph 1 of Government Regulation No. 32 the Year 2013 on National Education Standards, teachers are directed to develop interactive learning, inspiring, fun and accommodate the students to play an active role in learning. They are also required to have and understand four competencies, as stated in Law No. 14 the Year 2005 on teachers and lecturers [2]. The fourth competencies are pedagogical, personality, professional, and social.

The Regulation of National Ministry of Education (Permendiknas), No. 16 of 2007 on the academic qualification standard and teacher competency, stated that teachers should able to develop and conduct the educational learning plan in the classroom, in the laboratory and at the field [3]. In line with the Permendiknas, teachers are expected to have activities to manage the learning as well as the possibility to create favourable conditions. As a consequence, students can learn well and actively engage in activities that are purposely planned and facilitated by the teacher.
Although based on research by [4] found that the majority of Acehnese teachers stated all biology topics required by the curriculum 2013 are essential and have been taught using various teaching strategies. In fact, through classroom observations, some teachers have lack ability in classroom management. It was identified by a lack of planning in preparing learning devices, so the planning to give learning activities that are meaningful and useful for students did not succeed. By conducting a lesson study, the situation can be rectified and provide meaningful learning for students [5].

Lesson study is a model of teacher professional development through the research of learning and the development of knowledge capacities [6]. Teachers form a collaboration group to plan to learn that will be implemented (plan), taught and observed (do), and analysed (see). Learning management through the implementation of lesson study could increase motivation and student learning, and foster communication skills on students [7] [8] [9]. Besides, by implementing a lesson study, the pedagogical competence and professionalism of teachers as educators have also improved [5] [9].

Therefore, by referring to several studies about the implementation of lesson study and by looking at the current situation of teaching and learning process at Pidie Jaya district, efforts are needed to motivate learning processes such as increasing students’ interest by tailoring the material per the level of experience, capabilities and characteristics of learners. Also, Biology teachers are necessary to share experiences and knowledge among them. Based on this background, it encourages researchers to investigate the abilities of biology teachers in implementing the classroom by the learning media that have been designed through the lesson study in SMA Negeri 1 Meureudu.

2. Method
This research was conducted at SMA Negeri 1 Meureudu, Pidie Jaya district, starting June to July 2019. The assessment used in this study were (1) the instrument of learning plan, used to assess learning media developed in “plan” stage, (2) the instrument of learning implementation that was used to evaluate the application of learning at the “do” stage which focus on the use of learning media that has been developed in plan stage, and (3) the observation instrument that was used to observe activities during the “see” stage.

This study used a quantitative approach. Descriptive statistic was used to analyse the data collected from the field. The type of this research is field research that collected data from a population that is found relatively distributed in the relationship between variables. The subject of this study consisted of a model teacher, observer (observer), and users (students).

This study began with learning to manage. The learning management was done in several stages. In practice, lesson study activities are performed in three phases, namely: the stages of planning (plan), implementation (do), and reflecting (see). The three stages are explained as follows:

- The stage of Planning (Plan): the activity undertaken at this stage was the development of a lesson plan (RPP) in lesson study group based on biology teachers meeting (MGMP) in Pidie Jaya district.
- The stage of Implementation (Do): At this stage, the model teacher was applying the learning media that has been developed at the earliest stage. While researchers, teachers, principals and the magister students of the biology education were doing observations.
- The stage of Reflection (See)
  - At this stage, the observers were assessing the results of learning design models used by teachers. They were also observing the learning process carried out by the model teacher. Next, the observers would assess the learning process carried out by a model teacher according to the “role model” designed previously.
  - Teacher as the model would do reflection by conducting a discussion with the observers about her/his performances relating to the learning activities in the classroom. Through this discussion, the observer would provide feedback to improve learning media.

The study was conducted with the involvement of the students as the user of the product, which was intended to assess the significance of the learning media for improvement purposes. The lesson study cycle is shown in Figure 1.
Parameters to be observed in this study were the level of teaching capabilities of professionally based lesson plans that have been designed at this stage in the discussion group plan lesson study. The ability of teachers to manage to learn was gathered from two observers. Observers gave checkmarks (√) on rows and columns for all aspects observed. Criterion scores of teachers’ managing abilities consist of four criteria, namely: Poor (1), fair (2), good (3), very good (4).

Thus, the data were analyzed with descriptive analysis. To obtain the data on the teacher's ability to manage the classroom, the calculation of the average score of every aspect of from 3 meetings was done. The average score is determined by the following category:

- $0.00 \leq x <1.50$ : Poor
- $1.50 \leq x <2.50$ : Fair
- $2.50 \leq x <3.50$ : Good
- $3.50 \leq x \leq 4.00$ : Very good

$x$ is the average teacher's ability to manage to learn. Learning management is effective if the teacher's ability to manage to learn is in the criterion of good or very good.

3. Results and Discussion

3.1. Implementation of Lesson Study

The chronologically descriptive result of the implementation of the Lesson Study is described below.

3.1.1. Teaching preparation (plan)

This event was held on Mei 2019 at SMAN 1 Meureudu Pidie Jaya. Seventeen participants attended to the workshop preparation included the member of MGMP biology group in Pidie Jaya district and four college professors from the Department of Biology Education FKIP Unsyiah. In this preparation activity, the teachers, together with the workshop participants plan learning that could encourage students to be active, creative, and challenging. Based on mutual agreement and compatibility to the
curriculum materials that are implementing, the teaching materials chosen for this lesson study were the diversity of species of animals and plants, regional distribution of biomes in Indonesia and the diversity of living things. Moreover, the indicators for those topics are expected to: (1) define biodiversity, (2) distinguish the diversity level from genes to ecosystem and their examples, (3) determine the distribution of flora in Indonesia, (4) determine the distribution of fauna in Indonesia based on the line of Wallace and Weber, (5) find the unique biome areas in Indonesia, (6) connect the benefits of biodiversity in everyday life, and (7) compare the system of classification of living things, taxonomy, and binomial classification.

Learning steps planned were as follows: (1) the students were divided into five groups, (2) teacher gave direction to the students in implementing the task group, (3) Teacher wrote the material that would be discussed, (4) students conducted discussion in the group, (5) each group presented the results, (6) the teacher guided/ conformed any misconceptions, (7) teacher and students drew conclusion of the concepts learned, (8) Then, teachers conducted posttest to assess students understanding of the concept that has been learned.

3.1.2. Implementation of Learning (do)
The open lesson (lesson study) was held on May 7th, May 14th, and August 31st, 2019, in the class X IPAS. The teacher started learning plan by checking the attendance of students, continued by giving apperception, conveyed the essential materials and conducted a group discussion. By the time the student began the classes, they have been conditioned to their respective groups. During the lesson, the discussion group run less productive because there were only two groups that are actively discussed. Three other groups are less collaborative which were seen by their interactions among members of the group. There were only one- or two-members groups that were pointed out as the teacher’s referral. This condition results in not all members of the group were able to explain the outcome of the discussion to the other groups.

After completing discussions in the group, then students were given the opportunity to present the results. Some students from the groups were actively volunteering to do the presentation while others should have designated by the model teacher. At the end of the learning process, the teacher asked them to draw conclusions from the discussions. The teacher model did not lead students to work on the problem questions either individually or in the group as it was supposed to be. So, there was no evaluation of the learning process on that day.

3.1.3. Reflections on post-learning (see)
Reflection activity performed after the learning implementation was done. The reflection included summarising some feedbacks or observers’ opinions during their observation of the learning process in the classroom. According to the model teacher, the implementation of the study has been conducted according to the lesson plan developed, yet during the learning process, students faced an obstacle in presenting their discussion result because they had less focus on the teaching material given. Students were also having a problem in doing the discussion due to the limitation of available resources to learn at school, and the unavailability of global internet access at the school.

The observers also provided some arguments to this reflection session. According to observers, the overall implementation of learning was good, but the rules and the allocation of time for group discussion must have been established before the class discussion conducted. They also commented that the model teacher should have provided clear instruction on the student’s worksheet and precise information regarding the schoolyard location and area division for the observation on the earliest meeting. One observer also provided opinions about inappropriate time allocation for each stage during the implementation of those contained in the lesson plan designed. He/she also stated that students were less active and less communicative which indicated that the discussion process was not optimal because students were busy with their activities. The weakness of the learning process had also shown by delicate group collaboration, less alive and less spirited.
The learning process required the model teacher to be more patient giving opportunity to students to explore their thinking. Yet, the students did not show any enthusiasms during the learning process which were shown by no further discussion after the group presentation, neither any debates (pros and cons between groups) related to the materials presented. Artika & Saputri [10] had found the same case that even though the students have been given enough “waiting time” to elaborate their thinking, there was no strong response during the class discussion. This result might also indicate that students were not able either to think critically or to express their opinion scientifically. This discussion method did not indicate the development of a positive mindset.

3.2. The Monitoring of Implementation of Learning (do)

This activity involved observer teachers rather than a group of teachers of the MGMP of Pidie Jaya district. Monitoring to the learning process carried out by the model teacher was done through the observation towards several aspects of classroom management ability. Those aspects included opening, core, and closing activities. The preliminary activity (class opening section) covered the apperception and motivation, while the core activities included the mastery of learning materials, the application of learning strategies, the application of scientific approaches, the use of learning resources/media in learning, and the involvement of students in learning. In addition, the closing activity action included concluding the topic learned. The complete results of learning monitoring are presented in Figure 2.

![Figure 2](image)

**Figure 2.** The ability of teachers to manage classroom learning

The first meeting of the open lesson showed that the teacher's ability to manage learning was not taking place as it was planned at the planning activity (plan) stage, even though the model teacher had been trying to implement the learning process aligned to the lesson plan designed. Based on figure 2, the weak managing ability at the first meeting has shown at the opening session with an average score of 2.33 (less good). This low score was caused by the inability of the teacher model to ask challenging questions and to convey the benefits obtained by the students after participating in this learning model. At the closing, the weakness laid in the learning management aspects of the provision of written and oral tests or following-up activity after the ongoing learning process. Teachers model did not give the test after the learning process took place even though the model teacher learned that a test is a reflection on seeing students’ ability to receive and understand the course materials studied. The model teacher also did not lead students to further activities and did not assign any homework as enrichment. Thus the average score for the post-lesson is 2.25 which is categorized as fair.
Furthermore, the improvements began to look at the second meeting activities (second open lesson). The average score of the introduction activities increased to 2.83 (good category), while the cover remained in the category of fair. The significant improvement was shown by the closing aspect as the result of the reflection (see) activity which was indicated by observer respond to the learning process in the classroom. The feedback and input were provided for all aspects observed during the learning process, yet the managing score for the closing aspect did not improve until the third open lesson that is shown by good category.

4. Conclusions
Based on the result, the ability of biology teachers to manage classroom learning based on lesson study in SMA Negeri 1 Meureudu is categorized in a good category.

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