

The Development of Learning Task Through Students' Feedback *A Process of Lesson Plan by Lesson Study*

Marheny Lukitasari¹ and Rusdi Hasan²

¹*Department Pendidikan Biologi, FKIP, UNIPMA, Jl Setia Budi 85 Madiun, Indonesia*

²*Department Pendidikan Biologi, FKIP, Universitas Muhammadiyah Bengkulu, Jl Bali, Kota Bengkulu, Indonesia*
marheny@unipma.ac.id

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Abstract: The purpose of this research is to describe the development of learning task based on students' response in lesson study activity. The arrangement of lesson plan as the steps of lesson study needs creativity and brainstorming through learning community. This research is implemented in Cell Biology course with four times lesson study activities. This research uses descriptive qualitative method. Observations, interviews and student responses to the learning task are treated as feedbacks that describe the quality of it that have been compiled in the lesson plan. There are four findings in this study i.e. 1) variation of learning task more diverse, 2) students learning community was formed through discussion activities, 3) the average time spent by students in completing the learning task are varied 4) students achieve better understanding in regard of material. We conclude that student response can be used as consideration in developing and improving the quality of learning task.

1 INTRODUCTION

Learning task arrangement is an important part of lesson planning activity. In lesson study activity, lesson planning is done in collaboration among lecturers in the same subject matter. Each individual will involve and deliver their ideas to develop the learning task in detail (Förtsch et al., 2017). Thus, developing lesson planning is an important activity, which encourages communication as well as identifying problem and possible solution in learning through considering students' response in doing the assignment given as an important part of learning to develop students' activeness during the learning process (Rumapea et al., 2017). Therefore, the arrangement of assignment type is a very important part of lesson planning. In arranging the assignment, the students must consider the material content, time estimation needed by the students to complete the task, type of assignment and the possible solution as well as the difficulty level (Fujii, 2016). The type of assignment is very potential in developing the students' thinking concept, helping the understanding, as well as building students' communication through discussion during the task completion process.

More effort has been made to support the improvement of the quality of material learning such as variations of models, methods, and approaches to learning (Alshwaikh and Adler, 2017; Fujii, 2016; Hsiao, 2017). However, the preparation stage of lesson plan and the way to connect students to one another during learning process play important role as the key aspect to improve student comprehension (Ansawi and Pang, 2017). The quality of tasks that are designed in the lesson plan and are conducted in the course play an important role in that the effort. The tasks in detail context involving type, form, variation and so forth are important parts of learning plan so that capable to build student understanding properly.

Learning task as a good assignment that can improve students' understanding is an interesting issue to be discussed. The important thing is due to the quality tests capable to improve students' understanding through a quality learning process. Some studies show that task forms are an important part of lesson plan (Yildiz and Karabiyik, 2012), by lesson study. Designing a qualified lesson plan can increase students' understanding of the material and also makes teachers more capable to understand, select, modify, and apply tasks that are cognitively demanding in learning process (Roelle and Berthold, 2017). Lesson study activities involve teacher

collaboration in preparing a learning plan, implementing learning practice, observing learning process, reflecting learning process and analysing its impact on learners, revising and organizing appropriate learning, as well as share findings in the learning process can improve understanding and teaching techniques of teachers. The mistakes made by the teacher to be a reflection and evaluation to make better further learning (Förtsch et al., 2017).

Preparation activity of tasks in the lesson plan is necessary conducted collaboratively through the process of discussion and sharing opinion (Bruce, Flynn, and Bennett, 2016). Designing step of the learning task in the lesson plan is a critical process in generating better learning plans and lessons (Förtsch et al., 2017). However, the learning tasks are prepared in the lesson plan do not guarantee its suitability or quality according to the characteristics of the learners when applied during learning process in the classroom. Therefore, feedback or input from students to the questions of the given learning task can be a benchmark of developing the learning task.

2 METHODS

This is descriptive qualitative research that is conducted to get the description of the learning plan preparation, especially learning task preparation that implemented through lesson study. The sample was take through purposive sampling with 37 students of third semester and 39 students of fifth semester who took biology cell subject. Data were obtained through observation, documentation, and interview to the students during the implementation of learning with four cycles.

Four indicators were used to determine the quality of learning tasks. They are 1) the variation of learning task based on level of difficulty, 2) the ability of learning task to encourage learning community in discussion, 3) the duration is needed to complete learning task, and 4) the percentage of student who answer correctly according to his thinking skill about the material of the learning task[11].

The preparation activity of learning plans for four times of lesson plan focused especially on the preparation of learning task with multiple difficulty levels that objected to connect students each other while studying Cell Biology. In this process, the lecturer model presented the learning plan is prepared independently to be discussed during the plan to the lecturer team. There are six lesson plans in which in every plan belong to three materials that will be discussed. Each material will be conducted in to lectures. The material compiled by learning task are

1) structure and function of cell membrane 2) cell membrane permeability, 3) mitochondria (distribution and morphology), and 4) mitochondria (transport and function).

The learning task are designed with concern to the four indicators above consisted of three questions for each lecture. Therefore, there are sixteen tasks of difficulty levels for total four meetings. When the lesson was unfolded, students read, discussed and analyzed the materials related to cell membrane and mitochondria using the books is written in Indonesian and related articles written either in Indonesian or English. Indonesian article was prepared as an enrichment content of cell membrane permeability material. It was given after students studied the theory of cell membranes based on textbooks at previous meetings. Similarly, for the learning task given as a means of a discussion on the mitochondrial material. However in this part, the article was in English.

3 RESULTS AND DISCUSSION

The finding were recorded through lesson plan, class discourse and student feedback reveal the quality of learning task and their role in directing collaborative learning either among student or among lecturer

3.1 Variation of Learning Task based on Level of Difficulty

Lecturer and team collaboratively designed and arranged learning task (LT) by considering variation in level of difficulty. The tasks were designed for four lecture materials listed in Table 1 below.

Table 1: Variation of Learning Task (LT) form and difficulty level.

Material 1 (Plan 1)	Difficulty level	Material 2 (Plan 2)	Difficulty level
(LT 1-1)	C2	(LT 2-1)	C3
(LT 1-2)	C2	(LT 2-2)	C1
(LT 1-3)	C4	(LT 2-3)	C4
(LT 1-4)	C5	(LT 2-4)	C5
Material 3 (Plan 3)		Material 4 (Plan 4)	
(LT 3-1)	C2	(LT 4-1)	C2
(LT 3-2)	C2	(LT 4-2)	C4
(LT 3-3)	C4	(LT 4-3)	C4
(LT 3-4)	C5	(LT 4-4)	C5

Table 1 above shows the variation in the difficulty level of the learning task given. Lesson plan created four learning tasks designed for each lecture. It was

applied either individually or in group of students. Learning tasks number 1 – 4 different complexities and characteristics with tiered difficulty characteristics as well. The importance of variation of tasks such as complexity that refers to the creativity of the task form so that in the learning activities will build the concept of students (Roelle and Berthold, 2017). In creating tasks, lecturers encountered difficulty, as there were differences in their concept related to Cell Biology materials that are discussed and the strategy to deliver it in discourse. However, the difference of opinion raises their viewpoint as well as collegiality. In turn, it positively increase their ability and professionalism among lecturer who attended the lesson plan activity (Fujii, 2016).

There was dynamism condition such as opinion and argumentation exchanges that enrich and strengthen the task quality in the discussion process during lesson plan especially in designing learning tasks. The variety of task forms as one of the key components, which showed that the tasks that assist the thinking process of students would have a direct impact on their learning conditions. High cognitive level task affected on conceptual knowledge of student (Förtsch et al., 2017). On the other hand showed that the discussions would improve the skills of performing task analysis as well as teacher's understanding on both planning and learning. The tasks were applied in lesson study base learning capable to increase both teacher and student learning due to the increase in frequency, emphasis and implementation of quality tasks (Bruce et al., 2016).

3.2 Ability of Learning Task to Encourage Learning Community in Discussion

Learning community detected from interviews conducted on students after following the learning process. The results of interviews between the researchers (R) and students (S) are presented as follows:

- R: Are you doing task on a discussion?
 S: Yes, we do taskwith discussion.
 R: How technical are you doing the task?
 S: After task was given, we worked individually first and after that we had a discussion

Response of the student's answer indicates that the student has a good discussion as the beginning of the formation of teach community to work on the learning task. Further deeper data digging followed by interviews with the following results:

- R: Is there a dominant student in the group while working on task?
 S: There is.

- R: What happened to the dominant student?
 S: He conveyed a possible answer based on task.
 R: Are there any students who do not express their opinions at all?
 S: There is.
 R: What did the silent student do? and how other group members react
 S: We (especially me) try to ask her opinion. Sometimes he wants to comment but often not.

The findings in the interview indicated that students possess high academic level was still dominant among other students in their group during discussion session. In this case, the role of lecturer as learning facilitator becomes very important to be able to connect between students who were conducting discussion. However, generally there was a change of student behaviour that leads to form a learning community as collaboration to resolve learning tasks in the discussion (Alshwaikh and Adler, 2017). Behaviour change through the implementation of lesson study have been reported widely in many subject of discourse (Ansawi and Pang, 2017; Lieberman, 2009; Paper, 2016; Zhou, Xu, and Martinovic, 2017). Support that the suggested to improvement of knowledge related to the content of the subject matter was a direct impact felt by the students (Angelini and Alvarez, 2017). The higher the quality of the learning task the more strongly encourages students to discuss in order to solve the problem in learning task. This directly encourages the formation of collaboration between students so that sharing and learning community activities are formed in the classroom.

3.3 Duration is Needed to Complete Learning Task

The time duration that was needed by students in resolving learning task become our concern on this study. Lecturer has set it in the lesson plan for each learning task that vary according to level of difficulty based on teachers perceive. In this area, student feedback was very important due to reflect whether level of difficulty according teacher and student is in line as shown in table 2 below.

Table 2: Average duration of time required to complete learning task.

Learning Task (LT)	Duration of time required (minutes)	Learning Task (LT)	Duration of time required (minutes)
LT 1-1	10,45	LT 3-1	12,45
LT 1-2	14,56	LT 3-2	18,50
LT 1-3	10,55	LT 3-3	30,40
LT 1-4	17,00	LT 3-4	30,25
LT 2-1	08,55	LT 4-1	15,25
LT 2-2	15,05	LT 4-2	25,15
LT 2-3	15,55	LT 4-3	28,15
LT 2-4	20,12	LT 4-4	30,22

Table 2 shows that the average duration of time required in completing learning tasks is varied between 8 to 30 minutes. Designing and adapting task (including sanction of time duration for completing task) in lesson plan is critical step in in lesson study due it determine whether the goal of lesson can be reached (Fujii, 2016). In general context, The Florida Education Association (FEA) states that it is very important to consider the duration of time in the implementation of learning because it will affect the quality. It is assumed that higher quality and level of difficulty of learning task needs more time to resolve. The result showed that level of difficulty of learning tasks mostly in line between lecturer and student perception (Julien and Daniel, 2017). There are some learning tasks with lower difficulty according to lecturer opinion in lesson plan need more time to complete by students. This finding was very valuable as feedback to design task with better quality in further discourse.

3.4 Student Feedback to the Learning Task

Results obtained from the work of learning task by students can be observed from some answers that are delivered as follows.

Response (LT 1-1): *Cell membrane is a barrier in cells that serves to protect the inside of the cell, giving the cell shape, as the way out of entry of nutrients or molecules into cells that have the permeability and barrier properties between the extra fluid cells and intra-cell.*

Student responses to (LT 1-1) are averaging an answer that tends to be correct with the sentence model according to the character of each student. These findings indicate that students have sufficiently

understood the concept of cell membranes as an important part in the mechanism and coordination between cells. The assignment produced from LT 1-1 is still in the level of knowledge. However, those task are greed to be given as it will give the basic knowledge for students to answer the next assignment. The indicator for developing the multi-difficulty level assignment is the important aspect for the students to recall the previous knowledge obtained from the previous lesson (Dunlosky et al., 2013)

Response (LT 1-2)

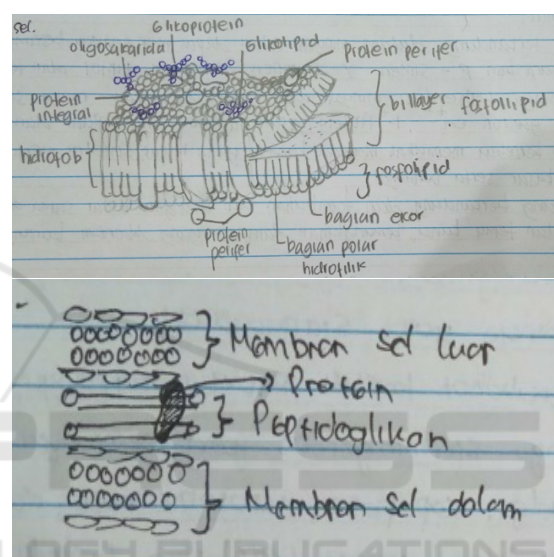


Figure 1. Different response responses to LT 1-2: Complete and correct cell membrane images with their descriptions 9 (above), and not complete imagine with the wrong perception (below).

Based on the student's response to LT 1-2 in Figure 1 shows that there are differences in the answers observed from the delivery of images and concepts that are related to the cell membrane structure. The findings indicate is capable of making the students to recall and re-confirm the material-related understanding, although still encountered an exposure error as shown in Figure 1 (below).

Response 1 (LT 3-3): *Same, because the mitochondria in the cell have the same structure and morphology and function. The shape of mitochondria may change because there is a different energy-consuming process (ATP) so that the shape also changes*

Response 2 (LT 3-3): *No, because the number of mitochondria in the cell depends on the activity of the cell. the higher the activity, the*

more energy needed so that the number of mitochondria also become more and more.

Results of the 1 and 2 responses that appear on the results of the work on LT 3-3 shows variation of the answers from the students. Response 1 shows that students understand that mitochondria are cell organelles that act as energy sources. However, due to the structure and number of mitochondria in the cell, response 1 still indicates a misconception of the concept. Response 2 shows the wrong answer but it gives the correct reason. The two responses conveyed resulted in the learning task being able to provide important thought contradictions to foster their understanding of the material. The students' responses toward the learning task show their views and understanding, so it help the lecturer to evaluate the achievement (Lieberman, 2009).

4 CONCLUSIONS

Developing learning tasks through lesson study and using student responses as feedback can be developed to improve the quality of learning tasks. Pattern of learning task becomes more varied, qualified and able to build the learning community of students in learning so that directly impact on the increase of student understanding of cell membrane permeability and mitochondria. These results indicate that lesson study gives positive contribution especially when creating of learning task in the learning plan either to the quality of learning task or to learning community between teacher and student.

REFERENCES

- Alshwaikh, J., Adler, J., 2017. *Researchers and teachers as learners in Lesson Study*, (April).
- Angelini, M. L., Álvarez, N., 2017. Spreading lesson study in pre-service teacher instruction, *International Journal for Lesson and Learning Studies*, (January).
- Ansawi, B., Pang, V., 2017. The Relationship between Professional Learning Community and Lesson Study: A Case Study in Low Performing Schools in Sabah, Malaysia, *Sains Humanika*, 9(1-3), 63-70.
- Bruce, C. D., Flynn, T. C., Bennett, S., 2016. A focus on exploratory tasks in lesson study: The Canadian "Math for Young Children" project. *ZDM-Mathematics Education*, 48(4), 541-554.
- Dunlosky, J., Rawson, K., Marsh, E., Nathan, M., Willingham, D., 2013. Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology, *Psychol Sci Public Interes Suppl.*, 4(1), 4-58.
- Förtsch, C., Werner, S., von Kotzebue, L., Neuhaus, B. J. 2017. Effects of high-complexity and high-cognitive-level instructional tasks in biology lessons on students' factual and conceptual knowledge, *Research in Science and Technological Education*, 5143(January), 1-22.
- Fujii, T., 2016. Designing and adapting tasks in lesson planning: a critical process of Lesson Study, *ZDM-Mathematics Education*, 48(4), 411-423.
- Hsiao, H.-S., 2017. A Five-Stage Prediction-Observation-Explanation Inquiry-Based Learning Model to Improve Students' Learning Performance in Science Courses, *EURASIA Journal of Mathematics, Science and Technology Education*, 13(7), 3393-3416.
- Julien, B., Daniel, M., 2017. Lesson Study ... and its effects, *Hellenic Journal of Research in Education*.
- Lieberman, J., 2009. Using Lesson Study to Develop an Appreciation of and Competence in Task Design, *Tasks in Primary Mathematics Teacher Education Purpose, Use and Exemplars*, 309, 11-24.
- Paper, C., 2016. *Lesson Study in Professional Learning Communities 2014-2016: experiences from the Netherlands*, (September), 1-17.
- Roelle, J., Berthold, K., 2017. Effects of incorporating retrieval into learning tasks: The complexity of the tasks matters, *Learning and Instruction. E*, 49, 142-156.
- Rumapea, G., Syahputra, E., Surya, E., 2017. *Application of Quantum Teaching Learning Model to Improve Student Learning Outcomes*, 4(2), 118-130.
- Yildiz, Z., Karabiyik, B., 2012. The Implementation of a Lesson Plan Which is Prepared According to the Meaningful Learning Theory and Evaluation of the Results, *Procedia - Soc Behav Sci.*, 46, 4021-4025.
- Zhou, G., Xu, J., Martinovic, D., 2017. Developing pre-service teachers' capacity in teaching science with technology through microteaching lesson study approach, *Eurasia Journal of Mathematics, Science and Technology Education*, 13(1), 85-103.