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# The Implementation of Lesson Study for Learning Community (LSLC) in Microteaching with the Guided Discovery Learning Model to Improve the Pedagogic Abilities of Prospective Teachers

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**Abstract.** Learning process as demanded by 2013 curriculum supposes to direct students to develop attitudes, skills, and knowledge. Guided Discovery Learning is one of the learning models using a scientific approach to increase the activeness of students, the pedagogic abilities of prospective teachers and improve the quality of learning. This study aims to describe the application of Lesson Study for Learning Communities in microteaching activities to improve the pedagogical abilities of prospective teachers. The type of research used is descriptive qualitative research. The instrument used is an observation questionnaire that has been validated. The subjects of this study consisted of 12 FMIPA UNP chemistry students from class A and class B who acted as model teachers. The data collection technique was carried out using the observation method using an assessment of the pedagogic ability of prospective teachers of the Padang State University Education and Training Program 2020. After the value is obtained, then the average value is taken and conclusions are drawn The results of the study indicate that after the Guided Discovery Learning model based on Lesson Study for Learning Community (LSLC) is implemented, it can improve the pedagogic skills of prospective chemistry teachers from the good to very good range. The application of GDL syntax in the conventional learning method class in class A and B obtained the highest score of 7 while the LSLC learning in class A and B obtained the highest score of 10. So that the application of lesson study for learning community (LSLC) with the GDL model is effective to improving the pedagogic abilities of prospective teacher.

## INTRODUCTION

The goal of professional development is not only to help teachers acquire knowledge and understanding for teaching but also to support them in acquiring proficiency in applying all knowledge and understanding in their classrooms [1]. It is clear that the most valuable teaching and learning occurs implicitly in the classroom [2]. Teacher professional development programs are short-term, lack innovation, outside of school training, and have a disconnect between theory and practice in the classroom [3][4][1]. Traditional classrooms, traditional teaching practices can be improved by professional development which consists of short course training focused on training to improve chemistry material [5]. However, Lesson Study as envisaged by the teaching profession in Japan and developed over 140 years ago, differ in their focus and methods of professional development. Lesson Study focuses on student learning in the classroom, hands-on class, teaching and observation, teacher learning, and school-based development [6]. Lesson study was initially used as the main method of professional development for Japanese teachers [3][7][8][9][10]. Currently lesson study is used as an important method in pre-service education for new teachers and in-service professional development for licensed teachers in Japan [11][9]. Therefore, the teaching profession that focuses on solving student problems can be developed by conducting lesson studies [5].

Lesson study provides a way for teachers to improve learning systematically [12]. Lesson study provides a process for collaborating and designing lessons and evaluating the success of teaching strategies that have been

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implemented in an effort to improve the process and student learning outcomes [13][14]. Lesson study is carried out in three stages, namely plan, do, and see which is carried out in a structured, cyclical and sustainable manner [15].

The discovery model is one of the learning models developed by Jerome Brunner. Brunner developed a discovery model based on the views of constructivism and cognitive learning theory. Brunner considers that finding knowledge through human activity will give the best results [16]. [17] Discovery learning is a method that encourages students to ask questions and draw conclusions from general practical principles. Discovery learning has three types, namely: (1) pure discovery; techniques that involve indirect assistance, other than encouragement by a teacher, (2) guided discovery; techniques that involve minimal to moderate assistance by a teacher and (3) expositional learning; involve maximum teacher assistance and usually little or no discovery from students [18].

Of the three types of discovery learning above, Kersh and Wittrock state that the guided discovery learning model is the most motivating learning model for children, because the teacher provides encouragement and support to students until students become more motivated in learning, besides that in practice students will work more focused in achieving the learning objectives that have been set because they are assisted by instructions from the teacher. Guided discovery learning is learning that trains and guides students to learn, acquire knowledge and build concepts that they find for themselves.

1. Discovery Learning Principle
   The principles of discovery learning are: (1) creating a classroom atmosphere that supports students to freely discover by conducting experiments, (2) challenging students to consider what has happened, to analyse relevance, do it and share it with others, (3) the teacher guides students to be able to analyse data and find concepts, (4) the value of the learning experience is expressed through an analysis of the experiences created and (5) the teacher creates an intellectual climate to guide learning activities in the classroom [18]. [19] The advantages that students get by learning to use guided discovery learning are: (a) Developing intellectual potential; (b) Changing students who have motivation from outside (extrinsic motivation) into motivation within themselves (intrinsic motivation); (c) Students will learn how to learn; (d) Retain memory.
2. The Steps (Syntax) of the Guided Discovery Learning Model
   The Syntax of the guided discovery learning model has 5 phases, namely: (1) motivation and problem presentation, at this stage the teacher creates a learning situation that can directing students to a discovery by giving a problem [19]. The problems presented can be done with various methods such as demonstrations, narration, question and answer, etc. so that they can motivate and inspire students, (2) Selection of learning activities, at this stage, students are assisted by teachers in choosing learning activities to solve the problems that have been presented previously, (3) data collection, in collecting data students negotiate ideas and learn on their own or learn from each other. In this process students set up the apparatus and conduct experiments if any, (4) data processing, at the data processing stage, students are involved in interpreting and analysing the data that has been collected. Students discuss the observations that have been made while the teacher asks questions to guide students in finding concepts from the material. The concepts and data that have been obtained can be in the form of graphs, analysis, or interpretation. Based on this analysis, students make a prediction and (5) closure. At the closing stage of learning, students review the content they have learned to recall their previous knowledge.

## LITERATURE REVIEW

The implementation of Lesson Studies as an effort to improve the pedagogic competence of Indonesian language teachers at the Cirebon Regency Junior High School got positive results on the pedagogic competence of teachers [20]. In the alternative strategy to increase the competence of prospective chemistry teachers with lesson study in preparing lesson plans, it reached 75.25% (good), while the competence of prospective chemistry teacher students reached an assessment percentage of 73.77% (good) [21]. In Biology Learning Activities, the management course has succeeded in equipping prospective teachers with the necessary experience before prospective teachers teach any kind of study shows that 90% of students, teachers are eager to implement lesson study-learning in any teaching [22]. The syntax of the GDL model developed by Carin (1997), Smitha have modified new syntax consisting of 5 learning phases. The phases in the guided discovery learning model are (1) motivation and problem presentation; (2) data collection (data collection); (3) data processing (data processing); (4) verification (verification); and (5) closure [23].

## RESEARCH METHODS

The research to be carried out is descriptive qualitative research, namely research procedures that produce descriptive data in the form of written or spoken words from people and observed behaviour. This type of research method is used by researchers with the intention of describing and analysing so that they can build knowledge through understanding and discovery about lesson study for learning communities with guided discovery learning models. The implementation of the research took place in two stages, which were adjusted to the time allocation and the selected subjects. Each stage consists of three activities, namely: 1) Planning (plan); 2) Implementation and Observation (do); 3) Reflection (see)[24].

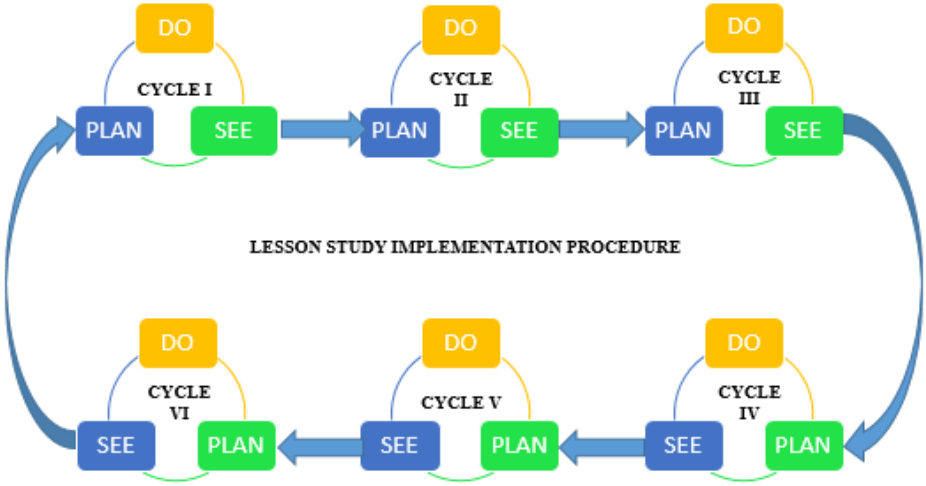



**FIGURE 1.** Stages of LSLC Implementation in Micro Teaching Courses

### Data Processing

The data collection technique was carried out using the observation method using an assessment of the pedagogic ability of prospective teachers of the Padang State University Education and Training Program 2020. The assessment was carried out by observers, several important points were assessed using the instrument, namely Preliminary Activities, Core Activities, Closing Activities and personality assessments of the candidates were also carried out. After the value is obtained, then the average value is taken and conclusions are drawn to see the increase in pedagogic competence after the implementation of Lesson Study for Learning Community.

**TABLE 1**. Category

| Rating Scale | Category |
|---|---|
| 1-2 | Very Poor |
| 3-5 | Poor |
| 6-8 | Good |
| 9-10 | Very Good |

## RESEARCH RESULT

There are 12 students who do microteaching to implement LSLC in the GDL learning model. The data obtained in the study used a qualitative data model analysis. The results of the research that has been done in two Micro

Teaching classes are divided into 2 namely conventional classes and LSLC Class. The result can be seen in Figure 2 and Figure 3.

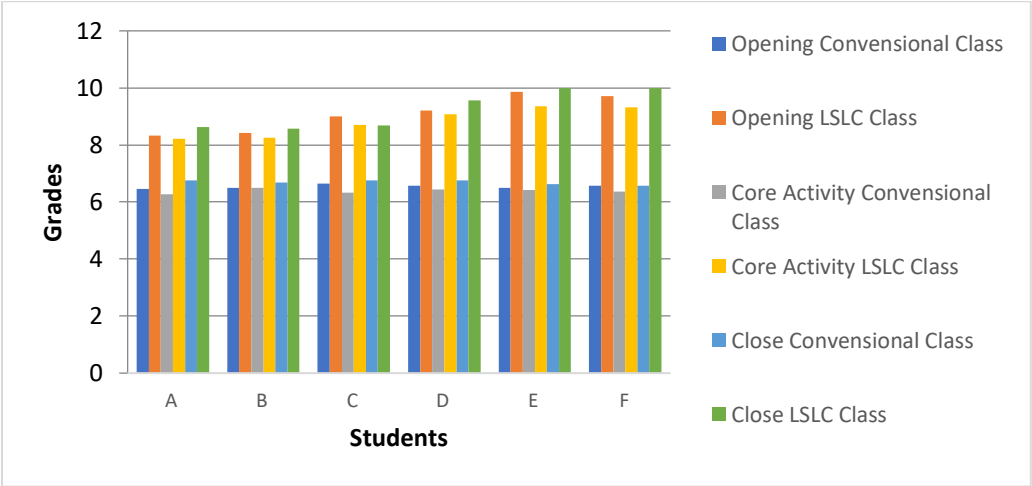



**FIGURE 2.** Improvement The Pedagogic Competence of Prospective Teachers in Conventional Classes and LSLC in Class A

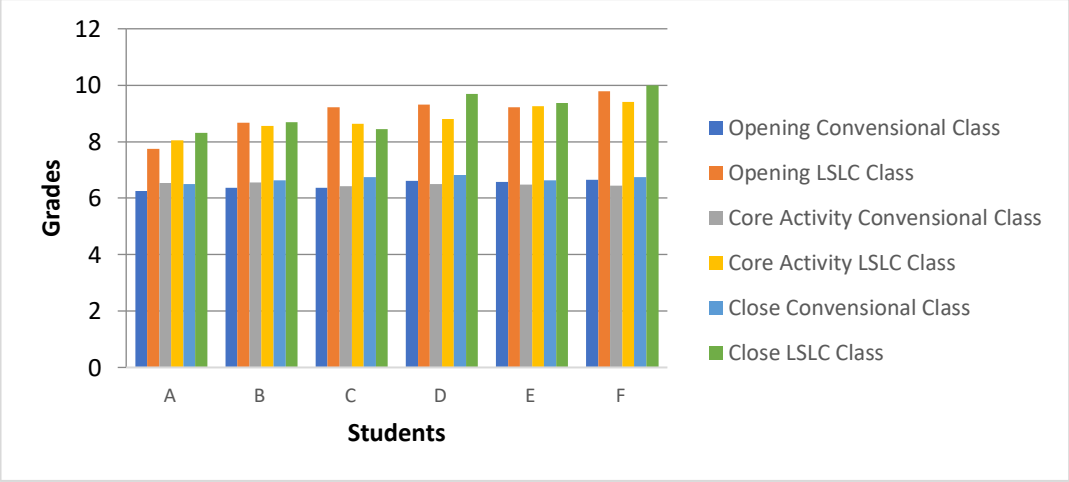


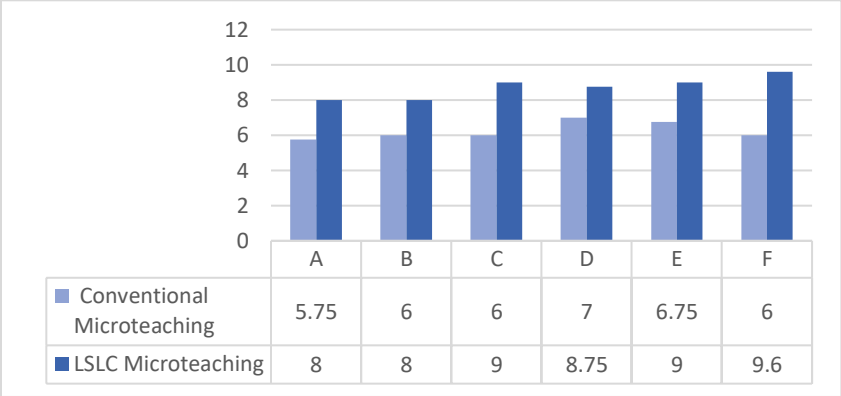

**FIGURE 3.** Improvement The Pedagogic Competence of Prospective Teachers in Conventional Classes and LSLC in Class B

Based on the table of results of LSLC research that has been carried out in Micro Teaching courses, the research was carried out in different classes, namely class A and class B. The LSLC implementation system was applied with the same method, namely applying lesson study with guided discovery learning models. The first stage consists of opening activities, core activities and closing activities carried out without applying the LSLC with the GDL model. Furthermore, Full Teaching Activities are carried out by applying LSLC with the GDL model. The Lesson Study stages that are applied to the GDL model start from the plan stage, this activity is carried out jointly by the class GDL team starting from designing chapter design, future design and lesson design.

Next is the do stage, this stage is the application of the planning results that have been discussed previously by the model teacher. While the other team members become observers of the do stage which is being carried out by one of the model teachers. Next is the see stage, at this stage a reflection is carried out by members of the GDL group, starting from asking the teacher for an impression of the new model and continuing with suggestions from group members who become observers. The results from the see stage are used as guidelines for designing teaching materials again at the plan stage for the next cycle.

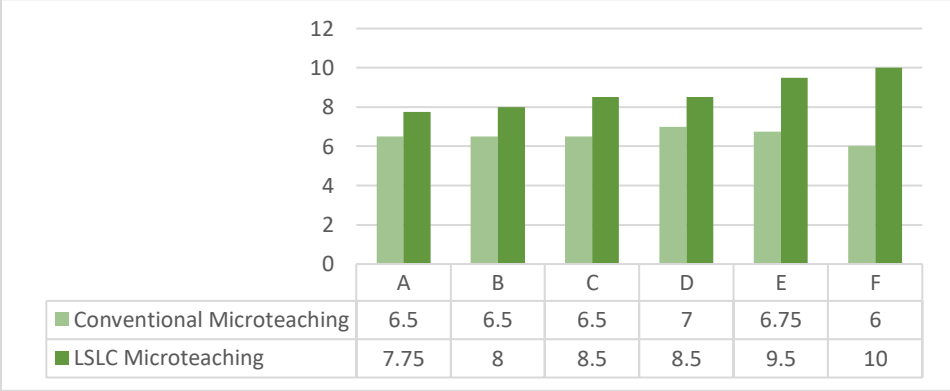
Figure 2 and 3 figure out that there was a significant increase in pedagogic values from cycle 1 to cycle 6 in classes A and B during class opening, core and closing classes. The implementation of reflection after learning or do can improve the appearance of the next model teacher at the time of learning. where in the conventional class the highest pedagogic value is in the good category while the highest pedagogic value in the LSLC class is in the very good category.

A good learning process is learning carried out by a teacher using appropriate learning methods and models for the subject matter to be delivered. The appropriate learning model has the syntax that must be done during the teaching and learning process. The GDL learning model consist of some steps that must be done by the teacher. The results of the implementation of the GDL syntax for conventional classes and LSLC classes can be seen in Figure 4 and 5.




| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Conventional Microteaching | 5.75 | 6 | 6 | 7 | 6.75 | 6 |
| LSLC Microteaching | 8 | 8 | 9 | 8.75 | 9 | 9.6 |

**FIGURE 4.** Class A GDL Syntax Implementation Data




| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Conventional Microteaching | 6.5 | 6.5 | 6.5 | 7 | 6.75 | 6 |
| LSLC Microteaching | 7.75 | 8 | 8.5 | 8.5 | 9.5 | 10 |

**FIGURE 5.** Class B GDL Syntax Implementation Data

Based on the Figure 4 and the Figure 5, it can be seen that in class A, cycle 1 to cycle 6 shows the value of the syntax application going up and down, while in the LSLC class the value of GDL syntax application has increased from cycle 1 to cycle 3, a slight decrease in the value of the application of syntax in the 4$^{th}$ cycle, in cycles 5 and 6 the value of the implementation of the syntax went up again due to reflection and improvement of plans for the next cycle, so in the 5$^{th}$ cycle the teacher of model E got a value of 9 and cycle 6 the teacher of model F got a value of 9.6. Likewise in class B, the value of applying the GDL syntax for conventional classes from cycles 1 to 6 only gets the highest score of 7 out of the highest score of 10. While in the LSLC class the value of implementing the syntax is perfect, which is 10, and the value from cycle 1 to cycle 6 has increased. The ups and downs of the value of the application of the syntax can be caused by the skills possessed by the model teacher him/herself, and also because of the plan, do and see at the lesson study stage which is carried out repeatedly. Generally, the comparison between the values of the implementation of the GDL syntax in the conventional class and the LSLC class, it looks much different. where there is a very rapid increase. It shows that the application of LSLC in the learning process can train model teachers in applying the GDL syntax well in the learning process.

Table 2 below shows there were some errors in carrying out the steps of the GDL learning model in conventional classes. The LSLC corrected these errors so that the syntax of the GDL learning model can be carried out properly over the period of LSLC. These improvements were planned at the plan stage, carried out at the do stage and reflected for the next improvement plan.

**TABLE 2.** Comparison of Conventional Classes and LSLC Classes Using the GDL Learning Model

| Stage | Conventional Microteaching | LSLC Microteaching |
|---|---|---|
| *Motivation and problem presentation* (motivation and problem delivery) | Problem presentation is not right<br>• Students are led and stimulated to think why from 2 glasses of orange juice and 2 glasses of soap there is one of the best options<br>• Probing questions "From the two pairs of examples that you showed, why are they similar but not the same?" | Problem statement fixed<br>• Students are guided and stimulated to think about the differences and similarities of the 2 glasses of orange juice and 2 glasses of soap.<br>• Probing questions "From the two pairs of examples that you showed, why are they similar but not the same?" |
| *Data collection* | • The teacher explains that the questions are expected to guide students to find concepts in discussion<br>• Each group collects data related to the problems raised in the worksheet assisted by references, | do the same thing with conventional class |
| *Data processing* | There is no data processing stage | Make changes to the data processing stage |
| *Verification* | There is no data verification stage | Improvements were made at the verification stage |
| *Closure* | The model teacher does not ask students to conclude the learning material | The model teacher asks students to conclude the learning material |

## CONCLUSION

The results of the study indicate that the Lesson Study Learning Community Based Guided Discovery Learning model improve the pedagogic skills of prospective chemistry teachers from the good to very good range. The application of GDL syntax in the conventional learning method class in class A and B obtained the highest score of 7 while the LSLC learning in class A and B obtained the highest score of 10. Comparison of the implementation of the GDL syntax in the conventional and LSLC classes, it was found that there were still some errors in carrying out the GDL syntax steps in the conventional class, while in the LSLC class the errors that might occur in carrying out the syntax steps would be resolved when do see by the community and will do the plan again to prepare for the next do stage.

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