LESSON STUDY OF CONSTRUCTIVIST APPROACH MATTER THROUGH CONSTRUCTIVIST LEARNING TO CHEMISTRY EDUCATION STUDENTS OF CHEMISTRY DEPARTMENT UNIVERSITAS NEGERI SURABAYA

By: Mitarlis and Utiya Azizah
Department of Chemistry Universitas Negeri Surabaya
Email: mitarlis@unesa.ac.id

Abstract: Constructivist approach, is part of topic of Learning Theories Course that given to students of Chemistry Education study program at the Department of Chemistry, State University of Surabaya. Learning of learning theory course had been done with various methods and strategies. Include the constructivist approach matter was conducted by the constructivist learning that hold with lesson study. The activities started from plan to design constructivist learning of constructivist approach matter. The essence of planning was essential that in the introduction step had been presented phenomenon that can construct the concept of constructivist approach to the student. And then implemented in the open lesson (do) that done twice and reflection (see) also performed twice. The results of the first open lesson reflection was used as references to re-plan learning design on the implementation to second open lesson. The results of this lesson study can be concluded that the constructivist approach matter of learning theories course which presented by using constructivist learning can be create student learning activities during the learning process since start to finish of the lesson; the interesting pattern of student interaction was found as a reference for design next or other lesson, and class management can be used as a reference for other learning in the other matter or other subjects.

Keywords: Constructivist Approach, Constructivist Learning, Lesson Study

1. INTRODUCTION

Education and learning develop rapidly in accordance to the demands of changing era. Experts always make improvements to the learning with learning innovation. Various attempts were made, among others through action research, study of learning or teaching and learning or lesson study. Study of learning with lesson study can be done at all levels, from elementary school to university. Implementation of lesson study in college to do with learning study courses.

Learning Theory courses is one of the subjects that must be programmed by students of Chemical Education study program in the Department of Chemistry, Universitas Negeri Surabaya. Description Learning Theory courses listed in Semester Lesson Plan year 2015 are: The study of the principles and the way students learn by studying the theory of behavioral, social learning theory, cognitive learning theory, constructivist approach, as well as motivating students to learn; and its application in the analysis of learning through case examples in class. The formula of learning outcome are; 1) Utilizing a source of learning and ICT-based learning media to support the implementation of learning by applying specific learning theory; 2) Comprehend theories of learning and able to apply in learning; 3) Make a decision based on the analysis of case studies of classroom learning and give ideas to choose various alternative solutions; 4) Have a responsible attitude by applying appropriate learning relevant learning theory.

To achieve the learning outcomes that have been formulated, the matter of study materials are covered in course descriptions and broken downed into details of the study materials. Material about Constructivist learning covered, 1) Revolution constructivist education and an overview of the basic principles of constructivist, 2) description of how to teach cooperative learning, 3) description of how to teach problem-solving and critical thinking, requires the study of how the presentation that the students animate material Learning is about constructivist.
Form of lectures conducted by the lecturers team of Learning Theory course is to use various models of learning with lectures, demonstrations, discussions and role playing, which is adapted to the characteristics of materials or concepts in Learning Theory course.

At the time of teaching, the lecturer explained based on Semester Lesson Plan (Rencana Pembelajaran Semester / RPS) and the evaluation grid that has been developed jointly by a team of lecturers of Learning Theory course. Implementation of the learning process are not yet using Class Implementation Plan in detail, just based on the outline contained in RPS.

Therefore it is necessary for the implementation of Lesson Study to assess learning course material in particular learning theory constructivist approach through constructivist learning. Lesson study has been developed in Japan and widely adopted by other countries such as in Indonesia. Lesson Study is a model professional guidance for educators through the study and a sustainable collaborative learning based on the principles of collegiality and mutual learning to build a learning community. Through Lesson Study based courses are expected to be known how effective and efficient a learning activity.

Lesson study is a sustainable and collaborative process of study of learning activities based on the principles of collegiality and mutual learning to build a learning community (Syamsuri I. and Ibrahim, 2011). With regard to the activities of the Lesson Study, according Mulyana (2007) has three stages, namely 1) Planning (Plan), 2) Implementation (Do) and 3) Reflection (See). At this activity on stage of the Plan, the lecturers of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning. Planning begins with activities of need assessment and problems that faced in learning, so that can know the real conditions that will be used for learning. Hereinafter together also sought completion of the problems identified, so that the lesson plan is a plan that is really better, in which can anticipate all possibilities that will occur during the implementation of learning, from the preliminary stage, the core stage and the end of the lesson.

At the stage Do, there are two main activities, namely: 1) the implementation of learning undertaken by lecturers models that have been agreed or mutual consent to practicelesson plan 1 which has already been agreed and 2) observation by observer as members of lecturers team of learning theory subjects or another community. The purpose of observation at the implementation stage include: investigate the activity of students in the form of student interaction between students and other students, students and teaching materials, students and lecturer or students and the media during the learning takes place, as well as setting of seating. The third stage is the See (reflection), which discussed the results of a reflection on inputs from observers as a provision in order to improve the next learning process. This activity is performed discussion that starts from the delivery of impressions lecturers models, subsequent delivery of responses and suggestions are supported by evidence from observations of the observers and not of opinion. Results of reflection can be used as feedback to all participants for the benefit of the repair or improvement of the learning process next.

Based on the description of the background of the problem in this activity are:
1. How does the study of learning about constructivist learning model STAD cooperative based constructivist through lesson study?
2. How is the implementation of lesson study by conducting open lesson on learning theory courses start from planning, implementation, and reflection and improvement

The aim of the activities of implementing Lesson Study this time particularly in the Learning Theory course especially on material constructivist approach is as follows:
1. Describing the study of learning process of student centered leaning and constructivist approach materials through a constructivist learning.
2. Implementation of lesson study by conducting open lesson on learning theory courses, from planning, implementation, reflection and improvement
2. METHOD

Activity Lesson Study on Learning Theory courses through the following stages:

1. Stage Plan, lecturer model or the learning conducer prepare lesson plan that was created together with the team of lecturers Learning Theory, by analyzing the needs and concerns of students sharply, start from basic competence, how to make students learn, anticipate the lack of facilities and means of learning and so forth. Preparation of the lesson plan can also be done by a lecturer model independently and later discussed with the team, so that the resulting lesson plan better than by herself.

2. Stage Do, for implement lesson plan that were prepared in stage plan, was hold open lesson together, there were observers colleagues or cognate to know the feasibility of learning.

3. Stage See, reflect on learning activities that have been performed at open lesson to obtain useful input for the improvement the next teaching and learning process.

Efforts presentation constructivist learning materials that students animates the material being studied is about constructivist in this activity was done with constructivist based learning by using STAD cooperative learning model. It is hoped can be more meaningful learning for students.

3. RESULT AND DISCUSSION

On the implementation of this lesson study activities, lecturers team of Learning Theory course can’t be involved all. They can’t join at the stage of plan, do, or see due to various causes, among others; along with a schedule of teaching in other subjects, schedule testing proposal or thesis, or other activities. Nevertheless lesson study activities can still be carried out with twice the open lesson by two members of team lecturers only. The result of the lesson study activities can be described below.

Planning (Plan),

At this stage of the Plan, the lecturers team of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning. Planning begins with activities of need assessment and problems faced in learning, like:

- Materials: The learning materials of student centered and constructivist learning required to learn with constructivist learning examples that students can animate with a direct view examples of teaching practice.
- Instructional Media
- Student Worksheet
- Problems: How to organize learning constructivist materials with constructivist learning; What the model of learning was used in a constructivist learning materials, How to design a constructivist learning materials.
- Students: Students of Education Chemistry class A year 2015 (36 students)

Team:
- Model Lecturer: Dr. Utiya Azizah, M.Pd.
- Observer: Mitarlis, Pd., M.Si.
- Documentation: Mitarlis, S.Pd., M.Si.

Constructivist-based learning model that can be used include cooperative learning model. In this activities the model was used STAD (Student Team Achievement Division), cooperative learning. With STAD cooperative learning-based constructivist, students are expected to construct their own knowledge about the constructivist approach. The activity on plan stage shown on Figure 1.
Activity of plan 1 was generated learning materials that consists of a lesson plan that will be implemented in stages DO. Student Worksheet that were completed with Hand Out was available.

**Doing open lesson 1 (20 April 2016)**

At the Do stage, there were two main activities, namely: 1) Implementation of learning based on lesson plans that have been prepared together (learning designed using STAD cooperative learning model) student-centered learning materials and constructivist. 2) Observations by team members lecturers of Learning Theory course or from another team course. Leaning Theory course in this activity was programmed by the students of Chemistry Education program year 2015 class A (36 students). The student divided into 9 groups. Observers observe student activities in group or class.

**Student activities in group**

One example of the observation result presented on Figure 2.

Figure 2 shown that members of 4 students in one group split into two groups. Each student discussion in pairs. (A) Group 5 and (B) Group 2 are divided into two groups.

Another students activities on learning process of constructivist approach by using constructivist learning in a group presented on Figure 3. There are many activities like discussion between students in a group or new group, doing worksheet together, or reading the literature from hand out or another resource like gadget.

Figure 3 (A) students doing worksheet together, or (B) individually, (C) student reading other the literature from website by using gadget.
Interaction Sudent with media and their work result

The result of student work in this activities shown different type, there were summary on thier book, worksheet, or highlight on their hand out.

![Interaction Sudent with media and their work result](image)

(A) Student make summary on their note,  
(B) Student do the task on their worksheet and re-check their answer  
(C) Student make highlight on their handbook

Reflection open lesson 1 (21 April 2016)

From the observation and reflection, not all worksheet filled by each student in the group. Almost all groups just filling the worksheet completely which will be collected and presented. While others worksheet only partially filled grain task. Methods of student work in cooperative groups is to share the task of working on particular points. After that they share their answers to complete one worksheet on each task item.

From the result of reflection can provide input that in a group consisting of four people quite given two worksheets, one as an archive and one for collected each group filled completely. Students can work cooperatively in groups. Completed worksheet presented in Figure 5.

![Reflection open lesson 1](image)

Figur 5. One page of completed workssheet

The third stage is the See (reflection), namely the learning process improvement efforts. This activity is performed discussion that starts from the delivery of impressions lecturer organizers (Lecturer Model) open lesson.

a. Impressions Model Lecturer:

During this lecture is given with explanations / lectures, efforts to enable students to frequently asked questions and discussed using a STAD cooperative model implemented aims to enable the students. Model lecturer describes the enforceability of learning by design have made in the lesson plan 1.
Lecturer models reveal the impression of the implementation of learning particularly about enforceability constructivist learning through the presentation of the pictures and learning interactions and students were asked to look. Thus students can construct their knowledge about constructivist approach through constructivist learning.

Reflections from an observer on the implementation of the open learning lesson 1.

Observers describe the activity of students during learning, there are on the record, given a highlighter, etc. Observers reflect student learning activities (Group 1) and Group 5 the division of the group again inadvertently. Based on observations of the observer looks conformity with the impressions conveyed by the lecturer on the implementation of STAD cooperative learning model on the course material constructivist learning theory.

Put that are considered important to the outcome of reflection open lesson activities 1 include:

1. Learning is presented in an interesting which makes the student can concentrate and be actively engaged in learning from the beginning to the end of the lecture.
2. Learning constructivist presented with a constructivist approach using STAD cooperative model begins with motivation for students to construct about constructivist theory. (Comments of observer: When the plan stage had predicted a philosophical aspects of epistemology in the process of acquiring knowledge through a constructivist approach).

Lecturer models will be designing their motivation that can be used to present the lesson. Finally obtained the appropriate form of motivation by providing visualization of the interaction analogy as contained in the lesson plan and executed in the open lesson 1. The visual media presented in Figure 7.

Students are enthusiastic to participate in the learning course on constructivist theory of learning materials with a constructivist approach using STAD cooperative learning model from the beginning to the end of learning.

Motivation of students indicated also by the active intraksi between students and lecturers, students with student and student-teaching materials.
Observed learning styles which attract between male and female students, students of dominant just read, is not supported by other activities, even the notes are still empty (student initial: Fhm), a student when reading is supported by other activities such as underlining, summaries or notes key sentence in their note.

In the working group there is an interesting interaction patterns as between members of the group.

a. Members of the group split again into two, each discussing in pairs.

b. Group members do not separate and discuss together.

c. Group members do not separate but each learn on their own individually.

Another interesting thing, though students (Fhm) is not recorded but active in expressing their opinions.

There are students who do not do the worksheet, but using the gadget as a source of learning, and not all worksheet is required.

Based on the notes and interesting insights and considered important, some things are used for designing the open learning lesson 2, for example, worksheet do not need to be given to all students.

Planning (Plan 2), (25 April 2016)

At this stage of the Plan, the lecturers team of Learning Theory course collaborate to develop a lesson plan that reflects a student-centered learning, based on feedback on the activities of reflection on DO and SEE 1.

Important things from the open lesson 1 reflection include:

- Learning: Learning media such as the open lesson 1, in the form of power point and handouts, meeting 2 is not necessary anymore.
- Student Worksheet need not be given to all students.
- Materials: a student-centered learning and constructivist

Implementation (Do) and See 2 (27 April 2016)

At the stage Do :

a. Implementation of learning based on a plan RPP 2 2 which was revised based on the reflection 1

b. Observation had been done by members of the lecturers team of Learning Theory courses

c. Learning Materials: student-centered and constructivist.

d. Implementation learning theory course in the room C5.01.08

Students more active in the implementation of learning in the open lesson 2, In addition student have more activities like discussions, do the task in cooperative groups. Students ready to learn from the beginning and participated by answering questions on apperception activities from lecturer at a introduction stage.
Image 8 The implementation of learning in the open lesson 2, (A) lecturer model of the activities apperception at a introduction stage, (B) the activity of the students by utilizing the whiteboard at the time of presentation, (C) students seem discuss cooperatively to answer questions from other students at when the presentation.

Constructivist learning activities with STAD cooperative learning in a group of students were transpiring actively. There were many interactions in a group or in class. The interaction can be described like pater that shown in Figure 9.

![Table]

Figure 9 Setting seat and interaction pattern of student in group on open lesson 2

Based Image setting the seating can be explained that the students interaction in the group in general transpiring actively from start to finish. Description for this figure, show that group 1 discussion blend of four members, two groups going good cooperation, early share into two groups (A2 and B2, C2 and D2), and then bargain collectively. Group 3 there are students who are less active discussion as students 3C. Group 4 is a discussion going among three students 4B, 4C and 4D, while students 4A taught himself frequently or use gadget. Group 5 in communication medium. The results of discussions on cooperative group work followed by a presentation and question and answer.

**Reflection 2 (28 April 2016)**
Submission impressions organizers by model lecturer on open lesson.
After conducting open lesson 2 model lecturer feel discover new things spontaneously in Learning Theory lecture improvement that can be studied include:
- Method of presentation regulation very nice technique by showing a group that will be a presentation using a lottery. Thus caused whole group is ready for doing presentation.
- The group that runs performed a select group by mentioning the topic goes.
- Question and answer progressing well
- Student groups presenter can still negotiate while the presentation. It can motivate students to pay attention to the current presentation group.

**4. CONCLUSION**
Based on the results of activities Lesson Study Based Programs that have been implemented in the subject matter constructivist learning theory can be summarized as follows:
Activity of Department Based Lesson Study (DBLS) programs of Learning Theory course on student-centered learning and constructivist material can be done well, consisting of phases carried out 2 times; Plan 1 and 2. Phase Do and See, accomplished Do 1 and 2, and reflection 1 and 2.

Efforts to enable students by using models based constructivist learning like STAD cooperative learning has been active from the beginning until the end of the lesson.

STAD Cooperative learning could take place, with students actively involved from start to finish learning the interaction patterns that vary in cooperative groups.

Suggestion

The study results of this study can be suggested that the approach to teaching or learning model can be applied directly to the model that will be taught, such as lecture material in this activity is to teach student-centered learning and constructivist learning with constructivist based learning like STAD cooperative learning. Similarly to other approaches or models that can be taught using the model.

5. REFERENCES


