IMPLEMENTATION OF SOCIO-SCIENTIFIC ISSUES LEARNING MODEL IN ENVIRONMENTAL KNOWLEDGE COURSE IN THE STATE UNIVERSITY OF SURABAYA

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Abstract: *To promote connection between biology content and social context, students need to be involved in Socio-scientific Issues (SSI) learning model. In doing so, involving 29 students majoring Biology Education enrolled in Environmental Knowledge course, to observe student's perception and student's achievement. Data were collected through questionnaires, test and observation, and then analyzed using qualitative descriptive technique. The findings reported that student's perception was increased toward SSI learning model (N-Gain=0,4), all of students were successful in student's achievement based on increasing of student's achievement (N-Gain=0,4) and there was positive and fair correlation between student's perception and student's achievement (rxy=0,4). However, further investigation need to be conducted for examining student's attitudes towards SSI learning model.*

Keywords: *Student's Perception, Student's Achievement, Socio-Scientific Issues (SSI)*

INTRODUCTION

Traditionally, in science education research, much attention has been concentrated on student achievement. However, over the past four decades, learning environments research has made significant progress through its focus on the assessment and investigation of the classroom environments all over the world. Perkins (1993) suggests the concept of person coupled system describing how the environment can affect a person's cognition (Perkins, 1993). The learning environment is not only a source of input or output of the receiver, but the vehicle of thought.

Traditional forms of science education tend to concentrate on the students who want to pursue careers in science, so that only serve a specific group of students. Since the beginning of scientific literacy movement, has argued that students should be scientifically literate in order to be functional members of society. Roberts (2007) suggests that scientific literacy can be divided into Vision I and Vision II. Vision I is about the laws and theories of science and also processes such as hypothesis and experiment. From this perspective, school science should focus on the knowledge and skills that enable students to close and think about the situation as a professional scientist. According to the Vision II, schools science must allow students to close and think of science as a member of society, and school science must educate students in developing their knowledge and skills appropriate (Roberts, 2007).

The main goal of science education itself is enabling students to make decisions that are informed by science on real life issues (Ryder, 2001). Student deliberation and discussion socio-scientific issues (social, ethical, and political issues related to science) are the object of central study of in science education (Albe, 2008). Therefore, in science learning is needed learning approach that covers the purpose of science education. One of learning approaches that can cover the objective is Socio-Scientific Issues (SSI) based learning.

The objectives of this research are to increases student's perception, student's achievement and there is correlation between student's perception towards Socio-Scientific Issues based learning and student's achievement.

RESEARCH METHOD

A. Subject of Research

Subject of this research is single class 29 students of State University of Surabaya in even semester year 2014-2015. This research will be conducted in International class, where the learning in this class using English.

B. Research Design

This research uses One-Group Pretest-posttest design (Tuckman, 1978: 142) with the following design:

O1 X O2

Description:
O1 = *Pre Test*
X = Treatment
O2 = *Post Test*

C. Procedure of Research

Procedure of this research consists of two phases: preparation and implementation phase.

Preparation phase. Activities undertaken in the preparation phase is to make the learning material and prepare research instruments that are used in this research. Learning material includes syllabus, lesson plan, student worksheet and student achievement test that is used is proper.

Implementation. Implementation of learning activities includes the delivery of learning materials, provision of worksheets, and learning test.

D. Technique of Data Collecting

There are some of technique of data collecting in this research, namely questionnaire, test and observation. teknik pengumpulan data pada penelitian ini. Questionnaire is given to obtain student's perception toward SSI learning model. Test is given to obtain student's achievement. Observation is done to determine the enforceability of the lesson plan, the constraints experienced during learning activities.

E. Technique of Data Analysis

Data of research findings are analyzed qualitative descriptively. The data are student's perception, student's achievement, correlation between student perception and student achievement and lesson plan implementation. Data of student's perception pretest and posttest is analyzed by *N-gain Score* to know the increasing of student's perception. Data of student's achievement pretest and posttest is analyzed by *N-gain Score* to know the increasing of student's achievement. Correlation between student perception and student achievement is analyzed by product moment (Guilford, 1956). Data of lesson plan implementation is determined by compare evaluation average of two observers.

RESEARCH FINDINGS AND DISCUSSION

This research is done in implementation phase, but before implementation, researcher develops learning material and the learning material is validated by expert of education and expert of environment. In detail, the implementation phase as follows.

A. Student's Perception

Student's perception is the perception as the interpretation of students' feeling and opinion about implementation of socio-scientific issues based learning. Student perception towards Socio-Scientific Issues (SSI) learning model is known using SSI questionnaire. The use of student's perception on learning environment instrument could be used to help in addressing the difficulties associated with the evaluation of the practical skills and of attempts to implement new teaching strategies in the classroom. The using of student's perception of learning environment is guiding of lecture improvement. Lecture are able to use feedback based on student's perception of the learning environment in a meaningful and constructive way that can enhance their teaching practice (Aldridge *et al*, 2009).

Result of student's perception experience increasing in posttest. The increasing can be seen in the Diagram below.

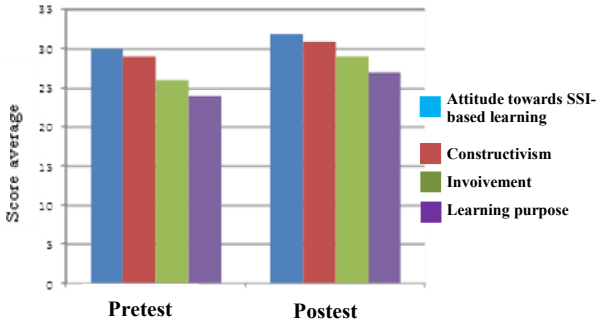

Diagram 1. Diagram of Student's Perception

Using student's perception and lecture's perceptions to study educational environments can be contrasted with the external observer's direct observation and systematic coding of classroom communication and events (Brophy & Good, 1986). Defining the classroom or school environment in terms of the shared perceptions of the students and teachers has the dual advantage of characterizing the setting through the eyes of the participants themselves and capturing information which the observer could miss or consider unimportant. Students are at a good vantage point to make judgments about classrooms because they have encountered many different learning environments and have enough time in a class to form accurate impressions. Also, even if a lecture is inconsistent in their day-to-day behavior, they usually project a consistent image of the long-standing attributes of classroom environment (Fraser, 2001).

Increasing of student's perception can be measured by N-Gain. N-Gain of student's perception is 0,4. Criteria of N-Gain based on Hake (1998) divided into 3 levels, namely: (1) (2) learning with "high gain", if <g> ≥0.7; learning with " medium gain", if 0.7> <g> ≥ 0.3; and learning with "low gain", if <g> <0.3. Increasing of student's perception obtained N-Gain score with medium gain in category. It means that student's perception is medium towards SSI learning model.

B. Student's Achievement

Socio-scientific issues-based learning emphasizes on ethics in science, leads reasoning and nature of reality into ethics. Socio-scientific issues are very useful for students to awake their thinking ability and decision-making skills based on evidences and nature of science. Socio-scientific issues-based learning can gain student's scientific reasoning skills and making scientific argumentation (Sadler *et al*, 2006).

Result of student's achievement experience increasing in posttest. The increasing can be seen in the Diagram below.

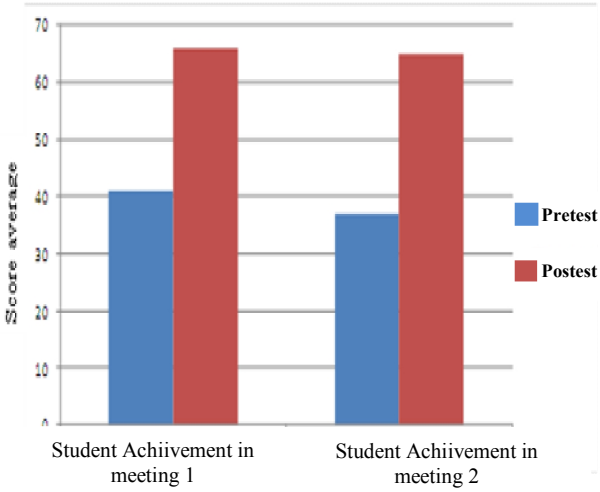

Diagram 2. Diagram of Student's Achievement

Student's achievement is analyzed with N-Gain to know student concepts mastery. N-Gain of student's

achievement is 0,4. It means that concepts mastery through SSI learning model is medium. Student's achievement increases after treatment with SSI learning model. Analyzing of N-Gain also shows differences between before and after treatment.

Findings by Saunders (2011) stated that in terms of academic outcomes, all of the teachers agreed that for successful ethical discussion and ethical decision making, the students needed knowledge of the science concepts behind the issue. They commented that the students moved from being poorly informed to well informed, and that as a result of the teaching and learning activities most students had increased their science knowledge and understanding. Teacher also perceived that the use of the model in the classroom resulted in positive student achievement, including increased student learning and understanding of the science concepts associated with the issue, a high level of student engagement and motivation when exploring issues and an increased awareness of how ethical decision were made.

C. *Correlation Between Student Perception and Student Achievement*

Correlation measures the direction and strength of the linear relationship between two quantitative variables. The correlation is always a number between -1 and 1 (Moore,2009). Value of the correlation between student's perception and student's achievement in this research is 0,4. It means that it was a positive and fair correlation.

According to Biggs (as cited in Gulikers *et al*., 2006), students' perception can affect student learning in two ways. Firstly, it may affect directly on students' achievement. Secondly, it has influence in learning outcomes indirectly by affecting students' study approach, that is, deep or surface learning.

D. *Lesson Plan Implementation*

In the first meeting, lesson plan implementation obtains in each activity, namely introduction, main activity and closing have 3,7; 3,8, 4 score respectively. In the second meeting, lesson plan implementation in each activity, namely introduction, main activity and closing have 3,9; 3,85; 4 score respectively. All of activities are well done. Result of lesson plan implementation in the first and second meeting can be presented shortly in Diagram below.

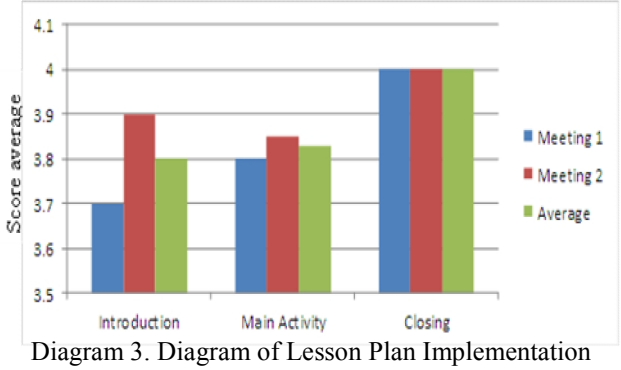

Diagram 3. Diagram of Lesson Plan Implementation

Reliability of lesson plan implementation is 85%. The reliability obtains high score, hopefully if the lesson plan is done in other classes in university will obtain the same result. This reliability shows steady (consistency of learning implementation) if the lesson plan is tried in the second will obtain same result. Every measuring contains mistake, measuring is repeated in different time never give same result (Ibrahim, 2005).

Lenz (2012) reported that teaching issue-oriented science takes careful planning and designing of lesson or activities. When implemented properly, it can result in significant benefits to student learning. The relevance and engagement provided by issue-oriented science also help students understand the nature of science and develop the skills of scientific literacy that will prepare them to think critically about the issues that face society now and in the future.

CONCLUSION

A. *Conclusion*

The student's perception towards Socio-Scientific Issues (SSI) learning model and the student's achievement was increased. There was a positive and fair correlation between student's perception and student's achievement.

B. *Suggestion*

Based on result of research that had done, there are suggestion as follows:

1. Based on research result that show student's perception was increased, so researcher suggests this research done in others biology matter using SSI learning model.
2. This research was done just to know student's perception toward Socio-Scientific Issues (SSI) learning model and achievement, researcher suggests further research is done to know student's attitudes.

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