

IMPLEMENTATION OF SOCIO-SCIENTIFIC ISSUES LEARNING MODEL TO INCREASE STUDENT'S ACHIEVEMENT IN ENVIRONMENTAL KNOWLEDGE COURSE

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Abstract

To increase student's achievement that connect between biology content and social context life, 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 achievement. Data were collected through test and observation, and then analyzed using qualitative descriptive technique. The findings reported that student's achievement were increased toward SSI learning model (N-Gain= 0,4)

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

INTRODUCTION

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 model that covers the purpose of science education. One of learning approaches that can cover the objective is Socio-Scientific Issues (SSI) based learning.

Socio-Scientific Issues-based learning is an active model to learning, placing science content within a social context in a way that supplies both motivation and the ownership of learning to the student (Klosterman & Sadler, 2010). In Socio-Scientific Issues-based learning, students are challenged to explore the controversy surrounding issues that are informed by science, integrating social aspects (moral, ethical and economic)

and other individual or group perspective, and develop a position based on their investigation. Socio-Scientific Issues-based learning stimulate students aware moral, ethics, concerns, values and social participation at all level (Nuangchalerm, 2009).

The objectives of this research are to increases student's achievement with Socio-Scientific Issues (SSI) learning model.

RESEARCH METHOD

A. Subject of Research

Subject of this research is single class, consist of 29 students of State University of Surabaya.

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 test and observation. 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 achievement and lesson plan implementation. Data of student's achievement pretest and posttest is analyzed by *N-gain Score* to know the increasing of student's achievement. 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, the implementation phase as follows.

A. Student's Academic Skills

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.

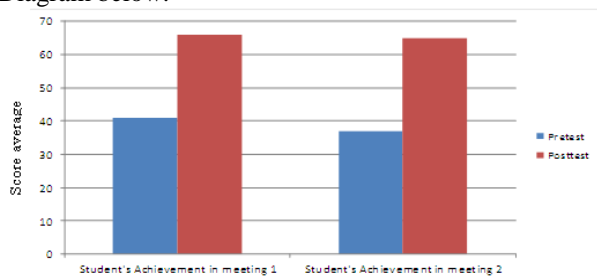


Diagram 3. Diagram of Student's Academic Skills

Student's academic skills are analyzed with N-Gain to know student concepts mastery. N-Gain of student's academic skills are 0,4. It means that concepts mastery through SSI learning model is medium. Student's academic skills increase 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 academic skills, including increased student learning and understanding of the science concepts associated with the

issue, identifying variables and describing relationship among them, formulating hypothesis, designing and doing experiment.

B. 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 5. 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

Conclusion

Socio-Scientific Issues (SSI) learning model can increase student's achievement. It is showed by N-Gain= 0,4.

Suggestion

Based on research result that show student's achievement was increased, so researcher suggests this research done in school or others college using SSI learning model.

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