

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

Elmi Listyoningsih, Rahmanto Dwi Saputro

Universitas WR. Supratman, Jalan Arief Rahman Hakim No. 14, Surabaya, Indonesia

E-mail: lmielis@yahoo.com

ABSTRACT

To encourage connection between biology content and social context to try life skills, 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 life skills 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 life skills consist of academic skills, personal skills, social skills and vocational skills were increased toward SSI learning model ($N\text{-Gain}=0,4$), all of students were successful in student's achievement based on increasing of student's achievement ($N\text{-Gain}=0,4$).

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

1 INTRODUCTION

Education today is much more about ways of thinking which involve creative and critical approaches to problem-solving and decision-making. It is also about ways of working, including communication and collaboration, as well as the tools they require, such as the capacity to recognise and exploit the potential of new technologies. And last but not least, education is about the capacity to live in a multi-faceted world as an active and engaged citizen.

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). Socio-Scientific Issues-based learning can try student's life skills.

Life-skills are psycho-social abilities for adaptive and positive behaviour that enables individuals to deal effectively with demands and challenges in their environment. It is a behaviour change approach that is based on knowledge, attitude and action.

The objective of this research is to increase student's life skills with Socio-Scientific Issues (SSI) learning model.

2 RESEARCH METHOD

A. Subject of Research

Subject of this research is single class consisting of 29 students of State University of Surabaya in even semester in the academic year of 2014-2015.

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.

In Preparation phase, activity 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.

While 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.

Questionnaire is given to obtain personal and social skills. Test is given to obtain academic skills. Psychomotor is given to obtain vocational skills. 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 qualitatively descriptively. The data are student's life skills that consist of personal, social, academic, and vocational skills and lesson plan implementation. Data of student's personal and social skills pre-test and post-test are analyzed by *N-gain Score* to know the increasing of student's personal and social skills. Data of academic and psychomotor skills pre-test and post-test is analyzed by *N-gain Score* to know the increasing of student's academic and vocational skills. Data of lesson plan implementation is determined by compare evaluation average of two observers.

3 RESEARCH FINDINGS AND DISCUSSION

This research is done in implementation phase, the implementation phase as follows.

A. Student's Personal Skills

Student's personal skills are self-awareness and thinking skills. Student personal skills are known using SSI questionnaire. The using of student's personal skills on learning could be used to assess them and know in which areas they need to strengthen and in which expertise are they a natural and work accordingly. The using of student's personal skills are guiding of lecture improvement. Lectures are able to use feedback based on student's personal skills in a meaningful and constructive way that can enhance their

teaching practice (Aldridge *et al*, 2009).

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

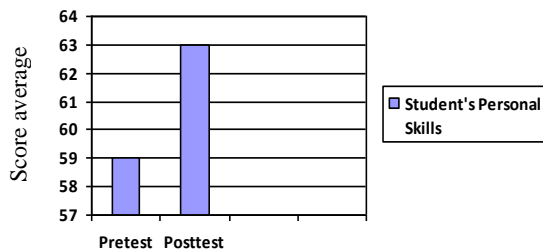


Diagram 1. Diagram of Student's Personal Skills

Self-awareness, self-esteem and self-confidence are essential tools for understanding one's strengths and weaknesses. Consequently, the individual is able to discern available opportunities and prepare to face the issues. This leads to the development of a social awareness of the concerns of society. It is possible to identify problems that arise in society. With life skills, one is able to explore alternatives, weigh pros and cons and make rational decisions in solving each problem or issue as it arises.

Thinking skills or decision-making skills include decision-making or problem solving skills and information gathering skills. The individual must also be skilled at evaluating the future consequences of their present actions and the actions of others. Students need to be able to determine alternative solutions and to analyze the influence of their own values and the values of those around them. Thinking skills are inevitable to become successful in professional life as well as personal life.

Increasing of student's personal skills 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 $\langle g \rangle \geq 0.7$; learning with "medium gain", if $0.7 > \langle g \rangle \geq 0.3$; and learning with "low gain", if $\langle g \rangle < 0.3$. Increasing of student's personal skills obtained N-Gain score with medium gain in category. It means that student's personal skills are medium.

B. Student's Social Skills

Student's social skills are skills that consist of communication and collaboration skills. Cooperate skills are much needed because human are social living things. In daily activities, human always cooperate with others. In cooperate, tolerance is needed.

Student's social skills are known using SSI questionnaire. The student's social skills are shown in the Diagram below.

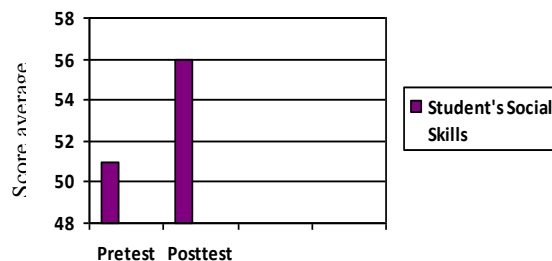


Diagram 2. Diagram of Student's Social Skills

Increasing of student's social skills is measured by N-Gain. N-Gain score of student's social skills are 0,3. It is medium category. Student's social skills with SSI learning model are medium.

An advantage for educators of the educational approach over the emotional intelligence approach to life skills is that the character virtues are concrete and specific and more easily translated into teachable, learnable curricula. It is much easier to deal with "empathy", "cooperation", or "fairness" as discrete, teachable values.

An educator also can choose instructional strategies that include virtues as an embedded curriculum topic (Kagan, 2004).

C. 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.

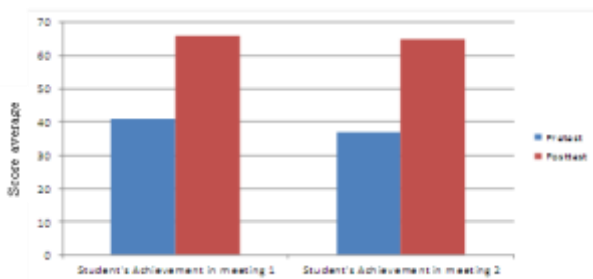


Diagram 3. Diagram of Student's Academic Skills

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.

D. Student's Vocational Skills

Student's vocational skills are includes every form of skills that aims to the acquirement of qualifications related to a certain profession, art or employment or that provides the necessary training and the appropriate skills as well as technical knowledge, so that students are able to exercise a profession, art or activity (Kotsikis, 2007). In this learning, student's vocational skills show by experiment. If students solve the problem with the experiment, student score is 1. In other hand, if students solve the problem without experiment, student score is 0. Student's vocational skills in each meeting are shown in the Diagram below.

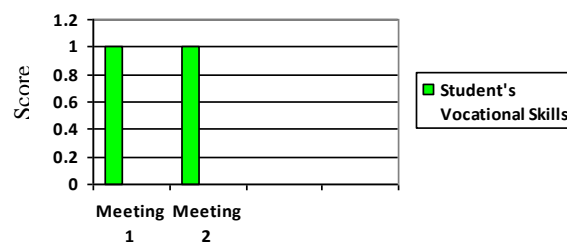


Diagram 4. Diagram of Student's Vocational Skills

Vocational skills can be seen as an activity or a set of activities designed in order to transmit theoretical knowledge that are required for certain types of jobs (Kotsikis, 2007). Vocational skills can develop the professional knowledge and skills required for the practice of a profession. It also assists the students in their gentle adjustment to the changes in the productive procedures. Vocational skills cultivate the integration of the students in professional life and in community as well.

E. 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.

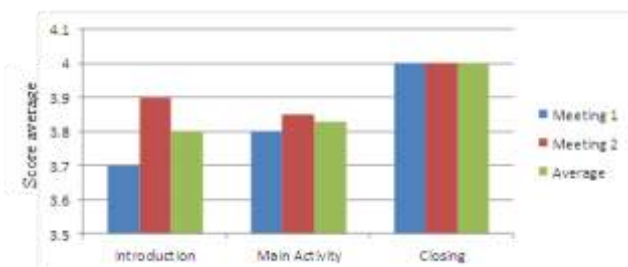


Diagram 5. Diagram of Lesson Plan Implementation

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.

4 CONCLUSION

A. Conclusion

Socio-Scientific Issues (SSI) learning model can increase student's life skills that consist of personal, social, academic, and vocational skills.

B. Suggestion

Based on research result that show student's life skills was increased, so the researcher suggests this research done in others biology matter using SSI learning model.

Teachers. *Jurnal of Social Sciences*, 5(3): 239-243.

REFERENCES

- Albe, V. 2008. Students' positions and considerations of scientific evidence about a controversial socioscientific issue. *Science & Education*, 17(8-9), 805 – 827.
- Aldridge, J.M., Fraser, B.J., & Ntuli, S. 2009. Utilising learning environment assessments to improve teaching practices among in-service teachers undertaking a distance education programme. *South African Journal of Education*, 29, 147-170.
- Asep, S. 2010. *Pengantar Metode Statistik II*. Jakarta: Rineka Cipta.
- Ibrahim, M. 2005. *Asesmen Berkelanjutan*. Surabaya: Unesa University Press.
- Kagan, Spencer. 2004. *Addressing the Life Skills Crisis*. CA: Kagan Publishing.
- Klosterman, M., & Sadler, T.D. 2010. Multi-level assessment of content knowledge gains in the context of socio-scientific issues-based instruction. *International Journal of Science Education*.
- Kotsikis, V. (2007). *Educational Administration and Policy*. Athens: Ellin.
- Lenz, L. 2012. *Using Socioscientific Issues to Engage Biology Students*. California: University of California Press.
- Nuangchalerm, P. 2009. Development of Socioscientific Issues-Based Teaching for Preservice Science Teachers. *Jurnal of Social Sciences*, 5(3): 239-243.
- Ryder, J. 2001. Identifying science understanding for functional scientific literacy. *Studies in Science Education*, 36(1), 1-44.
- Sadler, T.D., Amirshokooi, A., Kazempour, M., & Allspaw, K.M. 2006. Socioscience and ethics in science classrooms: Teacher perspectives and strategies. *Journal of Research in Science Teaching*, 43(4), 353 – 376.
- Saunders, K.J., & Rennie, L.J. 2011. A Pedagogical Model for Ethical Inquiry into Socioscientific Issues In Science. *Research in Science & Technological Education*, 43: 253-274.
- Tuckman, B.W. 1986. *Conducting Educational Research Second Edition*. USA: Harcourt Brace Jovanovich, Publisher.