DEVELOPING SETS (SCIENCE, ENVIRONMENT, TECHNOLOGY, AND SOCIETY) LEARNING MEDIUM IN LAB SCHOOL ELEMENTARY SCHOOL UNNES

SRI SULISTYORINI

Primary School Teacher Education, FIP,UNNES
E-mail: boendha_rini@yahoo.co.id

Abstract— SETS (Science, Environment, Technology, And Society) is an approach to learning science. The purpose of this study is to develop SETS as an effective and practical science-learning aids. The research approach is Research and Development (R & D). The subjects of this study were students and teachers of elementary Labschool Unnes. Data was collected using observation, interviews, questionnaires, and tests. Analysis of data used descriptive qualitative and paired t-test. The results show that SETS effectively improves learning outcomes and student learning activities. Lesson plans and teaching materials developed were easily implemented in learning activities. Teachers are suggested to develop a science-learning aids based on SETS competence.

Keywords— SETS, science-learning aids, learning outcomes.

I. INTRODUCTION

Sciences are associated with the natural way of finding out about nature in a systematic manner, so that it is not only a mastery of knowledge in the form of a collection of facts, concepts, or principles, but also a process of discovery. SETS (Science, Environment, Technology, And Society), translated into Indonesian as*Sains, Lingkungan, Teknologi, danMasyarakat (Salingtemas)*, implies that learning activitiesmust always employ SETS. In a sense, learning materials must be placed in relation to the element of Science. Seeing Environment, Technology, and Society reciprocally will make us able to gain the benefit of learning outcomes greater than just understanding the concept of knowledge learned without seeing the connection in the context of SETS.

Efforts to get students learn science concepts contextually can be done by reviewing the concept by showing applications in technology or phenomena in everyday life. SETS iscapable of providing teachers a link between what is taught to students with real-world situations. In the learning process,teachers can raise issues in the community related to sciences then relate them to all forms of technology and the impact on the environment and society as well as how to solve them through positive actions.

Data from early observations in LabschoolUnneson learning aids used by science teachers shows that teachers have not employed SETS. Thus, many science teachers find it difficult to link the science concepts being studied as well as the relationship of the conceptsto the environment, technology, and society. The other problem is the unavailability ofsyllabus and lesson plan guides forteachers for the development of SETS specifically for science subjects in order to understand integration of the concepts. Science, Environment, Technology, and Society (Salingtemas or SETS) must be seen as a unit.

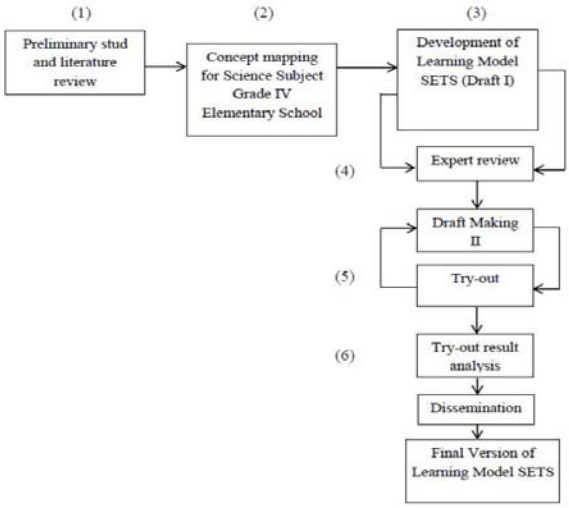
II. RESEARCH PROBLEMS

Based on the background of the problem, the research problems are formulated as follows:

1. Is the SETS learning aids developed valid?
2. How effective is the implementation of SETS learning aids developed?
3. How do teachers and students respond to SETS as science-learning aids?

III. RESEARCH METHOD

This study is Research and Development (R & D) that modify the design of research and development (Educational Research and Development) by Borg and Gall (1983). In developing SETS, researchers collaborate with elementary school teachers at LabschoolUnnes. Research design development can be seen in Figure 1.



(Figure 1. Development Model of SETS Learning Medium)

Product trials were conducted through two stages of development, namely the individual test and field test. Individual test was carried out by experts and subject teachers. Field test was conducted at Labschool Unnes. This testing is done with a quasi-experimental design or one group pretest-posttest design (Sugiyono, 2012), as described below:

$$Q1XQ_2$$

Figure 2.Quasi-Experimental Design

Note:
Q1 = Results of Pre-Test, X = Treatment, Q2 = Results of Post-Test

IV. RESULTS AND DISCUSSION

SETS as science-learning aidsconsisted of a syllabus, lesson plans, evaluation tools, and Student Worksheet,on competence standard of human digestion system, had been validated before use. Input from the validator was used to revise the learning device. The tests showed that the teaching materials were easy to understand, yet more SETS materials need to be added. Based on input from the validator, SETS was revised, and was further used in large-scale and small-scale trials.

Based on the results of implementation of SETS, learning activities were done well. On average, lesson plan was implemented 100% and learning tools could be used 100%. During learning of the digestive system, aids in the form of images and puzzle of the digestive organs and of food could be sorted by method of simulation. In addition, most of the groups could present the materials. Students were engaged in activities, most of the learning time was for discussion, observation, and linking with elements of SETS. The classroom atmosphere was very pleasant, as indicators, students were actively involved in relating learning materials with everyday life. SETS was more student-centered that students participated more in the learning process, they could develop ideas, they were challenged, they were creative, and SETS fostered curiosity, as mandated by the Standards Process. Students were excited to connect diseases associated with the digestive system and health including tooth loss and cavities (Science), dirty mouth, sweet foods (Environment), mouthwash, use toothbrush, toothpaste (Technology), and a habit to brush teeth before meals and bedtime (Society).

The observation of learning management shows that teachers wereskilled in implementing SETS which can be seen from the score of 3.7 from the scale of 1-4. Teachers firs started by conveying apperception, by linking students' experience on digestive organs, and motivation, in the form of a demonstration in which students worked on puzzle of digestive organs and describe them. The findings of this study are encouraging in that the student activities in learning showed a tendency to principles of student-centered learning. Students paid attention and listened to the teacher's explanations, asked questions and actively involved during group discussion group and in relating material with SETS. Student activities were quite good with a score of 3.75 from the scale of 1-4. Of the various activities, the most dominants were related to exploring new information and activeness in linking the material with SETSelements. This shows the suitability of characteristics of SETS with learning science as an attitude that demands fun learning process and full of stimuli, such as intensified group learning, as presented by Slavin (1994). SETS model is able to exploit the capabilities of students in discovering the concept of science, environment, technology, and society. In addition, students can express their work in the form of a diagram associated with science materials studied. Results of the work was displayed in the classroom and students were able to present the results of discussions in class. Student Worksheet was provided to guide the students to discuss and understand the material. Worksheet was provided for students to do experiment on carbohydrates as related to human digestion and health materials with elements of SETS.

Analisisis against learning outcomes showed that students achieved a minimum score of 75. Classicalachievement indicated that the class reached 87.5% of completeness, exceedingstandard set, and 85% of students achieved a minimum score of 75. Thus, in general, SETS model is suitable to be applied in Elementary School.

Other information confirmed students saw SETS in learning science as good and very positive with a score ranging from 94-100%; students thought class atmosphere as 100% positive; 94% of the students liked the way teachers teach science with SETS. Teachers saw SETS consisting oflesson plans, teaching materials, learning materials, and worksheets were very helpful in learning.

CONCLUSION

SETS learning method developed is valid and effective to increase student activity and student learning outcomes on digestive system material. Student activities are good, learning is student-centered, students are active in the discussions, students actively explore new information, and students are eager in linking the material with SETS elements. Student learning outcomes increase as well. Student and teacher response positively to SETS. In general, science-learning model employing SETS, in digestive system, developed in this study can be applied to learning science in elementary school.

SUGGESTION

For students learning to be meaningful, then in learning science, teachers can apply SETS approach

to raise the issues in society then linking them to technology and its impact on the environment, as well as how to solve them and what positive action to do to address this issue.

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