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## Drilling Students' Communication Skill through Science, Environment, Technology, and Society (SETS)-Based Learning

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**Abstract.** Student's communication skill paid less attention in learning activity at school, even though communication skill is needed by students in the 21<sup>st</sup> century based on the demands of new curriculum in Indonesia (K13). This study focuses on drilling students' communication skill through science, environment, technology, and society (SETS)-based learning. The research is a pre-experimental design with a one-shot case study model involving 10 students of ninth-grader of SMPN 2 Manyar, Gresik. The research data were collected through observation method using communication observation sheet. The data were analyzed using the descriptive qualitative method. The result showed that students' communication skill reached the completeness of skills decided both individually and classically in the curriculum. The fundamental result of this research that SETS-based learning can be used to drill students' communication skill in K13 context.

### 1. Introduction

Communication is defined as a process of conveying information containing the meaning from one party to others in order to have a mutual understanding [1]. Communication is a process of delivering a statement from a person to another as a consequence of social relationship [2]. Communication skills is the skill in conveying ideas or opinions, and thoughts to others in clear, logical, purposeful and systematic way so that the meaning can be understood by others [3]. Students require communication skills in term of knowledge dissemination. Learning science is basically aimed to provide learners with abilities to become scientists/researchers. In academic tradition, a researcher as a manufacturer of information will generate research results, ideas, and theories that are then communicated to the public through various forms of media [4].

The fact that happened so far is learners hesitated when asked to put forward their opinion or to do a presentation. Whereas, ideas the students gained from learning activities need to be communicated to other people as implementation of knowledge dissemination. Based on the pre-research data and the results of interview with a teacher of science education (IPA) subject in one of the secondary schools (junior high school) in Gresik, it was clear that the students' communication skills need to be paid more attention. In accordance with the written in *Permendikbud RI* No. 104 Year 2014 that the students' individual completeness on the skill aspect (in this case the communication skill) is set based on the optimum performance namely 2.67 (B-). The students are considered classically complete if the percentage of classical completeness is >75%.

The learning process requires an approach that can help students to understand the concept or matter can be communicate them with others effectively. Science, Environment, Technology and



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Society (SETS) constitutes one of the recommended approaches in the teaching-learning process at the secondary level [5]. Science-Technology-Society (STS) is one approach for curriculum designed to make concepts and simple processes existing on the subject of social science more precise and relevant to the students' lives [6]. According to Poedjiadi, the SETS-based learning basically gives an understanding on the relevance of science, technology and society, and is a vehicle to train learners' assessment sensitivity towards the impact of environment as a result of the development of science and technology [7]. The SETS-based learning has three fundamental principles, namely: (1) close relation between science, environment and society; (2) learning process based on constructivism; (3) covering five domains consisting of the domain of knowledge, attitude, process, creativity and application [8].

A research conducted by Dass suggested that the application of the SETS approach shows the improvement of learners' achievement in terms of mastering the concepts and processes; ability to apply concepts and the process of science in a new situation, most notably in real life [9]. Other studies on the SETS approach also showed positive results; the increase of learners' attention towards their lessons. Learners are able to connect concepts they learned with experience they gained in real life through the SETS learning [10]. Another study by Rusilowati and team demonstrated that the SETS-based learning was effective in developing students' understanding towards natural science (IPA) [11]. Another research result also described that learning process through science-technology-society (STS) had more significant impact on making students understand the science concept than text book oriented learning [12].

The purpose of this research is to promote students' communication skills through SETS-based learning. Ten students of ninth-grader in junior high school were involved in this research. The result showed that 80% of the student achieved completeness that decided in communication skills. This was because SETS-based learning conditioned students in many activities to interact and communicate one another as well as help train their communication.

## 6 Method

This research is a pre-experimental design with one-shot case study model in which there was a group treated and then observed [13]. Subjects of the research were 10 students of Class IX of Even Semester Year 2016/2017 located in junior high school (SMPN) 2 Manyar, Gresik, East Java. The treatment given was a learning activity through SETS-based learning conducted during 3 meetings. A learning materials based on SETS which was aimed to train students' communication skills was applied. The learning materials was previously validated by two experts and was claimed valid.

The research instrument used a communication observation sheet that was developed by researchers. Moreover, aspects of observed communication skills consist of four components: skill in asking questions, skill in answering them, skill in coming up with ideas or opinions, and skill in oral presentation.

Analysis of students' communication skill was obtained from observation conducted by two observers. Data obtained were analyzed for understanding the completeness of students' communication skills both individually and classically. Individual completeness was calculated by dividing students' maximum scores and then timing them with 4. Student scores obtained from observation were converted to *Permendikbud RI* No. 104 Year 2014 [14] as provided on Table 1.

**Table 1.** Score Range of Competence Skills

Score	Predicate
3,85 – 4,00	A
3,51 – 3,84	A-
3,18 – 3,50	B+
2,85 – 3,17	B
<b>2,51 – 2,84</b>	<b>B-</b>

Score	Predicate
2,18 – 2,50	C+
1,85 – 2,17	C
1,51 – 1,84	C-
1,18 – 1,50	D+
1,00 – 1,17	D

Individual completeness for competence of communication skills was decided based on optimum performance namely 2,67 (B-). However, classical completeness was calculated by dividing all complete students over students in total and then timing them with 100%. The students are considered classically complete if the percentage of classical completeness is >75%.

### 3. Result and discussion

Analysis of students' communication skills was obtained from data of observation results conducted by two observers observing students by using the observation instrument sheet of communication skills. The analysis results of the observation score on communication skills can be seen in Table 2.

**Table 2.** Analysis Result of Students' Communication Skills

Student	Students' Communication Skill Aspect				$\bar{x}$	P	C
	K1	K2	K3	K4			
SW1	3.0	2.7	3.3	3.0	3.0	B	T
SW2	3.0	1.7	3.0	2.3	2.5	B-	TT
SW3	1.7	3.0	3.3	3.3	2.8	B-	T
SW4	2.3	3.0	2.7	3.3	2.8	B-	T
SW5	2.0	3.7	3.0	2.7	2.8	B-	T
SW6	2.7	3.0	2.7	3.0	2.8	B-	T
SW7	3.3	2.7	3.0	3.3	3.1	B	T
SW8	2.7	2.7	2.3	2.7	2.6	B-	T
SW9	3.0	2.3	3.0	3.3	2.9	B	T
SW10	2.7	2.3	2.3	2.3	2.4	C+	TT

Explanation

K1: Asking a question

K2: Answering a question

K3: Giving opinion

K4: Oral presentation

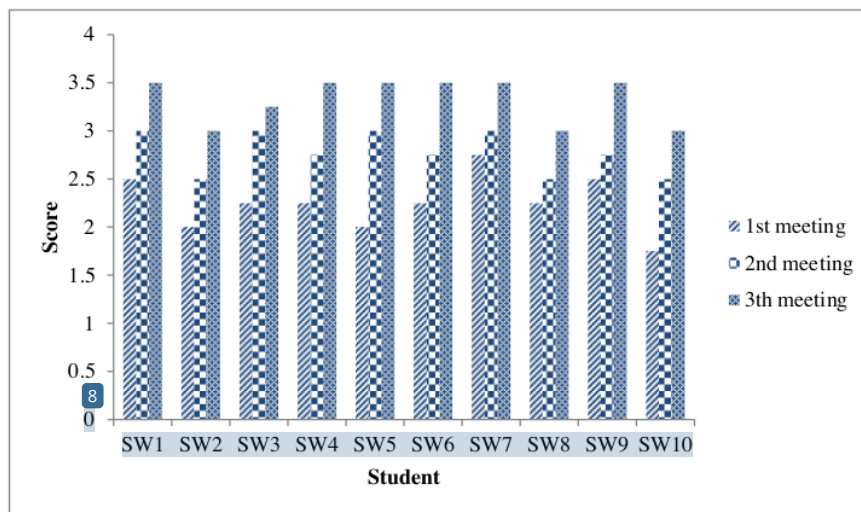
$\bar{x}$  : average

P : predicate

C : completeness

T : completed; TT : incomplete

Based on the observation results presented in Table 2, it is known that 8 of 10 students are declared to have reached the completeness. The results automatically show that 80% of students have classically completed. A learning process should ideally not only customize the students to receive the information, to remember, and to memorize. Moreover, students are expected to convey what they have received to others, including give and respond ideas. Communication skills which are trained in this study focuses on the students' communication skills both verbally and non-vocal, covering several aspects, namely: ask a question, answer a question, put forward ideas, and oral presentation. Analysis of students' communication skill was also served in graph as shown on Figure 1. Students' achievement in gaining the completeness of both individual and classical communication skill was because the SETS-based learning is able to create a situation which enables students to actively interact with one another and with teachers. This will help students train their communication skill.



**Figure 1.** Analysis Result of Students' Communication Skills

The learning activity is adjusted with stages of the SETS-based learning style consisting of some stages: (1) invitation, (2) concept development, (3) concept application, (4) concept establishment, (5) assessment [7]. The first stage known as introduction constitutes invitation which is designed to make students focused on learning. In this research a teacher starts learning activity with appreciating and motivating students. The introduction process was done well according to needs, materials, methods, environment, and teachers' skills as well, learning process would be optimal [15]. The second stage of SETS model is the formation or development of concept. The formation process of the concept in this research was conducted through discussion, in which students were divided into some small groups based on teachers' decision. Each group was asked to discuss the topics provided in LKS. The students had opportunity to engage in dialogue and to share opinion on a concept that encouraged them to ask and answer a question or give opinion within the group during discussion. Discussion held by small groups also helped students develop the concept well. This is suitable for socio-constructivism learning method theory arguing that if a teacher can provide a supporting social environment, students can develop their knowledge and understanding well [16].

The third stage is the application of the concept in the form of analysis of the issue or problem solving. At this stage, the teacher displayed an issue closely related to daily life. Students were then asked to discuss the issue with their respective groups. The problems presented in learning can foster students' spirit to find solutions to a problem [17; 11]. Presentation activities took place after class discussion of the stage 2 and stage 3 completed, each group was asked to convey the discussion results through oral presentations in front of the classroom and then continue with the interview session. The main achievement of learning can be seen from the meaning and the understanding. That can be achieved if students are able to explain ideas derived from facts, ask a relevant question, and apply it in daily life. [18].

During the process of the formation of concepts and the analysis of issues/problems (stage 2 and stage 3) teachers need to straighten out when there is a misconception over the activities in progress. The fourth stage in learning SETS is known as the stage of the establishment of the concept. If there is no misconception during the process of concept formation, as well as after the end of the analysis of issues and problem solving, teachers still need to develop the concept as syntax of SETS learning (4th stage) through an emphasis on the key concepts that students need to know. The fifth stage of the SETS learning model is assessment. At this stage, checking students' understanding through questions

about biotech material was conducted. Assessment is aimed to find out toward extent the students understand the material through understanding check either literally or orally.

## 5 Conclusion

Based on the research described above, it can be concluded that student's communication skill trained by looking into the achieving of completeness of each student both individually and classically. Therefore, science environment technology and society (SETS)-based learning can be considered a learning model which is suitable for the demand of curriculum in order to train students' communication skill.

## 5. Acknowledgements

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