Students' Written Communication Skills on the Subject of Chemical Basic Laws Taught by Using ELPSA

Farny Sutriany Jafar
Department of Early Childhood Education
Teacher Training and Education Faculty of Mulawarman University
Samarinda, Indonesia
farny.sutriany@fkip.unmul.ac.id

Budi Rahardjo
Department of Early Childhood Education
Teacher Training and Education Faculty of Mulawarman University
Samarinda, Indonesia
rahardjobudi42@gmail.com

Windya Natasya
Department of Early Childhood Education
Teacher Training and Education Faculty of Mulawarman University
Samarinda, Indonesia
windyanatasya25@gmail.com

***Abstract*—The aims of this study were to analyze the senior high school student's written communication skills on the subject of chemical basic laws taught by using ELPSA (Experiences, Language, Picture, Symbols, and Application) learning design. The type of this research is descriptive quantitative. Subject of this research was 33 of 10th grade science students at SMA Negeri 8 Samarinda, East Kalimantan, Indonesia that were chosen by using purposive sampling technique. The written communication skills were analyzed by using post-test. It consisted of (1) Ability to express ideas; (2) Ability to explain observation results; (3) Ability to communicate data processing and analysis; (4) Ability to conclude research results and to communicate the conclusions based on the data; (5) Ability to present the data in the form of tables, graphs, flowcharts and concept maps; (6) Ability to present figure of experiment equipment; (7) Ability to specify the research variables; and (8) Ability to present the model of relations with international symbols and standards. The results showed that the written communication skill of the subject research was 44.60, categorized as sufficient capability. Therefore, there should be further development and research to increase student ability on written communication.**

Keywords— written communication skills, ELPSA, chemical basic laws

I. INTRODUCTION

Chemistry is built through process skills [1]. Process skills are physical and mental skills of students to obtain and process information. The process of acquiring and processing information is the basic foundation for students to communicate well. People who have good communication skills can overcome problems in their environment, establish good social interactions with others, and be more successful in their professional lives [2]. Communication skills play an important role in the teaching and learning process [3]. Learning goals cannot be achieved properly if the communication between teachers and students is not synergized and connected well. Students' communication skills can be measured by using ELPSA (experiences, language, picture, symbols, and application) learning design. ELPSA learning design is based on constructivist learning theory that gives teachers the opportunity to make innovation in design and implementation of learning and opens opportunities for students to be active in the learning process [4]. This learning design creates a complex learning process, interconnected and complementary which includes experiences, language, picture, symbols, and application, so that the ELPSA is expected can improve students' communication skills.

Verbal communication skills are divided into oral and written communication skills. Oral communication is the process of delivering thoughts, messages or feelings by using language [5]. Oral communication in learning involves interaction between teacher and students, students and teachers, or students and students [6]. Written communication is the process of conveying thoughts, messages or feelings from someone to others by using writing [5]. Writing is conveying ideas to the reader by arranging or organizing sentences [7].

Writing skills have some difficulties in expressing ideas, organizing sentences and vocabulary, and writing rules. Several studies have been conducted in the application of ELPSA learning designs in a classroom; can provide better learning conditions and outcomes [8, 9, 10]. Based on the description above, to find out the communication skills of students in writing, a study was conducted on the subject of basic chemical laws by applying the ELPSA learning design.

II. METHOD

This research was categorized as descriptive quantitative research, conducted at Senior High School namely SMA N 8 Samarinda, East Kalimantan, Indonesia in April 2017. Subjects of this research were 33 students, a group of tenth grades of math and natural science students namely "siswa kelas X IPA 3" and were selected by using purposive sampling technique. They were taught by using ELPSA learning model on the subject of chemical basic laws. The subjects were divided into five groups and members at each group were designed heterogenic based on their learning outcome on previous subject.

Student written communication skills was analyzed by using posttest. The posttests were represented and could measure of the written skill of students. Eight skills were identified, they were of (1) Ability to express ideas; (2) Ability to explain observation results; (3) Ability to communicate data processing and analysis; (4) Ability to conclude research results and to communicate the conclusions based on the data; (5) Ability to present the data in the form of tables, graphs, flowcharts and concept maps; (6) Ability to present figure of experiment equipment; (7) Ability to specify the research variables; and (8) Ability to present the model of relations with international symbols and standards.

III. Result and Discussion

Average score of written communication skills of student are shown in table 1.

TABLE I. STUDENT WRITTEN COMMUNICATION SKILLS

No	Skills	Score	Criteria
1	Ability to express ideas	58.47	Enough
2	Ability to explain observation results	31.34	Low
3	Ability to communicate data processing and analysis	58.88	Enough
4	Ability to conclude research results and to communicate the conclusions based on the data	76.52	Good
5	Ability to present the data in the form of tables, graphs, flowcharts and concept maps	20.56	Low
6	Ability to present figure of experiment equipment	61.46	Good
7	Ability to specify the research variables	12.44	Very low
8	Ability to present the model of relations with international symbols and standards	76.52	Good

According to table 1, it is clear that the student ability to express ideas was enough. In this ability, pictures, graphs and tables related to the topics were provided. The students were asked to write their interpretation according to instructions. The way would measure their ability to write their idea down. Based on the student answers, most of students could write their idea and solve the questions that consist of figures and graphs well. On the other hand they were not success to solve the questions that consist of table.

Students' ability to explain observation results was low (see table 1). This phenomenon could be seen from the student answers. Almost of them could not explain the data of observation that have been provided on the questions. They could not explain the reason of happened phenomena or data trend on the questions. This phenomenon show that student concept about the topic was low.

On communication data processing and analysis ability as shown in table 1, students showed an enough skill. In this skill, students must process and analyses provided data on the question and write the processes and results down. Half of the students have a difficulty to solve this question type. It was due to low understanding of student concept. It was also influenced by weakness of students on mathematical abilities.

Ability to conclude research results and to communicate the conclusions based on the data of student was good. Almost of students was success to create and to write the conclusion of provided data based on the instruction. This phenomenon caused by the availability of data and facts, students made conclusion by using their own sentences briefly.

Students' ability to present the data in the form of tables, graphs, flowcharts and concept maps was low. Almost of student could not convert provided data into graph. The students were not familiar with this question type and they did not know the way to show a data on a graph flowcharts and concept maps.

Only a few students could not present figure of experiment equipment. In this ability, they have a good skill. Almost of the students could draw the equipment. Although they have some mistakes in naming the equipment, but they have a good memorize on the drawing the equipment look like.

Ability to specify the research variables of students were very low. Half of them were not solving the question and other students were not solving correctly. Student has low knowledge to identify and specify the variables. In addition, they were rarely faced type of these questions.

Many of students have good ability to present the model of relations with international symbols and standards (see table 1). They have not big problem in solving kind of this question. They have practice and intense faced typical of the question in other subject such as math and physic.

IV. Conclusion

Generally, the written communication skill of the subject in this research was in the level of enough. It is necessary to find out the way to increase the ability of students in written communication.

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