Students Profile’s Scientific Process Skills on Ecosystem Material Viewed from Favorite High School

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Abstract. This study aims to determine the profile of scientific process skills of students in state high school in Bantul Regency, Indonesia in term of favorite school. The population of this study is a state high school in Bantul Regency which has become a pilot project and has implemented the curriculum of 2013 starting in 2013/2014 with total 4 school. The study sample involved 339 students of grade X. Source of students’ scientific skill profile data are from written tests, while favorite schools were obtained from interviews. Validity and reliability using Kappa coefficient and item sensitivity index. Data processing is done descriptively. The results of the study are: (a) Profile of scientific process skills competency capability of the students of state high school in Bantul Regency was very good. (b) The level of students’ preference towards the favorite school affects the ability of scientific process skill in learning process of subject Biology.

Keywords: Students profile; Scientific process skills; Ecosystem material; Favorite School.

1. Introduction
Scientific process skills (SPS) approach is a form of a learning approach that gives chance to students to live up with the discovery or preparation of a concept as a part of scientific process. In the correlation of process skill and teaching and learning activity, through creating various learning activities teachers are able to make students participate in various learning experience. For that reason, the benefits of scientific process skills (SPS) are making students to be active, creative, and competent in academics. With those skills, students are able to develop their mindset which will also increase their academic result. Scientific process skills (SPS) is all of skills which are used to discover as well as develop science with scientific method. Scientific process skills (SPS) Involves cognitive and intellectual skills, as well as manual and social. Cognitive skill is involved because students use the process skill through their mind. Manual skill is involved in process skill because of the utilization of materials and tools. Social skill depends on the interaction between fellow students in the teaching and learning activities with process skill, by Rustaman in [1]. By Dahar in [2] inquired scientific process skills are the skill of students to implement a scientific method to understand, develop, and discover a knowledge. Scientific skill is very important to students who will implement scientific method in developing scientific knowledge as well as to obtain new knowledge or develop a previously gained knowledge. Based on the statements above, scientific process skills is all of skills which are used to discover and develop science with scientific method which includes cognitive and intellectual skills, as
well as social and manual skills using systematical steps in order to solve the problem and develop a scientific product. Bryce, et al. in [3] stated, scientific process skills consist of basic skills which include: (a) skill in observation, (b) skill in taking note, (c) skill in measuring, (d) skill in implementing the procedures, (e) skill in following instructions. Processing skills which include: (a) skill in inference, and (b) skill in selecting methods or procedures. Integrated investigation skills which include: (a) planning investigation, (b) conducting investigation, (c) reporting the result of investigation. Basic skills according to Rezba in [4] include of observing, classifying, predicting, measuring, inferring, and communicating. Integrated skills include of identifying variables, hypothesizing, analytical investigation, tabulation and chart, selecting variables, investigating, and conducting experiment. On the other hand, by Rustaman in [1], mentioned that scientific process skills consist of nine skills which are, observation, interpretation, clarification, prediction, communication, hypothesizing, planning on investigation, implementing principles and concepts, and asking questions. Based on the definitions of scientific process skills above, scientific process skills in this research is described as the whole of thinking process (minds-on) and procedural activities (hands-on) which have been performed by students in constructing their scientific knowledge which is covering their intellectual process skill and manual process skill. In this research, the writer was not fully adopting the types of scientific process skills according to Rustaman [1]. On the other hand, some of the scientific process skills were reduced and adjusted with learning materials that were used in this research. Rustaman’s scientific process skills were reduced and then, selected based on scientific process which includes the students’ thinking process (minds-on). This research is focused on the intellectual skill which includes students’ thinking process (minds-on), synthesized and modified from Rustaman, including: observing, classifying, interpreting, predicting, implementing concept, hypothesizing, and communicating.

Logically the popularity of school based on students’ preference in a public eyes usually can be seen from the percentage of new graduates and the destination of the new graduates after they graduated from that school, especially to the same higher level and famous high schools or universities. Aside from that, school which preferred by students usually has better modern facilities which are believed to be able to increase the performance of the students which are not always possessed by other schools. Achievements which have been succeeded by their students or some specialists which have only been obtained by vocational schools, by Kurniawan in [5]. According to Martono in [6], students who have been accepted in a favorite school have been previously selected with a set of tests. Therefore, the quality of the prospective students has been maintained. by Subali in [7]. Mentioned that the level of students’ preference school is based on the result of National Exam needed by prospective students to be accepted in that school and the amounts of the new graduates of that school are accepted in State University. The result of research by Dogaru and Neacsu in [8] stated that the grouping of level of students’ preference school is not only based on public opinion, but also can be seen from the principles developed by the school itself.

The classification of school which is preferred among students can also be based on the national examination result of prospective students. Prospective students from the schools that have the highest National Exam scores (compared to other schools) means that the school is a students-preferred school because of its’ popularity among students who have a high national exam score. Which also can be interpreted as school with high favorite level. Whereas schools that have the lowest National Exam scores are said to be schools with a low favorite level. Based on various descriptions of the level of student’ preference school that have been described above, the basis for classifying the level that is used in the study is based on the variation of national examination scores for the school year 2015/2016. Students’ preferred school is divided into 4 categories namely Very Favorites, Favorites, Not Favorites and Less Favorites.

The learning process in state high school Bantul grade 10 has not fully utilized scientific process skills (SPS). The learning process mainly still centered on the teacher. For that reason, scientific process skills in state high school Bantul tends to be low or less. Scientific process skill for the students in the 2013 curriculum should be able to develop scientific attitudes and critical attitudes through scientific
steps. This is due to the different human resources in each school. In the scientific process skills approach, students can develop scientific attitudes and critical attitudes through scientific steps. One of the problems in our education world is the frailness of the learning process. A lot of students cannot develop their understanding of a certain concepts, because of the acquisition and the process is not integrated and does not allow students to capture meaning flexibly. The learning process in state high school Bantul has not been able to develop scientific process skill. The application in learning should be identical with the development of scientific process skills within the students. This is caused by the teacher-centered learning process and students are passively following the learning activity.

The scope of this study is generally limited in grade 10 of state high school in Bantul, Indonesia. The school has met with the criteria that is, the school has implemented the 2013 Curriculum and the research focused on scientific process skills of students grade 10 in state high school Bantul on learning material with a theme: Ecosystem. The formulation of the problem in this study is how the profile of scientific process skill students in the state high school Bantul in the aspect of observing, classifying, interpreting, predicting, applying concepts, hypothesizing, and communicating. Also, whether the students’ preference level in the school influences grade 10 student’s scientific process skill profile in subject Biology curriculum 2013 at state high school. This study is aimed to determine the scientific skill profile in state high school Bantul on the aspects of observing, classifying, interpreting, predicting, applying concepts, hypothesizing, and communicating and to find out the level of students’ preference in the school influences the grade 10 students' scientific process skill profile in subject Biology curriculum of 2013 in state high school Bantul.

The rest of this paper is organized as follow: Section 2 describes the proposed research method. Section 3 presents the obtained results and following by discussion. Finally Section 4 concludes this work.

2. Research Method

This research is a descriptive study. The description the ability of students' scientific process skills in Bantul and also discover whether the profile of scientific process skills is influenced by the level students’ reference toward the school. The research was held in April-May 2017. The population of this study is a state high school in Bantul Regency which has become a pilot project and has implemented the curriculum of 2013 starting in 2013/2014, with total 4 state high school in Bantul Regency. This study involved a sample of 339 students from 846 high school students in Bantul Regency in 2017. The independent variable in this study is the level of students’ preference towards the school and the dependent variable in this study is the scientific process skills of the students. Data collection techniques used in this study are using a written test that is used to measure some aspects of scientific process skills of the students with the research instrument in a form of descriptive problems/questions. The documentation is also used to discover the level of students’ preference toward the school. Written test is done at the end lesson or at the end ecosystem material. After that, the instrument was standardized to find out the validity and reliability of the questions/problems using the Kappa coefficient and item sensitivity index. The logical validity of the test instrument for measuring science process skills is fulfilled based on the fulfillment of the criteria for content validity and construct validity. After the fulfillment of logical validity, the test instrument for understanding concept comprehension is tested for face validity by asking for a review from an expert consisting of one Yogyakarta State University lecturer. The reliability of the test instrument measuring scientific process skills based on the Cohen's kappa coefficient value is 0.204. This means that there is a decent or less than moderate agreement between assessor 1 and assessor 2 on the evaluation of the scientific process skills test questions. Data presentation uses qualitative method in the form of descriptive and quantitative analysis in the form of inferential statistic analysis. Data from the documentation of students’ preference toward school from the national examination result will be analyzed using data analysis techniques with t test.
3. Result and Discussion
This section presents the results obtained and following by discussion.

3.1 Profile of students' scientific process skills in state high school Bantul
This study was conducted in 4 schools that have used the Curriculum of 2013 at the Bantul Regency state high school, 7 indicators of scientific process skills, namely: observing, classifying, interpreting, predicting, applying concepts, hypothesizing, and communicating were being observed. Data from the seven indicators of the scientific process skills were obtained from the results of written tests at each school. After the data is processed, then the results of the average scientific process skills of the grade 10 students in Science major which were taken from the results of written tests of state high school in Bantul Regency can be seen in Table 1.

| No | State high school | Result of scientific skill test |
|----|-------------------|-------------------------------|
| 1  | A                 | 6.49                          |
| 2  | B                 | 6.55                          |
| 3  | C                 | 6.60                          |
| 4  | D                 | 5.90                          |

General average of scientific process skills (SPS) in state high school Bantul

Table 1 above shows the average scientific process skills (SPS) of all state high school Bantul is 6.38. The average shows that the scientific process skill in state high school Bantul is very good. When observed from each school, the highest average scientific process skill that was taken from written test result, namely state high school C with an average scientific process skills (SPS) of 6,60 while the lowest average scientific process skills was state high school D with an average of 5,90.

| State high school | Observing | Classifying | Interpreting | Predicting | Applying Concepts | Hypothesizing | Communicating |
|-------------------|-----------|-------------|--------------|------------|-------------------|---------------|---------------|
| A                 | 7.40      | 6.36        | 6.42         | 5.97       | 6.35              | 6.15          | 6.48          |
| B                 | 7.38      | 6.86        | 6.56         | 6.37       | 5.90              | 6.35          | 6.57          |
| C                 | 7.09      | 6.73        | 6.14         | 6.61       | 6.59              | 6.24          | 6.84          |
| D                 | 7.10      | 6.65        | 5.18         | 6          | 4.86              | 6.06          | 5.63          |
| Average           | 7.26      | 6.67        | 6.18         | 6.28       | 6.02              | 6.35          | 6.46          |

Table 2 above shows the average science process skills (SPS) in state high school in Bantul grade 10 students from Science Major on every aspect of scientific process skills. Based on the results of
research conducted in four schools, the overall average student scores varied. In general, the skills for observing and classifying develop very well compared to other types of the aspects. Although other types of scientific process skills such as interpreting, predicting, applying concepts, communicating, and hypothesizing have been experienced by students in their daily lives and developed in the learning process has been well developed, they are not as fast as the skill to observe and classify. This result is in accordance with the opinion of by Astuti in [9] who states that scientific process skills can be formed by habits that are carried out and practiced continuously. The role of the teacher in giving direction to students and the application of inquiry learning is very large for improving the mastery of scientific process skills. By Juhji in [10] states that scientific process skills should be familiarized as the students need to learn more on their own so that they can find concepts, scientific principles, and develop creativity in solving scientific problems which in practice are guided intensively by teachers.

3.2 Level of Students’ Preference towards state high school in Bantul year 2016/2017

Data regarding the level of students’ preference toward school is obtained from the national exam scores of prospective students in each school in 2017. The National Examination score used to indicate the level of students’ preference towards the school is the lowest national exam score which is admissible in each school. After the data is processed, the level of students’ preference toward school can be seen in Table 3.

Table 3. Level of Students’ Preference towards state high school in Bantul Regency year 2016/2017

| No | State high school | Lowest national exam score | Category of School |
|----|-------------------|---------------------------|-------------------|
| 1  | A                 | 365,00                    | Very Favorite     |
| 2  | B                 | 356,00                    | Very Favorite     |
| 3  | C                 | 322,00                    | Very Favorite     |
| 4  | D                 | 230,00                    | Non-Favorite      |

Table 3 above shows the level of students’ preference towards the schools known from 4 state high school in Bantul Regency. There are 3 schools that are in the very favorite category and 1 school is in the category of not favorite. The results of the normality test used the Kolmogorov-Smirnov test for teacher’s teaching time with a significance level of 0.05, the results were normal. After the results were being analyzed using SPSS the results of the t test showed that the sig value of 0.046 was smaller than 0.05. This result shows that there is a significant difference in the level students’ preference between very favorite schools and non-favorite schools. The level of students’ preference towards the school will also show the difference in the potential of participants in each school which is possible to be a factor in scientific process skills at school. Level of students’ preference towards the school becomes one of the factors that is influencing students to learn and understand the concepts that will be the purpose in learning science, and at the same time, developing basic scientific process skills. The level of students’ preference toward school influences the way teachers actualize scientific process skills in Biology learning. Teachers in favorite schools are better at actualizing scientific process skills compared to teachers in non-favorite schools. This result is likely because of the difference of students’ potential between favorite schools and non-favorite schools. As it also influences the way teachers teach including the way teachers actualize scientific process skills in the learning process.
4. Conclusion

Based on the data from the data analysis and discussion, it can be concluded that the profile of scientific process skills’ (SPS) competency ability of the students of state high school in Bantul Regency is very good and the level of students’ preference towards the favorite school level affects the ability of scientific process skills in learning process of Biology as the subject.

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