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# THE EFFECT OF SCIENCE LEARNING BASED ON AN INTEGRATED SCIENTIFIC APPROACH TO LOCAL POTENTIAL ON THE SCIENCE PROCESS SKILL OF THE STUDENT

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## Abstract

The present study aims to analyze the aftermath of science learning based on an integrated scientific approach to local potential, onion agriculture, towards the science process skill of 7th grade of junior high school students. The study was a quasi-experimental research with non-equivalent control group design. The object of this experiment was all classes in the 7th grade of Wedarijaksa 2 junior high school. Cluster random sampling was used to gather the sample, as the result, two of seven classes were randomly chosen. Data used in the research were the result of science process skill test. Data were analyzed using One-way Anova. The result shows that there is a significant impact of science learning based on scientific approach to local potential, in this case is onion agriculture, towards process science skill of the students.


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## INTRODUCTION

The implementation of local integration curriculum is regulated based on Regulation of Ministry of Education and Culture in Indonesia Number 81 A year 2013. Local subject can be executed as individual subject or integrated to other subject or as an extracurricular (Menteri Pendidikan dan Kebudayaan , 2013). Science is relevant to be integrated with local subject. But in fact this subject has never been related to local potentials around the schools.

Local potential is the local resource which is specifically owned by the certain area. One of the potentials in Pati regency is red onion. Red onion can be used as the extension in learning materials. This potential is never being used in as Natural science material.

Learning is an interaction between students and teacher. Students are required to be active in learning process. They will be active in science if there is an alternative of the materials. One of the alternatives to improve students' activeness is scientific approach.

Scientific approach can be integrated to contextual learning source around students, like farming product (Setiawan, D., & Insih Wilujeng, 2016). This approach has methods with several steps including formulating problems, hypothesis, data management, concluding, and communicating. Scientific approach in learning process includes digging information through adapting, asking, experimenting, and processing data or information. It is continued with analysis, elaboration, conclusion, and discoveries (Ariyanti, 2014). Scientific approach is an ability obtained through observing, asking, experimenting, elaborating, presenting, and discovering (Khasanah, K., Ngazizah, N., & Kurniawan, E. S., 2014). The integration of red onion in scientific approach material includes observation, collecting information to solve problems, associating information, and communicating information. Science can be learned with activities inside and outside of the classroom (Setiawan, D. & Wilujeng, I., 2015).

Learning process implementing scientific approach consists of three things, knowledge (cognitive), behavior (affective), and skills (psychomotor). The Scientific approach in this research invites students to follow science learning in several activities, including observation, asking, collecting information, associating information, and communicating.

The science is related to local potentials of red onion using a scientific approach. The potentials of red onion can enhance the learning process and make the students be more active. It makes learning process becomes more meaningful to students if teachers can integrate it to science subject. Ideally, science requires students to learn about science processing skills, such as observation, measurement, grouping, prediction, concluding, and communication.

Based on the initial observation in SMP (Middle School) Negeri 2 Wedarijaksa in 25$^{th}$ July 2016, science processing skills, like observation, prediction, and communication, did not appear in the learning process. This fact showed that students should improve science processing skills. Students were still unable to get a chance of practicing the skills optimally.

Science processing skills are the ground to complex science (Settlage, J. & Sotherland, S.A., 2012). These skills are important to develop scientific method and science in general (Malik, A., Wahyuni H., & Ranny N., 2015). The skills are skills which can prepare students to do many physical activities during discovering, thinking, and inserting scientific behavior in them (Ermininingsih, Sudarisman, S., & Suparmi, 2013).

These are the tools to produce and conduct science, scientific research, and problem-solving (Aktamis, Hilal & Ergin, Omer, 2008). Science processing skills include understanding problems, formulating a hypothesis, planning experiment, proving hypothesis, collecting data, and concluding (Erina R. & Kuswanto, H., 2015). The skills are also known as observation, formulating a hypothesis, prediction, choosing and controlling variables, making an operational definition, conducting experiments, collecting data, measuring, grouping, figuring charts and picture, analyzing data, inferencing, designing model, and communicating (Sherman S.J. & Sherman, R.S., 2004).

Science process skills in this research are doing a scientific investigation. The investigation includes several indicators, including observation, measurement, prediction, concluding, and communication.

Science with scientific approach has some factors consisting of observation, asking,

collecting information, associating information, and communicating. Students are given chances to train themselves enhancing these indicators. Science processing skills which can be trained to students are observation, measurement, grouping, prediction, concluding, and communication. The indicators of observation and communication can be trained to students through science processing skills. Collecting information can be trained by measuring and grouping. Meanwhile, associating information can be trained through predicting, and concluding. Nonetheless asking cannot be trained in science processing skills.

The problems which is raised here is the influence of science learning with scientific approach integrated to local potentials (red onion) to VII grade students' science processing skills. The purpose is analyzing the influence of science learning with scientific approach integrated to local potentials (red onion) to VII grade students' science processing skills. The significance of this research is improving students' science processing skills.

## METHOD

This research was a quasi-experimental with non-equivalent control group design. This research was done in SMP Negeri 2 Wedarijaksa. It was conducted in November to December 2016 in odd terms for the academic year of 2016/2017.

The population of this research was all VII grade students of SMP Negeri 2 Wedarijaksa consist of 7 classes. The sampling of this research used cluster random sampling. In accordance to the framework, two of seven classes were chosen randomly. Then, one from both class was chosen as experiment class with local potentials (red onion) integration to scientific approach treatment in science subject while other class played as control class with conventional learning. This research used three variables: independent variable (the treatment and conventional method), dependent variable (science processing skills), and control variable (teachers and materials).

This research began in July 2016 to November 2016 in schedules of (1) initial observation, (2) proposal seminar, (3) instrument analysis, (4) instrument validation, and (5) research permission. In November 2016 to December 2016 the schedules were (1) pretest, (2) doing the learning process in two classes, and (3) posttest.

The collected data was students' learning results (tests). The tests used to obtain data regarding students' science process skills. The tests were given in multiple choice test sheets.

The data analysis used descriptive analysis and inferential analysis with SPSS version 21. Descriptive analysis was used to deliver data of science processing skills in experimental class (local potentials (red onion) integration to scientific approach treatment in science subject) and control class (conventional learning) from pretest and posttest score. The data of science processing skills in this research included the mean, median, modus, deviation standard, maximum score, and minimum score.

Besides descriptive analysis, there was also inferential technique. The technique in this research used One-Way Anova Test. One-Way Anova Test was used to tests the data obtained from process skills in experiment class and control class.

Before doing One-Way Anova Test, there was a prerequisite tests of normality test and homogeneity test. The measured data were students' pretest. One-Way Anova Test was done to analyze the influence of local potentials (red onion) integration to scientific approach treatment in science subject. The measured data was students' posttest.

## RESULT AND DISCUSSION

The total result of pretest and posttest can be seen in Table 1 as follows.

**Table 1.** Descriptive Analysis of Students' Pretest and Posttest

| Description | Control Class (n=28) | | Experiment Class (n=28) | |
|---|---|---|---|---|
| | *Pre-test* | *Post-test* | *Pre-test* | *Post-test* |
| Mean | 36.96 | 68.04 | 38.04 | 78.39 |
| Median | 35 | 65 | 40 | 77.5 |
| Modus | 30 | 65 | 40 | 75 |
| Deviation Standard | 12.27 | 7.49 | 11.25 | 12.98 |
| Maximum Score | 55 | 90 | 60 | 100 |
| Minimum Score | 15 | 60 | 20 | 55 |

Table 1 shows that the average score of experimental class (38.04) was higher than control class (36.96), and the average score of students' posttest score in experiment class (78.39) was higher than control class (68.04). The maximum score of the pretest class in the experiment class (60) was higher than control

class (55). The maximum score of the posttest in experiment class (100) was higher than control class (90). The minimum score of pretest in the experiment class (20) was also higher than control class (15). The minimum score of posttest in the experiment class (55) was smaller than the control class (60).

Before doing One-Way Anova Test, there was a prerequisite test, normality test and homogeneity test. The result of normality test used the pretest score was delivered in Table 2.

**Table 2**. Normality Test

| Class | Kolmogorov-Smirnov | |
|---|---|---|
| | Df | Sig. |
| Control Class | 28 | 0.147 |
| Experiment Class | 28 | 0.200 |

Table 2 shows that normality test of Kolmogorov-Smirnov can conclude the significant score of control class (0.147) and experiment class (0.200). It means the significance > 0.05. Therefore, the skills was normally distributed. The result of homogeneity tests used the pretests of science processing skills is delivered as follows in table 3.

**Table 3.** Homogeneity test

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 0.548 | 1 | 54 | 0.462 |

Table 3 shows than the significance in homogeneity test was 0.462. It means that the significance > 0.05. Thus, it can be concluded that science processing data has the same variance.

The result of One-Way Anova Test using posttest score to both class is presented in Table 4.

**Table 4.** One Way Anova Test: Science Process Skill

| Variable | F | Sig | Note |
|---|---|---|---|
| Science Processing Skills | 13.361 | 0.001 | Influential |

Table 4 shows that the significance was 0.001. It means that the significance < 0,05; thereby $H_0$ was rejected. Therefore, it can be concluded that there was an influence of science learning based on scientific approach integrated to local potentials (red onion) in improving students' science processing skills. This is in line with Myers and Dyer (2004) finding that shows agriculture education can enhance integrated science process skill test. Another finding also states the same implication, Mabie and Baker (1996) say that students' involvement in agriculturally-oriented experiment activities positively impacts the development of science process skills.

## CONCLUSION

The result and discussion can be concluded as there was a significant influence of science learning based on scientific approach integrated to local potentials (red onion) in improving VII grade students' science processing skills.

The suggestion proposed was teachers can use science learning based on scientific approach integrated to local potentials (red onion) in improving students' science processing skills. It can also be used as innovation in learning process or to measure other variables.

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