The Impact of Natural Science Contextual Teaching through Project Method Reviewed From Analytical Skill to Students’ Achievement in MTs-N Miri Sragen

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ABSTRACT

The aims of this research are to describe the impact of the interaction between teaching method and students’ analytical skill to students’ achievement. The populations are the students of VII class of MTsNNegeriMiri on the teaching period of 2016/2017. This research used Cluster Random Sampling technique as the method to collect the sample. This research was designed using contextual teaching through project method, which teaching method as an independent variable and analytical skill as moderator independent variable. Based on the analysis, it can be concluded that: there is an interaction between teaching method and analytical skill to students’ achievement with the value *F*<sub>abs</sub>=5,549 and the significant number 4,04 (*p*<0,05). Based on the founding, contextual teaching through the project is one of the methods that give positive impact to increase students’ achievement on a natural science lesson. The increasing of students’ analytical skill is due to the transparency in problem delivering and the responsibility given to a student to search for the solution through a project.

KEY WORDS: Contextual teaching, project method, analytical skill.

INTRODUCTION

The development of Indonesian curriculum on 2013 for natural science was heading toward the concept of integrative science learning process. 2013 curriculum of natural science for junior high school contains description and competence expected to be achieved after the learning process. To accomplish the objective contained in the curriculum, a teacher shall create appropriate learning condition with the students’ character presented on teaching model including learning sources and supporting media.
A meaningful natural science teaching process is expected to increase education quality in Indonesia. It is based on the fact that natural science teaching process is still result oriented on achieving national examination score (Asih et al., 2015).

National Science Teaching association (2003) states that natural science teaching at class shall give direct experience to develop competence, so that students can explore and understand the surrounding nature scientifically. Scientific knowledge continues to develop explanation of statements validate by scientists, however only a few part of it can be delivered at school.

Natural science teaching shall give learning experience developing logical thinking skill, planning and conducting scientific research using knowledge which have already been learn to understand natural symptom and change happening at surrounding (Rustaman, 2008).

As one of the types of knowledge, natural science is formulated from interrelation of scientific process and attitude, scientific product, and natural phenomenon research. The interrelation is cyclic and affecting each other (Subiantoro, 2009).

According to Ausubel in Ango (2002), there are two types of learning process, they are describing and memorizing. Science is a constructive learning because it is focus on phenomenon assimilation and association, therefore students’ knowledge must be renewed and constructed continually. M. Nur (Murniati et al., 2012) states that to accomplish curriculum’s objectives, government try to increase teaching quality by adopting various approaches. One of the suggested approaches is contextual teaching and learning. Warta (2008) explains more that contextual teaching and learning is done by using early students’ experience on learning natural science to help them constructing lesson material, so as increasing students’ active participation during teaching process. Contextual teaching is based on John Dewey research concluding that students will study well if what they are studying is related to what they already know well or what is happening at surrounding (Rosydah, 2008). This teaching is focusing on high thinking capacity, knowledge transfer, data collection and analysis, certain problem solving individually or as a group (Khusniati, 2012).

Project based teaching model is chosen because it involves students on complex problems, real world problems, where students can choose and decide problems valuable for them. Besides, it requires students to investigate, plan research, and solve problem to finish the project (Muliawati, 2010). Project based teaching method is also beneficial and effective. According to Adnyawati (2011), through project, students are motivated to be more active in learning and to develop their creativity, while teacher only act as facilitator and evaluator for the project result.

On his research, Thomas (2000) concludes that by using project based learning method, students’ achievement increase to 26% compare to control school. There is also significant increase on problem solving skill between pretest and posttest for experiment class using project based learning. The method can increase students’ motivation and give certain picture on each level (Doppel, 2003).

By project method, students not only can build concept through problem solving, but also can result product so that they can be active in learning seen from process quality and result quality. Therefore, the aims of this research are to identify process quality measured from students’ activities such as visual activities, oral activities, listening activities, writing activities, motor activities, mental activities, emotional activities, and to identify result quality including students’ achievement of cognitive, affective, and
psychomotor (Istiqomah, 2014).

Natural science teaching shall focus on how children learn and not just what the student learn. Therefore, in accordance with constructivism view, the point of natural science teaching is starting from what the students have already known (Sajidan et.al, 2017).

Therefore, teachers need to have competence on their field. Besides, in order to create interesting teaching for students, teachers shall modify teaching method as varies as possible. Learning result interprets as level of understanding reached by students in following teaching and learning process appropriate with decided education program. Students’ learning result can be seen through class assessment. Class assessment is collecting process and information usage to give decision to students’ learning result. By the level of learning development, students’ portrait and profile of skill can be identified according to competence decided by curriculum. Beside the decided teaching method, teaching method also affect the increasing of students’ achievement.

Based on above problem, this research is intended to describe the influence of interaction between teaching method and analytical skill to students’ achievement.

**Major Heading**

Contextual teaching and learning (CTL) is an approach connecting material subject (content) and intellectual skill of students in appropriate situation and condition with students’ cognitive psychology and environment’s need (Komalasari, 2009).

CTL approach is a teaching approach connecting lesson’s content and students’ surrounding environment or students’ real world to create meaningful learning. It is because students’ understand that the lesson in class will be beneficial for their daily life. CTL with its various activities can create more interesting teaching for students so as can increase students’ motivation to study.

According to J. Mursell (Sugimal, 2006), project method has four aspects in its employment: 1) deciding aim, 2) planning, 3) conducting, 4) evaluating. Those four aspects are done to accomplish the project’s aim. Teaching using project method will result product which can be observed directly (real). Students compose report of their finding in written form or spoken or any other form in front of the class.

According to Bloom, knowledge and understanding are classified as an important low level of thinking skill in learning process, while analysis, synthesis, and evaluation are classified as high level of thinking skill (Teare, 2005).

According to Hardian (2010), analytical skill is students’ skill to explain or to differentiate things to each part and to find relation between each part. It is strengthen by Wiyarsi and Partana’s (2009) finding that project based teaching is quite effective to increase self independence aspect, group cooperation aspect, and psychomotor aspect.

Hamalik (2007) states that, learning result means the change of someone’s behavior, which its form of knowledge, attitude, and skill can be observed and measured. The change can be seen as the increasing and developing to be better than before, from not knowing to knowing.

**Sub-Heading**

Natural science material given at school by curriculum designer is usually introduced relatively in a great order of continuity as preparation for the next level of lesson. The aim of natural science teaching as this product is to develop conceptual understanding of students to natural science. The content of teaching includes various
facts, concepts, principles, natural laws, models, and theories formulate formal knowledge (Sitiet.al. 2014).

The deciding of approach in natural science teaching is based on: 1) the aim of the teaching, 2) the characteristic of material which will be learn by students, 3) the characteristic of students, 4) the learning experienced which will be achieved by students, 5) the life skill of students, and 6) the expected character after the teaching process. Natural science material has factual, procedural, conceptual, and meta-cognitive knowledge dimension. Factual knowledge of natural science is for instance the concept of force, work, energy, acid and alkali, substance change, and excretion system. Those concepts have certain characteristic required certain approach to deliver them to students so that is understandable.

Each student has each learning character. One of them may be auditory, visually, or kinesthetic. A visually oriented student will feel it difficult to understand spoken explanation. An auditory student will prefer listening to spoken explanation. A student who is taking note diligently and nodding his or her head when teacher is explaining does not mean he or she understand the material. A kinesthetic student is learning while playing a pencil. Teaching approach shall teach student as individual although the teaching process is done in group. Based on above explanation, the writer uses substance change material for this research.

METHODS

This research used experiment method. Teaching method is as independent variable, while students’ analytical skill is as independent moderator. The dependent variable is students’ achievement. The population of this research is students of VII class of MTsNNegeriMiri, Sragen, Jawa Tengah on the teaching period of 2016/2017. The cluster random sampling technique was used to collect the sample for this research. To decide whether there is sample equivalent between experiment group and control group, an equivalent test was done using data from documentation of the previous material test. The test statistic used was t-test. Based on the average score of previous daily test, it can be concluded that the experiment and the control group have quite the same skill. The technique of data collection used was instrument test technique consisting of natural science learning achievement test and students’ analytical skill test. A validity and reliability test was needed before the instruments are being used. The test between subjects was done to significant numbers from $F_{obs}$ with significant number greater that $F_t$ so that $H_0$ is rejected which means there is interaction between contextual teaching through project with analytical skill to learning achievement.

RESULTS AND DISCUSSION

Data of students’ analytical skill is grouped into two categories, they are high analytical skill and low analytical skill. The amounts of students who were given contextual teaching through project method and have high level of analytical skill are 14 students (56%). It is fewer than the amounts of students who were given contextual teaching through experiment method and have high level analytical skill, those are 16 students (64%). The amounts of students who were given contextual teaching through project method and have low level of analytical skill are 11 students (44%). It is greater than the amounts of students who were given contextual teaching through experiment
method and have low level analytical skill, those are 9 students (36%).

The average score of cognitive achievement of students’ who were given contextual teaching through project method and have high level of analytical skill is 83,183, while the average score of cognitive achievement of students’ who were given contextual teaching through experiment method and have high level analytical skill is 67,250.

The average score of cognitive achievement of students’ who were given contextual teaching through project method and have low level of analytical skill is 71,333, while the average score of cognitive achievement of students’ who were given contextual teaching through experiment method and have low level analytical skill is 69,755. The interaction between project method and experiment method is presented in the table below:

![Table of data]

Figure 1.1 interaction between project method and experiment method with analytical skill to achievement

(Source : Sunarsih, 2017)

The graphic shows that there is a cut line. It marks an existence of interaction between project method and experiment method with a significant influence by high and low analytical skill.

Fobs of interaction of method and analytical skill = 5.549>4.04, therefore Ho (there is no interaction between method and creativity to knowledge achievement) is rejected. It means that there is interaction between method and analytical skill to knowledge achievement. It shows that there is interaction between contextual teaching and analytical skill in the teaching process of substance characteristic material to knowledge achievement.

In substance characteristic, students are expected to master the basic concept and the problem solving skill. Students with high level of analytical skill will understand the material better by solving problems. They will try hard to solve problems emerged in substance characteristic material.

CONCLUSION

There is interaction between contextual teaching through project method and experiment method with analytical skill to students’ achievement. Based on the hypothesis test, with the value Fobs is 5.549, because Fobs is greater than Ftable (4.04) which means there is interaction between project method and experiment method with high and low analytical skill. The average score of achievement of students’ who were given project method and have high level of analytical skill is 83,183, while they who
have low level of analytical skill is 71,333. The graphic shows that there is a cut line on the interaction between project method and experiment method with analytical skill to students’ achievement. It marks an existence of interaction between project method and experiment method with analytical skill.

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REFERENCES


