



Vol 9(2), 2020, 108-113 DOI: 10.23960/jppk.v9.i2.202010

Jurnal Pendidikan dan Pembelajaran Kimia

e-ISSN: 2714-9595 | p-ISSN 2302-1772

<http://jurnal.fkip.unila.ac.id/index.php/JPK/index>

Teachers' and Students' Perception about Creative Thinking Skills, Immersed Integrated Science Learning, and project-based Learning: A cow dung waste issue

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Received: July, 27th 2020

Accepted: August, 29th 2020

Online Published: August, 31th 2020

Abstract: The perception of science teachers and students on project-based immersed integrated science learning: A cow dung waste issue. This study aims to describe the perception of science teachers and students about creative thinking skills, immersed integrated science learning, and project-based learning of a cow dung waste issue. The survey method used in this study were interviews and questionnaire techniques. The interviews conducted with 7 science teachers respondents. The questionnaires distributed to 121 respondents of junior high school students in the Jati Agung Subdistrict. The results showed that 85.71% of teacher respondents did not know about immersed integrated model yet. They also have never implemented project-based learning, based on the students' questionnaires, the teachers only gave assignments to 74.07% of student respondents and did not provide real problem-solving. The environmental problem occurs in Jati Agung Subdistrict is a large number of cow dung that causes pollution on the environment around society's houses. As many as 71.43% of teacher respondents stated that they already knew about creative thinking. However, the creative thinking skills they knew are not relevant to the Torrance framework. Based on the results, teachers' and students' perceptions of integrated science learning, project-based learning, and creative thinking skills are not according to their nature.

Keywords: teachers' and students' perception, creative thinking skills, immersed integrated science learning, project-based learning, a cow dung issue

To cite this article :

Chansyanah Diawati, Noor Fadiawati, Kartini Herlina. (2020). The perception of science teachers and students on project-based immersed integrated science learning: A cow dung waste issue. *Jurnal Pendidikan dan Pembelajaran Kimia*, 9(2), 108-113. doi:10.23960/jpk.v9.i2.202010

INTRODUCTION

Peraturan Menteri Pendidikan Nasional Republik Indonesia No. 22 of 2006 and Standards for Science Teacher Preparation (NSTA; 2003) recommend that elementary and middle school science teachers teach science in an integrated manner. Through integrated science learning, students gain direct experience, so they can add strength to search, save, and apply the concepts they have learned. Students will train to discover for

themselves various concepts learned holistically, meaningfully, authentically, and actively. The way the packaging of learning experiences designed by the teacher is very influential on the meaningful experience for the students. A learning experience that shows the relationship between conceptual elements will make the learning process more effective. Conceptual links that studied in the relevant field of natural sciences will form cognitive schemes so that children gain the integrity of knowledge. The wholeness of natural science learning and the unanimity of views about life, the real world, and natural phenomena can only reflect through integrated learning (Depdiknas, 2006a).

One of the integrated models is immersed. The immersed integration model views the curriculum as a microscope that looks at the whole object through a lens of interest (Fogarty; 1991). This model designed so that each individual can integrate all data from each field of study following their interests. The teacher fosters students' interest through providing the challenges in the project. Students will seek and integrate all related information to complete the project. The immersed model can improve students' ability to solve problems in their environment (Lala, Prabowo, & Suryanti; 2018). The characteristics of the immersed approach correspond to the characteristics of the project-based learning model (PjBL).

Project-based learning (PjBL) allows students to use their knowledge to solve real problems in the form of projects (Bilgin, Karakuyu, & Ay. 2015). PjBL is contextual learning based on real problems, involving students in choosing topics, considering approaches, designing, solving problems, making decisions, providing opportunities to work relatively independently for a long time, and producing tangible products related to problems (Diawati, Liliyasi, Setiabudi, & Buchari, 2018; Albalushi & Al-Aamri, 2014). PjBL can increase the ability of higher-order thinking, such as creative, critical, and problem-solving skills (Bell, 2010; Kokotsaki, Menzies, & Wiggins, 2016; Widiyatmoko & Pamelasari, 2012).

Creative thinking is a skill to develop, discover, or create new constructive combinations through an inquiry process based on existing data, information, or elements, with different perspectives, which appear as manifestations of perceived problems, resulting in an idea/useful solutions (Diawati, Liliyasi, Setiabudi, & Buchari, 2017; Syahrir, 2016; Piaw, 2010; Yamin, Permanasari, Redjeki, & Sopandi, 2017). This skill can be developed by giving real-life problems through PjBL (Diawati, Liliyasi, Setiabudi, & Buchari, 2017). Al-Suleiman (2009) stated five indicators of creative thinking skills, namely fluency, flexibility, originality, elaboration, and evaluation. Through creative thinking, students are not only fixated on one opinion or idea, so students have alternative ways to deal with problems (Muhammad & Atmojo; 2018).

The real-life problem in the environment of Jati Agung Subdistrict is a large number of cow dung that causes pollution on the environment around society's houses. Meanwhile, cow dung can be used as a PjBL media in integrated science topics (Wuryastuti & Ni'mah; 2013). Learning based on cow dung processing projects requires various concepts, such as environmental pollution, biotechnology, and environmentally friendly technologies.

This article describes the perceptions of science teachers and students about integrated science learning that uses the problem of cow dung waste as a project in improving the creative thinking skills of junior high school students.

▪ RESEARCH METHOD

This research was conducted in three junior high schools in Jati Agung Subdistrict, South Lampung Regency, namely SMPN 1, SMPN 3, and SMP Al-Huda Jati Agung. The study method used was surveying. Data collection techniques are interviews and questionnaires. Interviews were conducted on 7 respondents of junior high school science teachers and questionnaires were distributed to 121 respondents of junior high school students in Jati Agung Subdistrict.

The data obtained were analyzed by classifying the data, tabulating data based on the classification made, and calculating the percentage of answers using the following formula:

$$%J_{in} = \frac{\sum J_i}{N} \times 100 \%$$

where, % J_{in} is the percentage of choice answer i , $\sum J_i$ is the number of respondents who answer the answer i , and N is the number of all respondents (Sudjana; 2005).

▪ RESULTS AND DISCUSSION

The results of interviews of junior high school science teachers in the Jati Agung Subdistrict are showed in Figure 1. Figure 1 described that all teacher respondents did not implement integrated science learning. The integration referred by the teachers was the integration of learning among the fields of biology, physics, and chemistry. The teachers had difficulty in teaching the integration of the three fields of study. It was because teacher respondents came from the background of monodisciplinary education, such as biology, physics, and chemistry only. All teacher respondents have never implemented an integrated model in science learning activities.

A total of 14.28% of teacher respondents already knew about the immersed integrated model. The rest about 85.71% of them did not know about this integrated model yet. Teachers who already knew about immersed integrated model have never been trained in this model, so they had never implemented it in science learning activities. Generally, the teachers had inserted the knowledge from one or more Kompetensi Dasar (KD) into a particular KD. However, teacher respondents did not know that the insertion of knowledge was included in the part of the integration model.

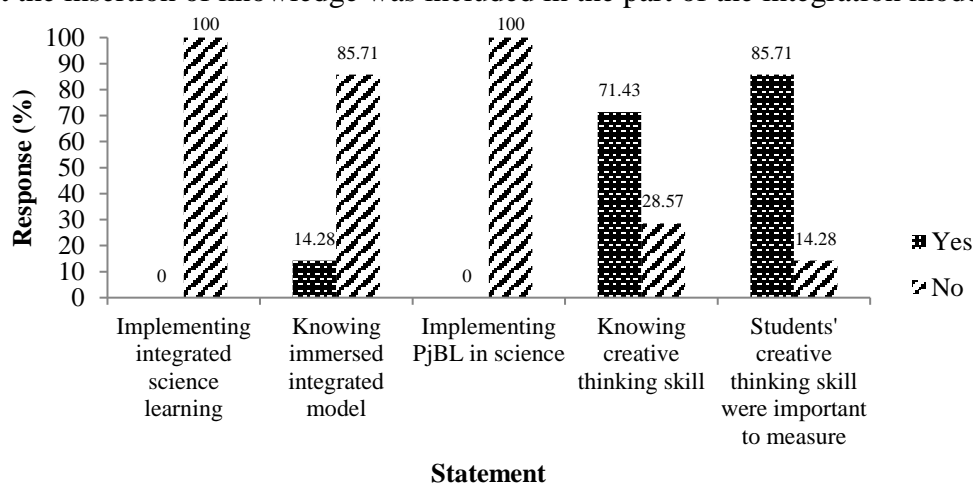


Figure 1. Science teachers' responses

All teacher respondents have never implemented PjBL. They only gave an assignment to students to do a project, such as making tapai. PjBL implemented by teachers was also not based on existing problems. Meanwhile, the problem occurs in Jati Agung Subdistrict is a large number of cow dung. The teachers never guided students to solve it. It showed that PjBL steps understood by the teachers were not what they should be.

As many as 71.43% of teacher respondents already knew about creative thinking skills. They stated that students were said to have thought creatively if students were able to find ideas, understand and analyze problems, and group the ideas. The indicators understood by the teacher were not what they should be. The Indicators of creative thinking skills according to Al-Suleiman (2009), namely fluency, flexibility, originality, elaboration, and evaluation.

Besides that, as many as 85.71% of teacher respondents stated that creative thinking skills needed to be measured. The rest, 14.28% of them stated that junior high school students' creative thinking skills were not important to measure. They assumed that this thinking skill was too high for middle school students. The results of filling out the questionnaire by 121 grade IX students in Jati Agung Subdistrict are showed in Figure 2 and Figure 3.

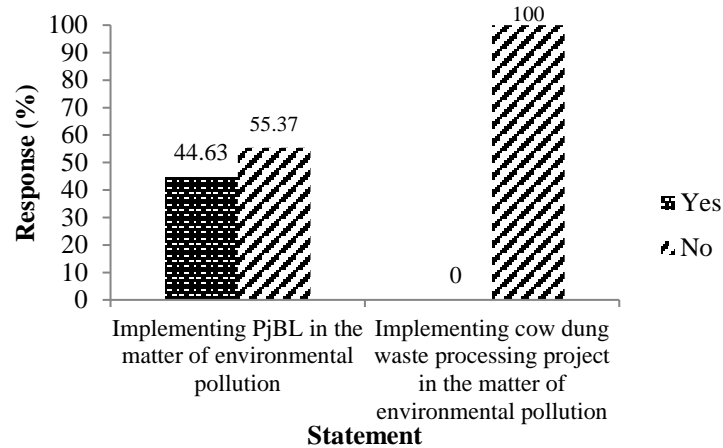


Figure 2. Junior high school students' responses

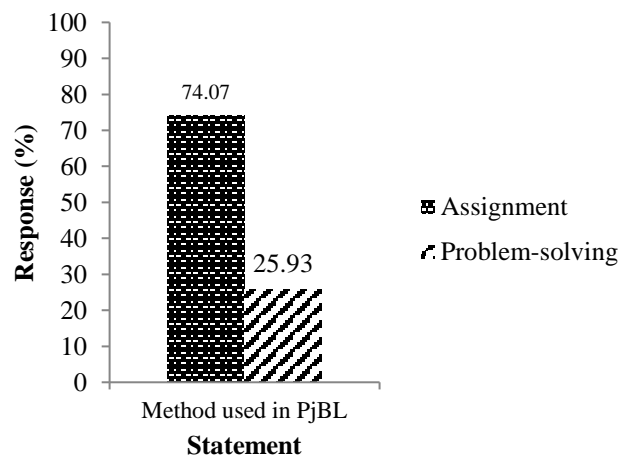


Figure 3. Students' responses on method used in PjBL

Based on Figure 2 and Figure 3, as many as 44.63% of the students did PjBL in the environmental pollution topic. Other student respondents have never implemented PjBL on this topic. Students who applied PjBL used assignments method as much as 74.07% and 25.93% used the problem-solving method. However, 100% of teachers have never studied in the form of cow dung processing projects. Meanwhile, the problem occurs in Jati Agung Subdistrict related to cow dung waste produced from society's farms.

▪ CONCLUSION

Based on the results and discussion, the perception of science teachers and junior high school students toward integrated science learning, PjBL, and creative thinking skills were not in accordance with their nature. As many as 85.71% of teachers did not know about immersed integrated model yet. They also have never implemented PjBL because based on the student questionnaire, the teacher only gave assignments to 74.07% of students and did not provide real problem-solving. The environmental problem occurs in Jati Agung Subdistrict is a large number of cow dung that causes pollution on the environment around society's houses. Out of 71.43%, teacher respondents stated that they already knew about creative thinking skills. However, the indicators were not what they should be.

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