
The Implementation of Problem-Based Learning Model and SETS Vision in Sadeng 03 Elementary School to Enhance 4th Grade Students' Activities and Learning Outcomes

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Abstract:Based on preliminary observation in Sadeng 03 Semarang elementary school has been found some challenges which needed to be overcome in the learning process, especially in 4th grade. Teacher has not implemented yet problem-based learning which is suggested by Regulation of Education and Culture Minister Number 22/ 2016 about Process Standard to be implemented in the learning process. Students tended to be passive learners and their learning outcomes were low. This was classroom action research which was divided into three cycles. This study aimed to enhance students' activities, and learning outcomes by applying problem-based learning model and science, environment, technology, society (SETS) Vision in the learning process. The samples of this research were 30 students of 4th grade. Data was derived from observation, test, field note, and documentation. Qualitative and quantitative description were used in this research. The results showed that implementation of PBL and SETS vision was effective to improve students' activities proved by the improvements of students' activities from 1st cycle (high category) to the 2nd and 3rd cycle (very high category). In addition, there were found improvements of students' learning outcomes in every cycle which showed by the increases of average scores from 60 (pre-cycle) to 80 (3rd cycle). In conclusion, the implementation of PBL and SETS vision was effective to level up the students' activities, and learning outcomes of 4th grade students of Sadeng 03 elementary school.

Keywords: Problem-based learning; SETS vision; Students' activities; Learning outcomes.

1. Introduction

The Regulation of Education and Culture Minister Number 22/ 2016, about Process Standard, has been issued as a way to encourage the achievement of national education goals. As a consequence, the learning process of every grade of elementary and secondary schools must be interactive, inspirational, joyful, challenging, and motivating students to participate actively. Its implication stimulates the change of education paradigm, from instruction paradigm to learning paradigm. Instruction paradigm is process to transfer knowledge from teacher to students, **while learning** paradigm perceives students as active learners to formulate, construct and discover the knowledge by their selves (Barr, 1995: 14). The regulation also demands the implementation of scientific and thematic approach in the learning process of elementary education. Thus, problem-based learning and inquiry-based learning are extensively suggested to be implemented

in the classroom to facilitate students actively participating as individual or groups, and constructing a contextual product of learning.

Another reason why it has been set out is because the student-centred learning has not been effectively enough applied in schools, especially in elementary school. According to Sanusi in Winataputra(2008), learning process in school tends to too focus on rote memorization, teacher-centred, and lacks of learning resources. As a result, the learning process can be boring, and uninteresting. In addition, Wade (2002:11), in his research, claims that 75% - 90% of learning times count on text books which make students passive and the concepts seem to be unfamiliar to them.

Based on preliminary observation in Sadeng 03 Semarang elementary school has been found some challenges which needed to be overcome in the learning process, especially in 4th grade students. Observation result showed that teacher still dominated the learning process (teacher-centred), use of learning model was still not appropriate with *Process Standard Regulation*. Generally, teacher still applied expository approach in the classroom, and counted on textbooks. Thus, students were passive and got bored in the class. Sadeng 03 Semarang elementary school has had many supporting tools, such as laptop, LCD, screen, and sound system; however, teachers have not utilized them effectively. Instead, they sometimes used only printed-pictures as media in the classroom. These cases cause students getting the low understanding level of materials and the low learning outcomes which proved by their level of achievement completeness based on daily exam results in the first semester 2017, there were only 16 students who passed the minimum criteria (KKM = 65), while 14 others did not pass it and the average score was 60. As consequence, it really needed to enhance the learning quality of 4th grade classroom, especially to improve students' activities and learning outcomes.

Related to the lack of students' activities, involvements, and understanding, Hmelo-Silver (2004:1) suggested the use of problem-based learning (PBL) model which facilitates students to learn through problem solving. In PBL, students are learning focus on complex problem which can be solved in different ways. They work in groups, identify, and study things that they need to overcome the problem. Teacher in PBL has very important role as facilitator of students in discussion and giving instruction to students to be independent learners so they can reach meaningful understanding (Mergendoller, et al., 2006). Flynn and Klein (2001:71), in their research, concluded that PBL could foster a more relevant and meaningful learning for students to actively participate, analyse, and discuss solving authentic and real problems. There are five phases of PBL implementation in the learning process, namely: 1) orient students to the problems; 2) organize students to study; 3) assist independent and group investigation; 4) develop and present artefacts and exhibits; and 5) analyse and evaluate the problem-solving process (Arrends, 2012: 411). In addition, to make the learning process more contextual, meaningful for students, and appropriate with thematic approach, it needs the implementation of SETS Vision. Learning through SETS Vision stresses the involvements of SETS' elements (Science, Environment, Technology, and Society) as an inseparable unity in the learning process (Binadja, 1996). SETS Vision colors person's point of view in seeing and understanding things in which everything is regarded having intertwined-involvement of SETS' elements which is clearer than thing which is not observed by SETS vision (Binadja, 1999). The implementation of PBL model and SETS vision in elementary school is regarded as a way to enhance the quality of learning in elementary school, especially in 4th grade of Sadeng 03 Elementary school.

This research aimed to enhance students’ activities, and learning outcomes by applying problem-based learning model and science, environment, technology, society (SETS) Vision in the learning process of 4th grade Sadeng 03 elementary school.

2. Methodology

This study was a classroom action research. It contains of 4 main steps in every cycle, namely: 1) planning, 2) action implementation, 3) observation, and 4) reflection (Arikunto, 2006:91). This study was conducted in 3 cycles. The samples of this research were 30fourth grade students of Sadeng 03 Semarang elementary school. Data collection was derived from observation, test, field note, and documentation. It consisted of 2 items, namely: 1) students’ learning outcomes (test) and 2) students’ activities.

3. Result and Discussion

3.1. Students’ activities

The data of students’ activities were derived from observation in the learning process of 4th grader students on material about *Energy* in which its theme was *Energy Saving* and its subtheme was *Alternative Energy*. The materials were taught in 3 meetings (3 cycles) in which each one had different indicators and specific learning goals. The indicators of students’ activities were 1) student’s readiness to learn; 2) student’s involvement in the learning process; 3) student’s ability to formulate a problem-solving idea; 4) student’s ability to access the sources of problem-solving; 5) student’s ability to discuss the problem solution; 6) student’s ability to communicate the solution to the class; 7) student’s ability to fill the worksheet; 8) student’s ability to question; 9) student’s ability to make a conclusion; 10) student’s ability to finish the exam.

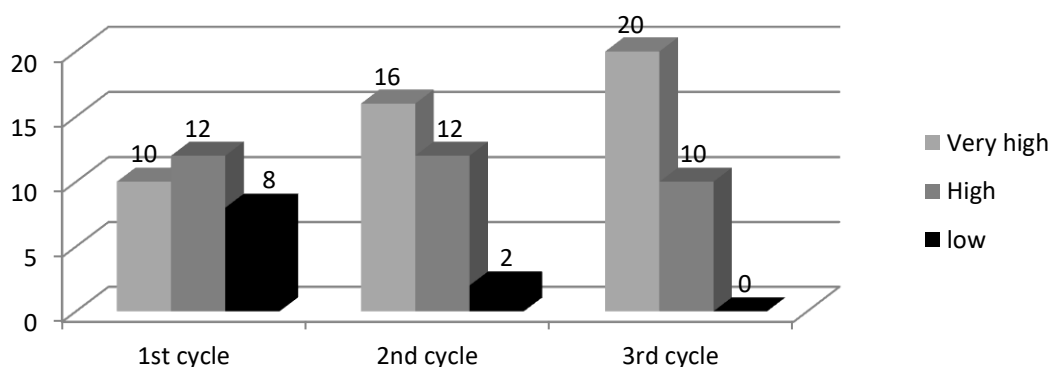


Figure 1. The improvement of students’ activities

Figure 1 showed the improvement of students’ activities related to the high level of activities shown by the students in the learning process. In the first cycle, there were 10 students who had very high category of activities while 12 others were included in high activity, and 8 students had low activities. It was caused by the lack of preparation that should have been done by the teacher. Students and teachers needed to adjust the PBL model syntax and SETS Vision.

Students tended to hesitate in formulating the problem-solving solution because they were afraid of doing mistake and some of them felt difficulties in formulating the solution related to SETS vision. They still felt afraid and shy to deliver their opinions because they used to count on textbook and listen to teacher’s explanation. In the first cycle, teachers posed the problem to students through picturesso some of students did not comprehend effectively the main problem to overcome. In the 2nd cycle, the number of students who had very high category increased to be 16 students, while 12 students had high activity, and students who had low activity decreased to be 2 students. Students gradually got adjusted with the implementation of PBL model and SETS Vision. They have understood the patterns of PBL and SETS vision. In this cycle, teachers posed the problem by using video so students can see and listen clearly about the main problem. In the problem-solving process, teachers gave card issues which contained SETS vision figure as tools for students to comprehend the problem and overcome the problem connected to SETS elements. Furthermore, in the 3rd cycle, the number of students who had very high activity increased to be 20, while 10 others had high activity. It was triggered by some reasons, such as: teacher gave instruction clearly to the students about the learning goals and what they had to do in the learning process. Students already got familiar with PBL model and SETS Vision and they have understood about the use of worksheet as tools for them to formulate the problem-solving idea while watching the video or reading the card issues, discuss, and to make a conclusion. The average score of students’ activities also showed improvements from 1st cycle to 3rd cycle as shown in Figure 2.

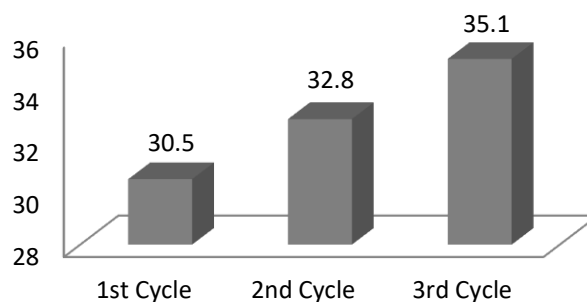


Figure 2. The average score of students’ activities

Based on Figure 2, It could be seen that in the 1st cycle, students’ activities average score was 30.5 which included in high category and it improved in 2nd cycle and 3rd cycle to be 32.8 and 35.1 respectively, which both included in very high category. Based on those improvements, it could be claimed that the implementation of PBL and SETS vision was effective to increase 4th grade the students’ activities of Sadeng03 elementary school. This result was in accordance with a research conducted by Tillman (2013), PBL students reported significantly higher levels of collaboration, meaning they worked with and helped their peers more than students in traditional, teacher, and worksheet focused instruction.

3.2. Students’ Learning Outcomes

Students learning outcomes were derived from test given to 4th grader students on material about *Energy* in which its theme was *Energy Saving* and its subtheme was *Alternative Energy*. The materials were taught in 3 meetings in which each one had different indicators and specific learning goals. The results showed improvements of students’ learning outcomes from 1st cycle to 3rd cycle as shown in Figure 3.

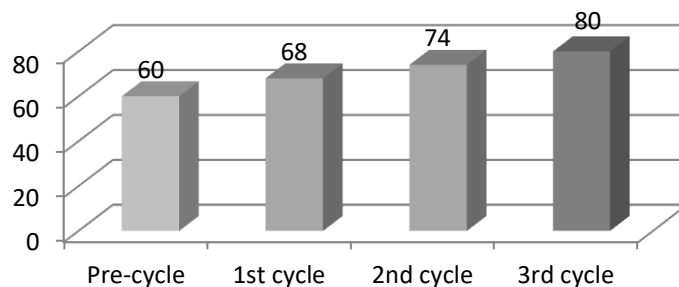


Figure 3. The Average Score Improvements of Students' Learning Outcomes

Figure 3 showed the improvements of average scores of students' learning outcomes from pre-cycle, before the implementation of PBL and SETS Vision, to 1st, 2nd, and 3rd cycle which have been applied PBL and SETS Vision. It could be seen that in the pre-cycle the average score was the lowest on (60) and it improved in 1st cycle (68), 2nd cycle (74), and in 3rd cycle, it had the highest improvement up to 80. It meant that the implementation of PBL and SETS vision could improve the average scores of 4th grade students' learning outcomes in Sadeng 03 elementary school. In addition, the number of students who passed the minimum criteria (KKM = 65) improved from the 1st cycle to the 3rd cycle as shown in **Figure 4**.

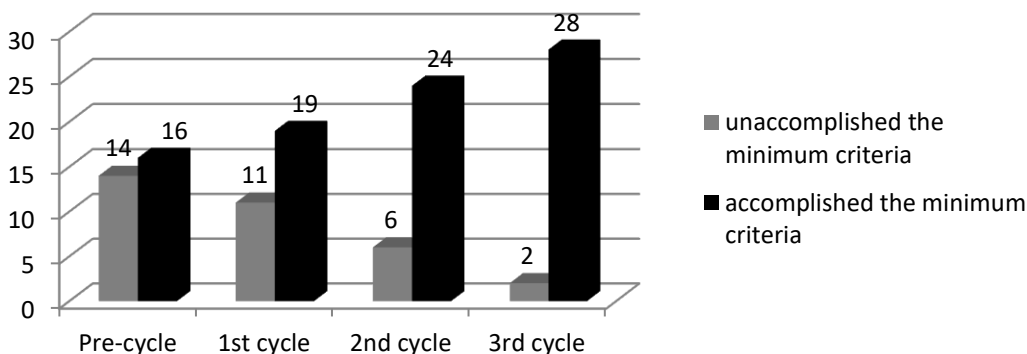


Figure 4. The Number of Students Who Accomplished the Minimum Criteria (KKM)

Figure 4 showed the number of students who passed and who did not pass the minimum criteria (KKM) started from pre-cycle to the 3rd cycle. It could be seen that the highest number of students who did not pass the KKM was in pre-cycle (14 students), and it gradually decreased in the 1st cycle (11 students), in the 2nd cycle (6 students), and finally there was only two students who did not pass the KKM in the 3rd cycle. On the other hand, the number of students who passed the KKM increased from only 16 students in the pre-cycle, which did not apply PBL and SETS vision, to be 19 students in the 2nd cycle, to be 24 students in the 3rd cycle, and finally in the 3rd cycle, 28 out of 30 students passed the KKM. As a result, it could be claimed that the implementation of PBL and SETS vision effectively enhanced the learning outcome of 4th grade students of Sadeng 03 elementary school. In the pre-cycle, teacher did not apply PBL model and SETS vision, instead teacher used only text book and simple pictures to teach materials to students. Its result was far beyond expectation there were only 16 out of 30 students who passed the minimum criteria (KKM) and the average score was only 60. On the other hand, started from the 1st cycle to the 3rd cycle, the condition changed because PBL model and SETS vision

were implemented in the learning process. 28 of 30 students passed the KKM in the 3rd cycle and the average score amounted to 80. This result was in accordance with a research conducted by Merrit, et al. (2017), PBL is an effective model for improving students' achievement, including knowledge retention, conceptual development, and attitudes. In addition, Rusilowati (2009) in her research showed that the implementation of SETS vision in the learning process can improve students' understanding and accomplishment.

4. Conclusion

The implementation of problem-based learning (PBL) model and SETS vision in learning process was effective to enhance 4th grade students' activities and learning outcomes in Sadeng 03 elementary school. Students' activities could be improved which proved by the improvements of their involvements in the learning process through formulating problem-solving idea, analyzing, discussing, sharing, and communicating the solution activities. Learning outcomes could be improved effectively which proved by the improvements of students' learning outcomes in every cycle which showed by the increases of average scores from 60 (pre-cycle) to 80 (3rd cycle). In conclusion, PBL and SETS vision were effective to level up the students' activities, and learning outcomes of 4th grade students of Sadeng 03 elementary school. In suggestion, hopefully PBL and SETS vision can be implemented in other grades of classrooms and these can be support by new technology such as android-based teaching.

References

- Arends, Richard I., 2012., Learning to Teach. New York: McGraw-Hill Companies, Inc.
- Arikunto, Suharsimi, 2006, Penelitian Tindakan Kelas. Jakarta: Bumi Aksara.
- Barr, R. B., & Tagg, J, 1995, From Teaching to Learning- A New Paradigm for Undergraduate Education. *Change*, 27(6), 12-25.
- Binadja, Achmad, 1996, Why Do We Need SETS Education? Paper Submitted for training and workshop on Environmental Education, Brisbane.
- Binadja, Achmad. 1999, STL (Science and Technology Literacy) in the SETS (Science, Environment, Technology, and Society Education) Perspective. Paper presented in the Regional Workshop on Scientific and Technological Literacy for All, Conducted by SEAMEO RECSAM In Collaboration with UNESCO and ICASE, Penang, 10 – 15 May 1999.
- Flynn AE, Klein JD, 2001, The influence of discussion groups in a case-based learning environment. *Educ Technol Res Dev* 49(3):71–86.
- Hmelo-Silver, Cindy E, 2004, Problem-Based Learning: What and How Do Students Learn. *Journal. Educational Psychology Review*, Vol. 16, No. 3, September 2004
- Mergendoller JR, Maxwell NL, Bellisimo Y, 2006, The effectiveness of problem-based instruction: a comparative study of instructional methods and student characteristics. *Interdiscip J Problem-Based Learn* 1(2):49–69.

Merrit, J., Lee, M.Y., Rillero, P., Kinach, B.M., 2017, Problem-Based Learning in K-8 Mathematics and Science Education: A Literature Review, *Interdisciplinary Journal of Problem-Based Learning*. 11 (3).

Regulation of Education and Culture Minister Number 22 Year 2016 about Process Standard (*Standar Proses*) in Elementary and Secondary School.

Rusilowati, A, Binadja, A.

2009, *Mitigasi Bencana Alam Berbasis Pembelajaran Kebencanaan Alam Bervisi SETS Terintegrasi dalam beberapa Mata Pelajaran*. Laporan Penelitian Hibah. Semarang, Universitas Negeri Semarang

Tillman, D. 2013, Implication of Problem Based Learning (PBL) in Elementary Schools Upon the K-12 Engineering Education Pipeline, 120th ASEE Annual Conference & Exposition. June 23-26, 2013.

Wade, R., 2002, Beyond Expanding Horizons: New Curriculum Directions for Elementary Social Studies. *The Elementary School Journal*, 103 (2), 116-130.

Winataputra, U. S., 2008. Materi dan Pembelajaran IPS SD. Jakarta, Universitas Terbuka.