Effectiveness of Project Based Learning and Guided Inquiry to Improve Learning Achievement and Entrepreneurship in Blora, Indonesia

Ninditya Enggawati Hayuningtyas[1✉] , Tri Suminar[2] & Erni Suharini[3]

[1] Public Elementary School 1 Kalen, Blora, Jawa Tengah, Indonesia
[2] Non-formal Education, Universitas Negeri Semarang, Indonesia
[3] Geografi Education, Universitas Negeri Semarang, Indonesia

Article Info

Abstract

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Current education does not always deal with remembering and memorizing but it should be creative and innovative. This research aimed to compare the effectiveness between Project Based Learning (PjBL) and Guided Inquiry (GI) in improving learning achievement and entrepreneurship of fifth graders at primary school. This quantitative research used quasi experimental design. The experimental group was intervened by Project Based Learning while the control group by Guided Inquiry. The population of this research consisted of Gatot Subroto primary school cluster, Blora Municipal. The sample consisted of SDN 1 Kalen and SDN 2 Nglandeyan. From both schools, all fifth graders were taken by using saturated sampling. The techniques of collecting idea were test, questionnaire, observation, interview, and documentation. The hypothesis test used N-Gain and Independent Sample Test analysis. The findings showed that there were differences by using PjBL and GI in improving learning achievement with score of $t_{value} = 0.980$ with sig score 0.000. In improving entrepreneurship, the $t_{value} = 0.397$ with sig score 0.000. Thus, it could be concluded that Project Based Learning was more effective to improve learning achievement and entrepreneurship of the students than Guided Inquiry. It is suggested for the educators to be more creative in using appropriate learning model to the characteristics of the students and school should facilitate teacher to be more innovative.

✉ Correspondence address:
  Kalen RT. 03/ RW. 02, Kedungtuban, Blora, Jawa Tengah, 58381
  E-mail: nindityahayuningtyas@gmail.com

INTRODUCTION

Heading to 21st century education in Indonesia, it should change the mindset of its citizen to be developed and more advance. Global society demands human to be creative and critical, flexible, open – minded, innovative, skillful, competitive, sensitive to problems, to master information, and to work within a team across fields plus to adapt with the changes. According to Rusdin & Ali as explained by Mahabbati *et al.* (2019), they said that 21st century concerned with cognitive, interpersonal, and intrapersonal domain.

Education also has four elements: (a) learning to know, (b) learning to do, (c) learning to be expert, and (d) learning to live together. The first and second elements allow human to obtain knowledge and skill to live (Restiyanti, Sutarto, & Suminar, 2017). According to Howard *et al.* (2019), learning is a behavioral change as consequence of interaction between stimulus and responses. In another word, learning is changes experienced by students dealing with their skills to behave with new ways as result of interaction between stimulus and responses.

Reliable educators should conduct learning process as arrangement or experience guiding process continuously and emphasize students' participations in each activity (Muhtadi, 2009). Current learning paradigm has changed from teacher – centered learning into student – centered learning so it needs many innovation and creativities in learning (Rusilowati, 2012).

Project Based Learning (PjBL) is a complex learning task based on challenging questions or problems. It involves students to design, solve, decide, and investigates. It also provides opportunity for student to cooperate autonomously within lengthy period. Then, the final result will be real products or presentations (Kokotsaki, Menzies, & Wiggins, 2016). The students can develop their ability and instil their motivation as an approach to learn so that it influences their valuable skills to develop strong foundation to face their globalization challenges in the future (Bell, 2010).

Project Based Learning is an appropriate model for students because it is more affective and fun. It does not only deal with learning but it also lets students to get real experience (Hogue, Kapralos, & Desjardins, 2011). By having real experience and memorizing skill, students will be eased to improve their learning achievement (Wijanarko, Supardi, & Marwoto, 2017). As stated by (Surya, Stefanus & Relmasira, 2018), the implementation of PjBL could improve learning achievement and creativity of students. The achieved creativity in this research was about entrepreneurship, to let students obtain real experience based on current era development.

At primary school level where the students could not control a certain emotion in solving problem, it would require the teacher's role to guide the performance so that it could be in line with the purpose of the learning. Such guidance is called guided inquiry. It is a model which allows teachers to guide/direct students in solving a problem (Hmelo-Silver, Duncan, & Chinn, 2007).

Akhiruddin, Herawati & Susilo (2016) showed that there was improvement when guided inquiry was combined by PjBL. However, the difference between this research and the previous research was the investigated subjects. In this research the subjects were primary school student level.

Guided inquiry model lets teacher to share students about the taught materials. The direction could take form as questions to make them finding out the information by themselves or doing anything given by the teacher to solve the problems (Prastiwi & Haryani, 2018). This task could be done individually or collectively. Here, the students would not only be active but also they got the materials directly and created real experience which made their learning achievement improved. As stated by Salu (2019), guided inquiry could improve Science learning achievement.

To foster entrepreneurship of children is a way to make them having tough personality, independency, and financial quotient. The entrepreneurship values are important for students for their futures. Heretofore, students

only learned cognitively without any balance of cognitive, affective, and psychomotor (Wardani, Suharini, & Setiawan, 2019). Entrepreneurship which focuses on problems will develop creativity and kindness to surrounding (Rahman *et al.*, 2015).

This research aimed to find out effectiveness of Project Based Learning and Guided Inquiry in improving learning achievement and entrepreneurship of fifth graders of primary school.

METHODS

This quantitative research used quasi experimental design with pre-test – post-test control group. The experimental group was taught by Project Based Learning while the control group was taught by Guided Inquiry.

The population was taken from Gatot Subroto cluster of Blora municipal. The sample consisted of SDN 1 Kalen and SDN 2 Nglandeyan. From both schools, all fifth graders were taken as the sample by using saturated sampling. The data was collected by test, questionnaire, observation, interview, and documentation.

The obtained data was analyzed by SPSS 21 program for Windows and triangulated. The hypothesis test used N-Gain and Independent Sample Test analysis. The N-Gain test was used to find out the improvement of students' learning achievement and entrepreneurship while the independent sample test was used to find out whether the variance of learning achievement and entrepreneurship was significant between before and after intervention of problem based learning and guided inquiry.

RESULTS AND DISCUSSION

The Students' Learning Achievement

The data was obtained from the test of experimental group taught by using PjBL at SDN 1 Kalen while the control group taught by using GI at SDN 2 Nglandeyan.

The learning instruments were syllabus, lesson plan, worksheet, and handbook. The

development of the instruments used PjBL and GI stages to improve learning achievements of the students and to foster entrepreneurship.

It was determined the minimum passing grade criterion was 70. The numbers of experimental group students were 32 students. Among them, 3 students passed the score during pre-test. The numbers of the control group students were 32 students. Among them, 2 students passed the score during pre-test. Here is Figure 1 showing the detail percentage improvement of pre-test and post-test average scores.
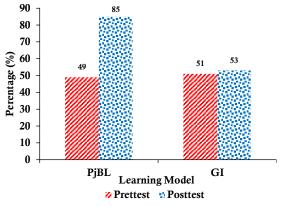

Figure 1. Average Score Comparison

The previous learning achievement for both groups were relatively similar. After the learning, the experimental group showed higher result than that of the control group. The pre-test score of experimental group was 49 while the control group was 51. The post-test of experimental group was 85 while the control group was 53.

The learning achievement of the experimental group is shown in detail in Table 1. Table 1 shows classical learning completeness. It reached 9% while the individual learning completeness reached 48%. There were 3 out of 32 students were considered reaching the passing grade. It could be said that there were 48% students reaching score ≥ 70 but lesser than 85%. It happened when they had not been taught by PjBL. Thus, by implementing PjBL, the learning achievement of the students improved because it was greater than 85%. It could be concluded that there was improvement from the pre-test to post-

test results. Thus, by implementing PjBL, the learning achievement of the students was improved because it was greater than 85% from the classical passing grade. Based on the scores of pre-test and post-test from the experimental group, the N-gain score was 69.323, meaning that the learning achievement was considered high.

Table 1. Analysis of Experimental Group Learning Achievement Test

Achievement aspects	Pre-test	Post-test
Highest Score	73	100
Loweest Score	20	62
Numbers of students	32	
Numbers of passing graded students	3	29
Numbers of fail students	29	3
Individual completeness percentage	48%	85%
Classical completeness percentage	9%	91%
Learning achievement average	49	85

Before the intervention, the experimental group and control group focuses on the teacher. Students were not given chance to find what they would find. They were just sitting down, seeing, and listening. After the intervention by using PjBL, the student had chance to practice by making ice puter so that they were active in learning and in a group. More details can be seen on the Figure 2.

learning did not only make them active but also improved their learning achievement.

On the control group, the teacher guided in some experiment until finish. The student were active but not independent since the teacher also solve the problem. More details can be seen on the Figure 3.

Figure 2. Making Ice Puter

Figure 3. Guided Inquiry Learning Process

After the intervention, they were asked to answer the post-test question. It was found the

In another hand, the learning achievement of control group is shown in Table 2.

Table 2. Analysis of Control Group's Learning Achievement Test

Achievement aspect	Pre-test	Post-test
Highest Score	87	89
Lowest Score	27	29
Numbers of students		32
Numbers of passing graded students	2	3
Numbers of fail students	30	29
Individual completeness percentage	51%	53%
Classical completeness percentage	6%	9%
Learning achievement average	51	53

The table shows that classical learning completeness reached 6% and the individual reached 51%. There were 2 out of 32 students were considered passing the grade. It could be said that there were 51% students having score ≥ 70 but lesser than 85%. It showed that before the intervention by using Guided Inquiry, the form of the research and discussion were not separated. It was due to.

The numbers of available pages for the writer were limited. After the learning, it was known the classical learning completeness reached 9% and the individual completeness reached 53%. There were 3 out of 32 students considered passing the grade. It could be said that there were 9% of the students having score ≥ 70, lesser than 85%. The learning improvement of the students based on pre-test and post-test scores of control group gained N-gain score 4.784. It meant the learning achievement was considered moderate.

The t-test showed $t_{value} > t_{table}$. It was 9.808 > 2.039. The significant score in Sig column (2-tailed) 0.000 < sig score 0.05 (%%). Based on the data analysis, it could be concluded that H_0 was denied and H_a was accepted. It meant there was difference between experimental and control group achievement.

The effectiveness test of both models to learning achievement quality could be seen on Table 3.

Table 3. Effectiveness Test Result of the Models (Learning Achievement)

Classical completeness test		Test of average variances	Percentage of n-gain test	
PjBL (Experimental group)	GI (Control group)		PjBL (Experimental group)	GI (Control group)
91%	9%	9.808	69.32	4.78

The table shows the effectiveness of control group was 4.78. It meant Guided inquiry was not effective to improve learning achievement of the students. Then, the N-gain score of experimental group was 29.32, meaning that it was effective in improving the learning achievement of the students.

Based on the N-gain calculation, then it could be concluded that Project Based Learning model was more effective to improve the learning achievement of the students than Guided Inquiry model used in control group.

Entrepreneurship

Entrepreneurship was measured by questionnaire which was distributed to both groups, the experimental group at SDN 1 Kalen taught by Project Based Learning and control group at SDN 2 Nglandeyan taught by Guided Inquiry. The result is shown on Table 4.

Table 4. Calculation of N – Gain Test of Entrepreneurship

Groups	Scores		g	Criteria
	Pre-test	Post-test		
PjBL	54.75	84.05	0.55	Moderate
GI	53.73	64.94	0.32	Poor

Based on the table, the pre-test and post-test scores of the experimental group showed average of N-gain score 0.55. It meant the entrepreneurship of the students was categorized moderate. In control group, the N-gain average score was 0.32, meaning that the students' entrepreneurships were categorized poor.

The t-test of entrepreneurship showed that $t_{value} > t_{table.}$ It was 3.972 > 2.039. The significant score in column of significance on Sig column was (2-tailed) 0.000 < sig score 0.05 (5%). Based on the data analysis, it could be stated that H_0 was denied and H_a was accepted. It meant there was difference between entrepreneurship of experimental and control groups.

The result of model effectiveness test was known that N – gain score of control group was 32.58, meaning that Guided Inquiry was not effective to improve entrepreneurship of the students. Then, the experimental group's N – gain test was 55.16, meaning that it was effective to improve entrepreneurship of the students.

Based on the test, it could be concluded that Project Based Learning was more effective to improve entrepreneurship of the students than Guided Inquiry model taught for control group.

According to Marini (2019) instilling entrepreneurship values at early age through project could be actually done. It has 11 entrepreneurship values: (1) independent, (2) creative, (3) brave to take risk, (4) action orientation, (5) leadership, (6) hard work,

(7) discipline, (8) responsibility, (9) cooperation, (10) curiosity, and (11) communicative.

Nurhabibah, Hidayat, & Mudiono (2018) compared Guided Inquiry to with conventional model to cognitive achievement of students. It was known that the achievement was similar. It proved that both models were effective. However, in this research, it proved that Guided Inquiry was different compared to Project Based Learning. Both models could improve learning achievement but PjBL was better than GI.

CONCLUSION

Based on the findings and discussion, it could be concluded that Project Based Learning was effective to improve learning achievement of the students and their entrepreneurship than Guided Inquiry for the fifth graders at Gatot Subroto cluster, Kedungtuban district.

Educator should be creative in utilizing appropriate model to charactersitics of the students and school should facilitate the teachers to be more innovative.

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